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### Business Advantage Delivered: The Cisco Unified Computing System

In Collaboration With





### Your business advantage depends on your ability to be more flexible, agile, and cost effective than your competitors.

Day-to-day business operations require a delicate balancing act. Competing directives put IT organizations under pressure to address real-time business needs and initiatives while providing more services to a rapidly expanding user community. Increasing demand on already burdened IT infrastructure constrains the flexibility and agility of the organization and makes running the business cost effectively a challenge.

Savvy IT managers recognize that improving operational efficiency requires a new approach. That is why many companies are moving away from individual server, network, and storage components to integrated systems. By viewing their data centers as a fully integrated and managed computing system, IT organizations can go beyond simple convergence and deliver the benefits of centralized, service-oriented data center infrastructure to their business users. This holistic approach addresses the top priorities 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 everchanging marketplace. These priorities include:

- · Improving time to value
- · Supporting priority initiatives
- Delivering business and operational results
- · Implementing analytics and big data
- Increasing efficiency

Traditional blade servers and virtualization solutions address some of these priorities, but they also create new problems for IT operations. The innovative and proven design of Cisco Unified Computing System<sup>™</sup> (Cisco UCS<sup>®</sup>) delivers cost efficiency, agility, and flexibility beyond what traditional blade and rack servers provide. By addressing the real problems that your IT managers and executives face, and solving them on a systemic level, Cisco UCS can help your IT organization reap the benefits of a simplified infrastructure.

### Cisco UCS

Cisco UCS with versatile Intel® Xeon® processors combines industry-standard x86-architecture blade and rack servers, networking, and enterprise-class management into a single system. It is programmable using unified, model-based management to simplify and accelerate the deployment of applications and services running in bare-metal, virtualized, and cloud-computing environments.



### Business Advantage Delivered: Faster Time to Value

### Deploy in Less Time with Fewer Steps

Cisco UCS blade servers can be deployed 77 percent faster and with 67 percent fewer steps than HP blade servers.

Migration of identities from server to server also takes less time. The process is 34 percent faster with Cisco UCS, with 83 percent fewer steps, than with HP servers.



Principled Technologies Reports from July 2013: "Migrate Server Identities and Data 34 Percent Faster with Cisco UCS and With 83 Percent Fewer Steps Than HP" and "Cisco UCS Blades Deploy 77 Percent Faster With 67 Percent Fewer Steps Than HP Blades."



#### Faster Time to Value

Cisco UCS enables faster time to value through greater time-on-task efficiency, easier scaling, and its fundamental design as a centrally managed, physically distributed virtual blade chassis.

#### Greater Time-on-Task Efficiency

Cisco UCS enables IT organizations to be more effective by reducing the amount of time spent on tactical, operational activities. An embedded, model-based management system allows your 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 your staff from tedious, repetitive, time-consuming chores that are often the source of errors that cause downtime, making the entire data center more flexible and cost effective. Greater time-on-task efficiency leaves more time to focus on making your businesses successful and more competitive in the marketplace.

#### **Easier Scaling**

Automation means rapid deployment, reduced opportunity cost, and better capital resource utilization. With Cisco UCS, blade, rack, and modular servers can move from the loading dock and into production in a "plug-and-play" operation. Blade and modular servers can be configured automatically using predefined policies simply by inserting the devices into an open blade chassis slot. Rack servers can be integrated into the deployment by connecting them to top-of-rack Cisco Nexus<sup>®</sup> fabric extenders or directly into the system's fabric interconnects. Because policies

### Business Advantage Delivered: Faster Time to Value

### Reduce Provisioning Times by 83 Percent

When we reviewed 99 of our customer case studies, we found that customers averaged 83 percent shorter provisioning times. One of our customers, Moffat & Nichol, found that the same staff of seven engineers who previously managed 90 servers now manages 150 servers.

(http://www.cisco.com/en/US/solutions/collateral/ns340/ ns517/ns224/moffatt\_nichol\_cs.pdf)

### Reduce Ongoing Administration and Management Costs by 66 Percent

When we reviewed 46 customer case studies that discussed administration and management cost savings, we found that customers experienced average savings of 66 percent. Andres Henderson, ING DIRECT Australia's chief information officer (CIO), reported, "Our staff can now provision a test environment in minutes, not months, so we can test new ideas very rapidly. It's given us a competitive edge."

(http://www.cisco.com/c/dam/en/us/solutions/collateral/datacenter-virtualization/ing\_cs.pdf)



make configuration automated and repeatable, configuring 100 new servers is as straightforward as configuring one server, delivering agile, cost-effective scaling.

#### Physically Distributed Virtual Blade Chassis

With separate IP, storage, and management networks and infrastructure for each chassis, traditional blade systems are functionally an accidental architecture based on an approach that compresses all the components of a typical rack–servers, switching, and management–into each and every chassis. Then the complexity is multiplied several times per rack, once for each chassis. 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 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 servers are joined into a single virtual blade chassis that is centrally managed yet physically distributed across multiple racks of blade chassis and rack servers. This large virtual chassis is enabled by Cisco<sup>®</sup> fabric interconnects that connect to every server or virtual machine through a single network hop. The fabric interconnects provide simplified networking, 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.

### Business Advantage Delivered: Greater Agility to Support Business Initiatives



### Fast Access to IT Agility

"The entire migration took just one day. People don't believe us, especially when considering such a migration very well could have taken at least two weeks with significant downtime."

Gary Leonard, Dynamic Data Center Consultant, Microsoft Partner Center

(http://www.cisco.com/c/dam/en/us/solutions/collateral/ switches/catalyst-6500-series-switches/mpsc\_cs.pdf)

# Application silos thwart attempts to uniformly manage cost and capacity in a logical and coherent manner.

#### Greater Agility to Support Business Initiatives

In the past, application silos were thought to be a good idea. However, they have failed in operation because they are overprovisioned by necessity, they impede resource sharing, and they limit flexibility and agility. As a result, they reduce 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 handle any application workload in minutes.

#### Breaking Down Silos for Improved Collaboration

Cisco UCS is intelligent infrastructure that is designed to eliminate the walls between computing silos and run any workload on any server. The system is designed as a flexible pool of computing, networking, 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.

### Business Advantage Delivered: Greater Agility to Support Business Initiatives

### Lower Infrastructure Cost per Server

Server costs are significant, but so is the cost of the infrastructure to support each server. SingleConnect technology dramatically reduces the number of interfaces, cables, and switches needed to support Cisco UCS blade servers. The result is an average perserver infrastructure cost for 96 servers of US\$2194 for Cisco UCS compared to US\$4316 for an HP system with HP OneView\* and US\$4809 for a Lenovo system with Lenovo Flex System Manager, more than double the cost of Cisco UCS.



\*Based on the Cisco UCS manufacturer's suggested retail price (MSRP) and HP and Lenovo retail price on May 21, 2014.

#### Increased Visibility and Control

IT administrators and managers must be able to see and control their computing environments, whether physical or virtual. This level of insight requires virtual machines that are equivalent to physical servers and tight integration with leading hypervisors. Cisco's approach results in lower operating costs, increased security, and less chance of errors that can cause application downtime. The result is:

- · Visibility and control over virtualized environments
- Deterministic network performance regardless of physical location
- Improved network throughput
- · More flexibility to manage workloads
- · Increased compliance with security requirements

#### Lower Cost of Scaling

The system is interconnected with Cisco SingleConnect technology, an easy, intelligent, and efficient means of connecting and managing computing in the data center. This technology integrates rack and blade servers; physical servers and virtual machines; and LAN, SAN, and management networks, all through a single set of cables for increased performance, security, and manageability.

SingleConnect technology uses low-cost, low-energyconsuming fabric extenders to bring the system's data and management planes directly to blade and rack servers without the need to add new actively managed devices every time you add more servers. SingleConnect technology brings up to 160 Gbps of network, storage, and management bandwidth to each blade chassis, and up to 80 Gbps of bandwidth to each rack server. Shared network resources provide the agility to share bandwidth rather than having to rigidly partition it between Ethernet and Fibre Channel networks. Add to these benefits the benefits of fewer components and better performance, and you get a lower-cost, more incremental, and more graceful scaling model.

#### Visibility at Scale

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

#### Mobility with Control

Intel FlexMigration technology enables virtual machine mobility across multiple generations of processors. Cisco virtual interface cards (VICs), in conjunction with Cisco Data Center Virtual Machine Fabric Extender (VM-FEX) technology, connect virtual network interface cards (vNICs) 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 and cost-effective environment.

#### **On-Demand Resource Allocation**

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

With Cisco UCS, every detail of a server's configuration and its network connectivity is encapsulated in a Cisco UCS service profile. Applying a service profile to a server configures it to a known state that complies with predefined organizational standards. Cisco UCS service profiles make migration of workloads between servers with different capacities straightforward. Spare capacity can be allocated on demand, reducing the time and cost associated with burst capacity and disasterrecovery resources.

### Business Advantage Delivered: Performance Without Compromise

### Business Performance Advantage

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.



With versatile Intel Xeon processors, Cisco UCS continues its industry leadership, capturing 100 world performance records with firstto-market results or results that exceed those set

by other system vendors as of the date of disclosure. These results illustrate just how effectively Cisco UCS makes the raw power of Intel Xeon processors available for better application and business performance.



Cisco delivers performance at multiple levels, beginning by unleashing more power from Intel Xeon processors.



### IT as a strategic partner in the business versus IT as a cost center: the difference is the capability to match performance to business initiatives.

#### Performance Without Compromise

Cisco UCS servers use the latest Intel Xeon processors and an architecture that offers the flexibility to easily size workloads to meet the needs of specific applications. Cisco offers 2- and 4-socket servers in both blade and rack-mount form factors with processors with up to 18 cores per socket. Cisco UCS performance in part is the result of the efficient airflow design that allows Intel Turbo Boost technology to raise processor clock rates without reaching thermal limits.

This approach has led to record-setting benchmarks running mission-critical, enterprise-class applications on baremetal servers, with workloads including Oracle E-Business Suite, Java application servers, databases, virtualization and cloud computing, and high-performance computing. This industry-leading performance enables organizations to move from servers based on costly, proprietary RISC processors to Cisco UCS servers using industry-standard x86architecture for superior performance and business economics.

### Business Advantage Delivered: Manageable Virtual Environments

### 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/c/dam/en/us/products/collateral/ switches/nexus-5000-series-switches/case\_study\_c36-580410.pdf)



### For many, managing virtual infrastructure and getting it to perform is an art and not a science.

#### Manageable Virtual Environments

Virtualization has incrementally improved the flexibility and cost structure of data centers, while creating new problems for IT organizations. Virtual machines are easy to create, but in traditional environments they can be lost in sprawl or multiple layers of management. This complexity obscures performance problems and makes management an ever-increasing challenge.

**Cost-Effective Virtual Infrastructure Performance** The cost of data center space is 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 requires the organization to make 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 more guest operating system memory with a smaller number of servers. Cisco's high-density design increases consolidation ratios so that you can run more workloads on fewer, smaller systems. This technology optimizes the cost of delivering virtual machine computing capacity and is particularly effective in increasing return on investment (ROI) for virtual desktop environments and for single-application-instance servers that require large memory footprints. Virtual Desktop Infrastructure Performance Although many enterprises are increasingly turning to desktop virtualization to gain increased business agility, risk mitigation, and support for bring-your-own-device (BYOD) initiatives, many organizations quickly realize that the success of virtual desktop infrastructure (VDI) as demonstrated in a small pilot deployment does not readily extend to a full-scale production environment.

Cisco UCS is changing the economics and performance metrics of server-hosted client computing, delivering a robust, high-performance computing fabric on which desktop virtualization can be deployed. In addition, the Cisco UCS storage accelerator provides an excellent server caching solution for delivering uncompromised I/O to support a specified number of users at lower cost and with more predictable performance than SAN-based infrastructure. With these technology advancements, your VDI administrators can linearly scale the number of supported users and deliver consistent performance for hundreds to tens of thousands of users.

High-Performance Virtualization for Applications Cisco UCS excels in virtual environments. Proving this fact are four years of performance records on the VMware VMmark benchmarks, which measure virtualization and cloud-computing performance. The records are the result of the Cisco UCS design, which packs tremendous computing power, memory, network, and I/O bandwidth into a small space while boosting the performance of virtualized environments. Cisco VICs in combination with Intel VT-d technology improve network throughput by up to 37 percent while freeing CPU cycles to deliver greater application performance.

### Business Advantage Delivered: Cisco UCS for Analytics and Big Data

### SAP Application Performance

"The performance of SAP applications on Cisco UCS was incredible, even better than we were getting on our existing environments."

Steve Houser, CTO, Xerox Cloud Services, Xerox

(http://www.cisco.com/c/dam/en/us/solutions/collateral/ switches/catalyst-6500-series-switches/Xerox\_external\_ case\_study\_final\_11\_02\_12.pdf)

### Faster Analysis

"Now that we're using SAP HANA on Cisco UCS, we have gone from analyzing millions of records in hours to the flexibility of analyzing hundreds of millions of records in seconds."

Santiago José Reig Lamberti, Head of Business Intelligence B2B, TUI Travel Accommodation and Destinations

(http://www.cisco.com/c/dam/en/us/solutions/collateral/ switches/catalyst-6500-series-switches/tui\_external\_ casestudy\_fnl\_10\_25\_12.pdf)



Easy scaling of computing and storage capacity can mean the difference between real-time insight and missed opportunities.

## Cisco UCS shortens the time from raw data analysis to business decisions

#### Cisco UCS for Analytics and Big Data

With Cisco technology, your data center can handle the most complex workloads. Big data clusters supported by hundreds of servers and petabytes of storage allow your IT organization to scale solutions to meet big data demands. Up to 160 Cisco UCS servers are supported in a single switching domain, and you can add Cisco UCS Central Software to connect up to 10,000 servers across a single data center, campus, or multiple data centers worldwide.

#### Cisco UCS Integrated Infrastructure for Big Data

Cisco UCS Integrated Infrastructure for Big Data extends the strengths of Cisco UCS by offering computing and network scalability, performance, management, and monitoring that yields essential operation simplification, modularity, risk reduction, and lower total cost of ownership (TCO). Integral Cisco UCS fabric interconnects offer a single connectivity and management plane for scale-out designs using both single-rack and multiple-rack form factors. Cisco UCS VICs enable the unified fabric for single-wire management and direct SAN access. When applied

### Business Advantage Delivered: Cisco UCS for Analytics and Big Data

### High-Performance Virtual SAP Landscapes

Cisco UCS gives organizations the same flexibility to virtualize their SAP landscapes that they have for less critical applications.

Cisco's virtualized SAP Sales and Distribution (SD) benchmark result demonstrates the benefits of a solution that uses the innovative Cisco UCS platform, open-source operating systems, and SAP Adaptive Server Enterprise. The solution recorded the best two-way virtualized SAP SD benchmark result on SAP Enhancement Package 5 for SAP ERP 6.0 and Sybase ASE 15.7. In the test, 5530 SAP SD benchmark users were supported while a consistent application response of less than one second was maintained.

(http://www.cisco.com/c/dam/en/us/products/collateral/ switches/nexus-7000-series-switches/le\_38602\_pb\_sapvirt. pdf)



to big data workloads, the architecture yields compelling performance advantages and significantly lower operating costs for companies across industries such as finance, healthcare, insurance, and government.

#### More Insight in Less Time

Innovations in Cisco UCS down to the applicationspecific integrated circuit (ASIC) level deliver excellent big data performance. These innovations can help you:

- Run big data and analytic applications more effectively and more quickly across the entire fabric at the core of Cisco UCS
- Accelerate the flow of information to your decisionmaking processes with big data operations in the same system as your business application infrastructure
- Analyze information more quickly by using more

servers and distributing data-loading and analysis tasks to take advantage of massively parallel processing

 Achieve more performance with your big data implementations with the balanced resources of Cisco UCS: high-performance processing, impressive I/O bandwidth, and large memory capacities

#### Faster Transactions and Analysis

Databases play an important role in support of business applications. When these environments do not perform well, the capability to rapidly store and process transactions and intelligently analyze information is impeded. Query responses must be in the subsecond range if your business is to be capable of real-time operational analysis that supports accurate business decisions.

### Business Advantage Delivered: Easier IT Management

### Increase Management Efficiency

Company	Time and Cost Savings
AudienceView	60 minutes to deploy a server, reduced from 1.5 days
CEIA	Nearly 100% improvement in server deployment times
EarthLink	1 night to perform a firmware upgrade, reduced from several days
Eclipse Aerospace	3 racks for IT infrastructure, reduced from 3 rooms
NetApp	10,000 virtual machines deployed in less than 1 hour
Plazamedia	50% faster decommissioning of servers
RUN AG	80% faster provisioning times
ConnectEDU	35% reduction in monthly data center costs
Indianapolis Public Schools	US\$2 million saved in licensing fees
Loughborough University	227% ROI
Microsoft	66% reduction in power use
Oak Hills	67% reduction in desktop TCO
Tele Sistemi Ferroviari	25% savings in new server provisioning costs
Xerox	20% improvement in staff productivity



## Simplifying routine tasks is one way to reduce the costs and complexity that result in lost opportunities.

#### Easier IT Management

Many IT organizations find data center infrastructure difficult to manage. Typically, administrators use a variety of element managers to interact with dozens of management touch points that are distributed across multiple servers, blade chassis, racks, and networking and storage resources. Unfortunately, most vendors attempt to solve this management challenge by introducing additional layers of management tools that lack self-discovery and create more work for administrators.

#### Automation That Simplifies Data Center Infrastructure Management

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 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.

### Business Advantage Delivered: Easier IT 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. (<u>http://www.cisco.com/</u> web/KR/products/PDF/8.cisco\_ucs\_areal\_world\_tco\_analysis pdf) System Deployment, Visibility, and Control

Cisco UCS uses model-based management to provision servers automatically, regardless of form factor. By simply associating a model with a resource through Cisco UCS Manager, your IT staff can consistently align policy, server personality, and workloads. These policies can be created once and used by IT staff with any level of experience to deploy servers. The result is improved productivity and compliance, greater availability, and lower risk of failures due to inconsistent configuration.

Easy Configuration That Simplifies Repurposing 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. Cisco UCS service profiles configure complete systems, from firmware revisions and BIOS settings to network profiles, with click-of-the-mouse simplicity. Your IT staff simply assigns service profiles and let the system's automated configuration do the rest.



### Global Management of Multiple Cisco UCS Deployments

When you deploy Cisco UCS in multiple data centers locally or worldwide, Cisco UCS Central Software helps you maintain policy-based management across all your systems regardless of where they physically reside. Cisco UCS Central Software manages multiple domains using the same concepts as Cisco UCS Manager uses to manage and control a single domain. A global inventory of components is maintained, regardless of location, giving you a straightforward means of maintaining policy-based control of your resources on a global scale. With a wide span of control, your IT staff can power down servers that are underutilized, map workloads to the right servers for more effective utilization, and meet service-level agreements (SLAs) with ease.

Application Deployment and Storage Management As your data center infrastructure expands, you can benefit from tools that provide comprehensive integrated infrastructure orchestration and management. Optional Cisco UCS Director broadens the management domain beyond Cisco UCS to incorporate computing, networking, and third-party storage systems. It helps IT organizations deliver IT infrastructure as a service through a single interface with point-and-click simplicity. A self-service portal lets your administrators and trusted clients quickly request and receive the physical or virtual infrastructure they need. Like Cisco UCS Manager, Cisco UCS Director is role and policy based, implementing the workflows that your network, storage, server, and virtualization administrators define together. Your business can achieve faster time to revenue with automated workflows, improved consistency and compliance, and better alignment with the business. In addition, you can reduce your need for outside resources and increase collaboration among subjectmatter experts.

### Business Advantage Delivered: Easier IT Management

### Cisco SingleConnect Technology Yields Massive Complexity Reduction

Traditional rack and blade server environments use separate infrastructure for IP, storage, and management networks, resulting in a massive number of cables, I/O interfaces, and upstream switch ports to support the servers.

Consider what is needed to support 64 servers. Cisco has a single point of management. HP BladeSystem has 16 managed components. IBM Flex System has 21 managed components. Which approach gives you more IT agility?





#### Greater Density

With Cisco UCS, servers, networking, storage, and management work together in a self-aware and self-integrating system. This design delivers greater computing density, virtualization, and network simplicity in a smaller footprint that reduces operating costs. For example, with the combination of powerful Intel Xeon processors, some of the largest memory capacities available in blade servers, solid-state memory-powered acceleration, and up to 160 Gbps of I/O bandwidth per server, Cisco UCS delivers enhanced performance and makes optimal use of limited space.

#### Fewer Management Points

The number of components and management points correlates to operating costs. Cisco UCS reduces the number of components, cables, and management points, reducing TCO. The system implements a radically simplified architecture that eliminates the multiple redundant devices and management points that are typical of traditional systems, reducing both capital and operating cost. Even the latest offerings from HP and IBM populate blade chassis with multiple network switches and chassis management modules. Their racks are configured with two or more top-of-rack switches for each network: LAN, SAN, and management. In contrast, Cisco UCS consists of a redundant pair of fabric interconnects that provide a single point of management and connectivity for the entire system.

### Business Advantage Delivered: More Efficient Operation

### 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-deployscisco-unified-computing-system-and-cloud-infrastructurenasdaq-csco-1507480.htm)

### When servers are static resources, you have less flexibility in the use of capital resources.

#### More Efficient Operation

In Cisco UCS, servers are dynamic resources that can be applied to meet any workload challenge at any time. Your IT organization thus can redeploy existing servers for less mission-critical tasks as the newest generation of servers is phased in to provide the 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.

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 computing resources, your administrators immediately know which servers are available and best match application workload requirements—and 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 UCS service profile templates support your existing organizational structures by combining role-based access with policy-based management within a single unified management tool, rather than aggregations of traditional element managers. This approach increases operational efficiency and shortens the time to production. This benefit does more than increase capital utilization; it significantly reduces the opportunity cost of long deployment times so your business can be 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. If your IT organization implements ITIL processes, you can use the API to populate a configuration management database (CMDB) automatically, eliminating the most difficult barrier to adopting ITIL processes: human error.



### Business Advantage Delivered: Improved Environmental Factors

## Power and Cooling Efficiency

True power and cooling savings come from new generations of silicon, architectural differences, and increased utilization. Cisco UCS was designed with these factors in mind to increase energy efficiency. Testing results show that Cisco UCS has better performance and more power efficiency than HP, IBM, and Dell solutions, with power savings that increase as the solution scales. For an 8-blade configuration, Cisco UCS demonstrated 10 to 18.7 percent greater performance-to-power ratios than equivalent servers—and the power savings can exceed 2 kW for a 160-blade solution.



#### For details see <u>Cisco UCS Power Efficiency Beats HP, IBM, and</u> <u>Dell Solutions</u>, March 2014.

SPEC Fair Use Rule disclosure: At 100 percent target load, the Cisco UCS 5018 blade chassis with eight Cisco UCS B200 M3 servers installed achieved 11,252,295 ssig\_ops using 2311W, HP BladeSystem c7000 enclosure with eight HP BL460c Gen8 servers installed achieved 11,349,890 ssj\_ops using 2661W, IBM Flex System Enterprise Chassis with eight IBM x240 computing nodes installed achieved 11,173,554 ssj\_ops using 2456W, and Dell PowerEdge M1000e blade enclosure with eight Dell M620 G12 servers installed achieved 11,269,813 ssj\_ops using 2605W. SPEC and SPECpower are registered trademarks of Standard Performance Evaluation Corporation.



## Your business can do more within the confines of existing space, power, and cooling resources.

#### Improved Environmental Factors

Better use of data center space, smaller square footage requirements, and improved environmental factors give companies room to grow where there was none before. 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. SingleConnect technology eliminates blade server- and hypervisor-based software switches, reducing capital and operating costs while freeing CPU cycles for better application performance.

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. The use of fewer active components reduces power consumption. The use of fewer cables reduces the amount of copper and fiber 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

When your business spends most of its administrative costs just to keep IT infrastructure running, you have little time left for innovation. These constraints do not just hold back your business; they also undermine morale because they prevent your workforce from delivering new solutions that add business value.

With Cisco UCS powered by Intel Xeon processors, your business can reap the benefits of a simplified infrastructure. Whether your IT organization needs to consolidate operations on fewer servers, virtualize infrastructure for greater flexibility, or support nextgeneration workloads such as big data, Cisco UCS can help you create more effective IT infrastructure that is easier to manage and costs less to operate. With the time and money saved, your IT staff can refocus its efforts on IT initiatives that support dynamic business priorities.

Although every business can benefit from increased agility, companies that need to be close to new markets in particular need exceptional levels of visibility. By deploying Cisco UCS and taking advantage of global management capabilities, you gain the flexibility to explore new markets without the need to radically change or invest in infrastructure. You can deploy and repurpose your IT infrastructure on a moment's notice, while maintaining control over policy, security, and compliance characteristics to help ensure safe operation.

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

For more information about Cisco UCS, visit <u>http://www.cisco.com/go/ucs</u>.

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