

Restore the IT Innovation Engine with Cisco Unified Data Center

Cisco Unified Data Center Redefines Data Center Economics and Reallocates IT Resources for Strategic Advantage

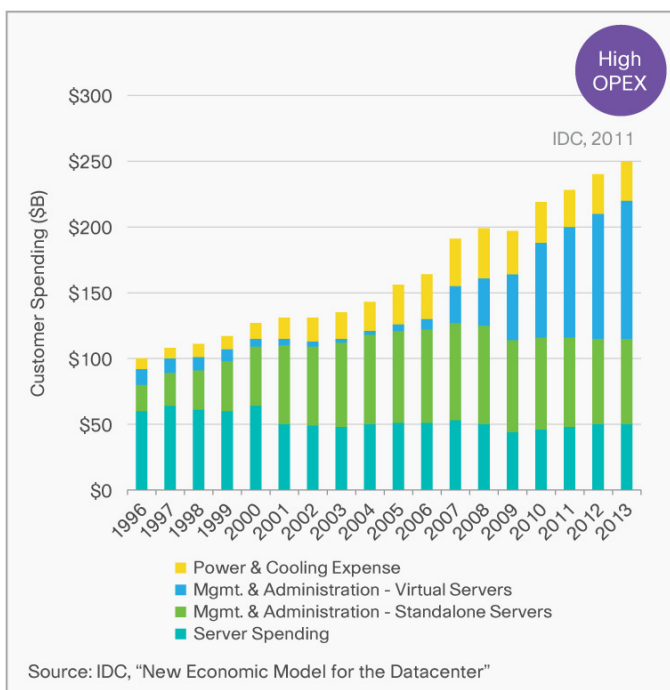
The success of any organization - large manufacturing enterprises, mid-sized businesses, public-sector agencies serving constituents, and more - depends on the speed and efficiency with which it can deliver innovation. Whether it is innovation in product quality or service convenience or reengineered operations that lower costs, the first organization to enter a market or to make a process improvement erects barriers to the success of those who follow later. In short, it pays to be first.

Most organizations rely on their IT infrastructure to act as their innovation engine. Over time, however, IT costs have risen, and the time required for IT to deliver innovation has continued to increase. With up to 75 percent of IT budgets dedicated solely to maintaining existing applications and infrastructure, the IT innovation engine has seemed to be slowing down.

Escalating Data Center Costs

Many of the root causes of the growth in IT spending have arisen from the data center, which has traditionally accounted for 44 percent of overall IT spending (IDC, "Game Changing Virtual Technology"; see Figure 1).

Figure 1. Server-Related Spending (Capital Expenditures [CapEx] and Operating Expenses [OpEx])



Worldwide Spending on Servers, Power, and Cooling and Management and Administration (US\$)

In addition to the inefficiencies caused by a siloed infrastructure within the data center, more than 50 percent of the cost comes from the combination of people and software, with the energy and facilities to operate and house the existing IT investment representing the next largest segment.

In addition, although virtualization and consolidation promised to reduce IT expenses, initial implementations came with hidden costs. Increases in server utilization were not accompanied by an overall reduction in costs, because management expenses also increased. This growth in expenses can be traced to the traditional approach to management in so many IT departments: because a wide variety of traditional servers, software, networks, and storage resources have been implemented in silos, data center management has become highly complex and rigid because it is attempting to integrate solutions that were never designed to work together.

As virtualization began to scale, with increasing movement of virtual machines within and between data centers, it became essential to help ensure that critical management information and security policies moved with the virtual machines. Without a simpler, more holistic approach to management, data center administration costs continued to escalate.

Changing Data Center Requirements

With increased rates of virtualization and implementation of private clouds, IT departments have the opportunity to make the vision of IT as a service (ITaaS) a reality. Instead of building dedicated, siloed infrastructure for every project, they can use pools of resources that are easily managed and delivered to the user. This approach requires an infrastructure specifically designed to be simple, agile, and efficient. In addition, instead of focusing on incremental reductions in the costs of one infrastructure silo or another, IT departments require a data center architecture that will result in savings across the entire infrastructure - computing, networking, storage, management, and applications resources - while simultaneously generating significant efficiencies in the cross-organizational processes required to manage these resources and consume the services they deliver. Only this form of infrastructure can restore the power of the IT innovation engine.

Because this type of infrastructure uses a holistic approach, IT has the potential to fundamentally change the economics of the data center, the management of the applications that run in it, and the productivity of the staff that operates it, enabling dramatic and sustained cost reductions. This kind of data center can be designed to efficiently enable change, automating management and security and delivering ITaaS. Achieving this new level of efficiency will provide organizations with more time to quickly bring new initiatives to market and respond to market changes.

Cisco Unified Data Center

Cisco calls this holistic approach the unified data center. The Cisco[®] Unified Data Center platform is designed from the foundation to deliver networking, computing, storage, security, and management as a fabric-based infrastructure to help IT evolve to ITaaS. Consisting of three elements - Cisco Unified Fabric, Unified Computing, and Unified Management - the Cisco Unified Data Center is designed to dramatically simplify IT infrastructure, enable greater agility, and increase efficiency.

- The Cisco Unified Data Center architecture unifies and dynamically optimizes computing, storage, networking, and management resources, which can be securely and rapidly repurposed and managed on demand to meet the needs of different customers or applications. Through its secure, scalable network fabric, IT departments can deliver network infrastructure or network services across all types of applications: from applications delivered on physical servers, to applications delivered on virtualized

infrastructure, to applications delivered through a private cloud. Consequently, organizations will be able to deliver outstanding scalability, performance, and high availability across all their applications.

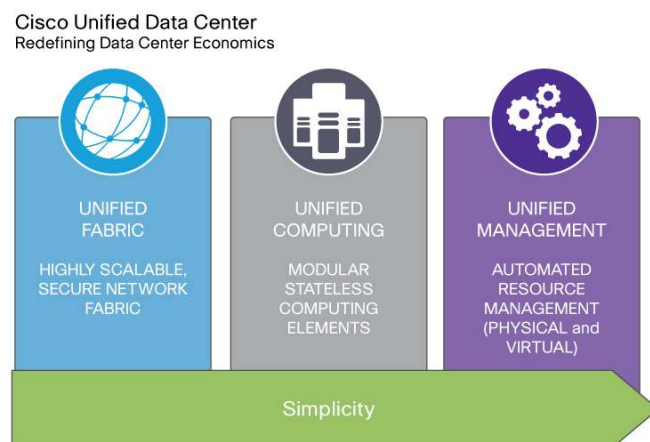
- Cisco uniquely unifies networking, storage, computing, and management resources into a fabric-based infrastructure that provides modular, self-integrating computing elements. The network no longer stops at the server; it extends into the server to the virtual machine itself. Through deep integration between the server environment and the network, management, transparency, and security are able to move with the virtual machine across the environment. The integration between the network and the data center enables both elements to work as one and delivers a high-quality experience within clouds, between clouds, and beyond the cloud.
- The Cisco Unified Data Center platform delivers automated provisioning and management of the shared fabric of computing, networking, and storage resources for the delivery of IT services within and between data centers. These new, simplified levels of automation help IT departments keep pace with rapid change and deliver new capabilities to the business.

It is Cisco's unique, unified approach that enables all these advantages. However, the three elements of the Cisco Unified Data Center do far more than promote efficiencies throughout the hardware, software, and networking resources that comprise the data center infrastructure. The integration of these best-in-class components has a cumulative effect on the enterprise and its operations by promoting pervasive IT simplicity, business agility, and financial efficiency, streamlining overarching organizational costs, improving productivity, and freeing resources that can instead be focused on innovation.

The Power of IT Simplicity: Streamlining Infrastructure Deployment and Management

In contrast to traditional data center architectures, the Cisco Unified Data Center makes it far simpler for IT departments to deploy virtualized technology in the network, storage, and servers; to manage that technology as it needs to change; and to facilitate access to the services that IT provides (Figure 2).

Figure 2. Cisco Unified Data Center Offers IT Simplicity



Here are three examples of the benefits of simplification:

Complexities of the Traditional Network Model: Two Networks Are Needed

Managing data center networks has been complicated by the power of two: two general data networks (Ethernet and Fibre Channel), two network types (core and access), and two network management organizations to manage

the networks and with which other organizations must coordinate. The duplication introduces complexities and inefficiencies that consume valuable resources, delay provisioning and necessary changes, and increase CapEx and OpEx.

Cisco Unified Data Center Benefit: Single, Converged, and Efficient Cisco Unified Network Model

In contrast, Cisco Unified Fabric within the Cisco Unified Data Center provides organizations with a significantly more efficient option: consolidate data center networks so they manage a single protocol for both their core and access networks, with one network management staff and one set of processes.

In addition, the Cisco Unified Data Center incorporates a unified approach to management of Fibre Channel and Ethernet networks through the use of Cisco Data Center Network Manager (DCNM). Cisco DCNM lets organizations manage their SANs (based on Cisco MDS 9000 Family products) and their Cisco Nexus® Family of switches and virtual Cisco Nexus 1000V Series Switches with a single-pane approach. Cisco DCNM further simplifies management through its capability to set policies and automatically provision them in converged LAN and SAN environments. It also proactively monitors performance and can perform path analytics for both physical and virtual machine environments.

Beyond significant costs reductions (described later in this document), the converged network infrastructure is inherently more reliable. Consolidation results in a reduced number of switches, distributed servers, and connections and decreases the problems of congestion and heterogeneous technologies. Network stability increases, and service disruptions decline.

Complexities of the Traditional Server Model: Deploy Again and Again

In traditional architectures, every server deployment is treated as a different instance. Making sure that a new server is connected to the network and storage and configured appropriately can take many hours. Whenever a change needs to be made to that configuration, it must be made using a manual or only partially automated process.

Cisco Unified Data Center Benefit: Deploy Once, Adapt Automatically

Simplifying data center operations and reducing the duration of tasks are two ways to control and decrease the operating costs of running a data center. The Cisco Unified Data Center is designed to simplify both initial deployment of resources and deployment of changes that may eventually be required. The use of Cisco Unified Computing System™ (Cisco UCS™) service profiles provides an excellent example.

Service profiles dramatically simplify the process of incorporating new servers into the unified data center so that they can be added to a resource pool in minutes, rather than in hours or days. Cisco UCS Manager configures and provisions every aspect of a server and its connectivity within the system with service profiles that fully specify a server and all its settings. A service profile can be used to provision a new server or, if necessary, provision a replica of the same server, so that an entire software stack can be moved from the original server to a replacement server completely transparently to the software and its licensing mechanisms. Cisco UCS Manager can be configured to discover new servers as they are added to Cisco UCS and automatically apply an appropriate service profile template depending on the physical characteristics of the server. This capability makes adding servers to different virtualization pools quick and easy. In addition, service profiles can be used to easily reconfigure servers so that they can be used in a different resource pool than the one in which they initially belonged.

“We decreased time to provision new server resources from 5 days to 20 minutes.”

- FFA Agricultural Education

Similarly, the wire-once capabilities in the unified fabric of Cisco Nexus switches and Cisco UCS are designed to simplify both deployment and ongoing changes. Within Cisco UCS, the unified fabric enables a wire-once deployment model in which chassis are cabled to the fabric interconnects just one time, and I/O configuration changes are performed through the management system, not by installing host adapters and recabling racks and switches. The unified fabric dramatically simplifies rack cabling by eliminating the need for multiple redundant Ethernet and Fibre Channel adapters in each server, separate cabling for access-layer switches, and separate switches for each network medium. Instead, all traffic is routed to the central server interconnects, where Ethernet and Fibre Channel then can be separated onto native, nonconsolidated networks. In addition, IT can make dynamic changes to the characteristics of the infrastructure - security, bandwidth, latency, etc. - without having to rewire. This simplicity becomes a very powerful advantage for the business and for IT, because the organization can rapidly and cost-effectively respond to changing requirements.

Traditional Infrastructure Management: It Is All About the Device

Historically, data center infrastructure has been built by a group of departments - server, storage, networking, and software teams - each responsible for selecting, deploying, and managing its own silo. Even within departments, there are often a broad range of types of technologies that have been deployed. For instance, storage departments may have deployed file-based, network-attached storage (NAS), and SAN-based storage and, within each storage category, may own systems from multiple vendors. Consequently, when maintaining its installed base, each department must address dedicated management systems that have been developed for each type of technology. Each of these different technologies, however, creates additional layers of management and inconsistencies in each silo, with lack of integration across silos. This scenario creates a complex maze that organizations must navigate to apply processes for day-to-day activities such as monitoring, logging, backing up, and managing capacity. In addition, this complexity slows operations dramatically when changes must occur, which they do with regularity, because every change must be aligned with the needs of the individual device.

Cisco Unified Data Center Benefit: Cisco's Platform Approach to Reduce Management Complexity in the Data Center

Instead of having multiple different types of management for server, storage, and network resources, the Cisco Unified Data Center radically simplifies the approach. Starting with the server platform, Cisco UCS has brought together a networked architecture for computing, consisting of both blades and rack servers, that is interconnected and managed as a common platform. Instead of having different server types, each with its own management system and interconnection to the network, Cisco UCS creates a common computing architecture in which resources can be dynamically allocated, moved, and changed depending on business requirements. This approach makes it easier to help ensure that all elements of the end-to-end infrastructure are highly available and optimized for performance, aligning the IT infrastructure with the needs of the business.

The Cisco Unified Data Center also extends these capabilities beyond the computing access part of the network to include the way that the infrastructure interconnects beyond the data center with the core and access networks. Whereas other solutions might have one network for Ethernet server connectivity and another for SAN connectivity, Cisco not only supports both, but extends the same operating system, Cisco NX-OS Software, through the core network, access network, and storage network, all the way to the server. Consequently, there is consistency in the processes used to both operate and manage them. For instance, far less interoperability testing and training is required than when IT staff has to manage different types of systems.

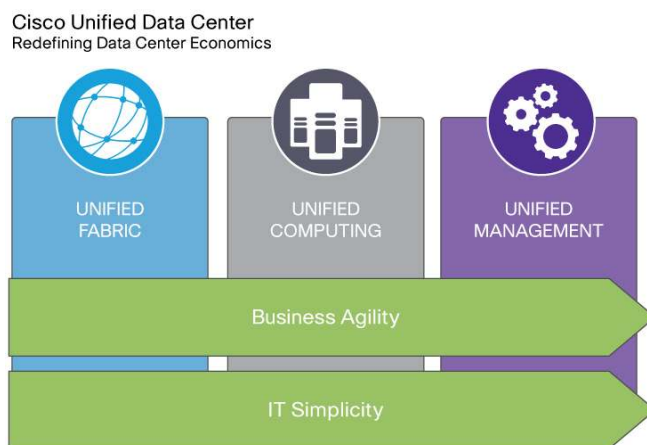
“Since we don’t have to redesign our infrastructure every time we integrate a new technology, we’ve been able to improve our deployment time by 33 percent.”

- Molina Healthcare

The Power of Business Agility: Mastering Change

Agility is the capability to respond to ever-changing business demands and a more mobile workforce while not disrupting other parts of the business. The simplified elements of the Cisco Unified Data Center provide consistency that becomes the cornerstone of infrastructure agility (Figure 3).

Figure 3. Cisco Unified Data Center Offers Business Agility



To be agile, you need to help ensure as much consistency as possible in technology, management, people, and processes. Although many people assume that consistency restricts your ability to be flexible, the two are inextricably related. Three types of consistency built into the Cisco Unified Data Center provide IT departments with a highly flexible foundation to address a wide variety of IT requirements:

- Consistency in infrastructure deployment: The consistent management and operations, delivered by the common Cisco NX-OS, Cisco DCNM, and Cisco UCS Manager enables your IT staff to apply the same processes and tests when implementing new infrastructure.
- Consistency in rolling out applications: Even though some application requests require rack-mount or blade servers or need specific configurations to achieve pricing advantages or specify different densities, common management and operations throughout the Cisco Unified Data Center allow IT to approach server deployment and application roll out in a consistent way.
- Consistency in infrastructure management: Consistency throughout the architecture allows organizations to deploy management activities such as security and load balancing across the entire infrastructure - servers, network, and storage - accelerating processes and increasing agility.

For organizations with siloed resources, addressing a needed change - for instance, by increasing data center capacity to respond to a peak in application demand - requires a piecemeal, siloed approach. In contrast, the Cisco Unified Data Center allows organizations to make holistic changes - for instance, by increasing capacity across the entire data center - quickly and efficiently.

Unleashing Business Agility: Applying Consistency Beyond a Single Data Center

When an organization begins to apply the power of this consistency beyond a single data center to multiple data centers connected by a cloud, the significant advantages in business agility become clear. Activities such as maintaining security and compliance, scaling capacity within the data center, accelerating disaster recovery, and dynamically adjusting workload resources become much easier using the common processes and automation that are fundamental features of the Cisco Unified Data Center.

- **Maintaining security and compliance with increased virtual machine mobility:** As the number of virtual machines and the need for virtual machine mobility increases, organizations need a consistent approach. Consistency helps ensure the security of those virtual machines and allows companies to meet compliance requirements related to data access, process tracking, and more. Cisco Unified Fabric provides a broad offering to address these challenges. The Cisco Nexus 1000V Series Switches deliver highly secure, multi-tenant services by adding virtualization intelligence to the data center network. These soft switches are integrated with VMware vCloud Director and are built to scale for cloud networks, with support for Virtual Extensible LAN (VXLAN) technology, which addresses the need for scalable LAN segmentation and helps enable broader virtual machine mobility. The Cisco Virtual Security Gateway (VSG) is integrated with the Cisco Nexus 1000V Series Switches and secures the virtualized infrastructure by providing trusted multi-tenant access with detailed zone-based security policies for virtual machines. Cisco VSG delivers security policies across multiple servers and supports virtual machine mobility across physical servers for workload balancing, availability, and scalability for business growth in cloud computing. Consequently, Cisco VSG strengthens compliance, simplifies audits, and lowers total cost of ownership (TCO) by helping virtualize more workloads. In addition, its vPath-based architecture delivers the benefits of security for fully virtualized data centers without sacrificing performance.

The addition of the Cisco ASA 1000V Cloud Firewall applies mainstream, proven Cisco Adaptive Security Appliance (ASA) technology to provide trusted security to multi-tenant virtual and cloud infrastructure at the network edge. When implemented with Cisco Nexus 1000V Series Switches, customers get consistent security across physical, virtual, and cloud infrastructure.

- **Supporting massive scalability in the network:** Virtualization delivers exceptional scalability to the data center, but it can be effective in a cloud environment only if the network between the data centers can scale as well. To complement the scalability enabled by virtualized data centers, modern networks must also become more agile and accommodate changes in a flexible way. Cisco accomplishes this through Cisco FabricPath, an innovation embedded in Cisco NX-OS Software that combines the simplicity of Layer 2 with the capabilities of Layer 3, without the downsides of spanning tree. Cisco FabricPath allows multiple paths between endpoints, increasing redundancy and enabling much larger Layer 2 domains. With Cisco FabricPath, workloads can be easily moved from blade to blade, frame to frame, and rack to rack without the difficulties of blocked links. Because traffic is no longer forwarded along a spanning tree, the bisectional bandwidth of the network is not limited, and massive scalability becomes possible.

“For Oracle, performance testing achieved improvements that were 2 to 20 times faster than previously, depending on the transaction.”

- EMC

- Increasing workload mobility and cloud performance: As customers deploy multiple geographically disparate data centers, they are looking for simplified network solutions to extend virtualization and cluster domains beyond a single data center to enable transparent workload mobility between data centers. This capability helps them get the most from computing resources across all data centers and helps ensure business continuity by geographically distributing applications and resources. Cisco provides industry-leading functions to address mobility challenges through Cisco Overlay Transport Virtualization (OTV) technology, VXLAN, and Cisco Location/ID Separation Protocol (LISP) innovations.
 - Cisco OTV: A critical network design requirement for deployment of distributed virtualization and cluster technologies is having all servers in the same Layer 2 VLAN. Meeting this requirement means extending VLANs over Layer 3 networks, but some current solutions have operational and resiliency challenges. To address these challenges, Cisco has implemented a new data center interconnect solution, Cisco OTV, on the Cisco Nexus 7000 Series Switches. Cisco OTV provides customers with an innovative yet simple means of extending Layer 2 networks over Layer 3 networks for both intra- and inter-data center applications without the operational complexities of existing interconnect solutions. Cisco OTV increases the utilization of all available bandwidth between data centers, helping deliver optimal bandwidth utilization, resiliency, and scalability.

“We’ve been able to reduce backup time from two hours to one hour, a 50 percent times savings.”

- Miami Children’s Hospital

- VXLAN: For organizations seeking to securely move workloads from data center to data center in multi-tenant environments, Cisco Unified Fabric includes a VXLAN solution. By enabling Layer 2 networking over Layer 3, VXLAN allows Layer 2 domains to be isolated from one another, while allowing them to be extended across Layer 3 boundaries. Consequently, workloads can be restarted in a new data center without the need to assign new IP addresses and while achieving better network separation.
- Cisco LISP: LISP offers the promise of addressing a scalability challenge in communications between data centers, giving organizations a solution to the problem of long routing tables and reconfiguration of routers. The current IP routing infrastructure is set up to use a single number to identify location and device identity. LISP allows the organization to use a central location to hold all the location information, removing the need for every router to know the entire routing table and eliminating the need to renumber IP addresses. Consequently, with LISP, when a virtual machine needs to move from one data center to another, it does not have to change its IP address, and the routers in the new data center do not have to be configured for the virtual machine’s IP subnet. Cisco is currently working with IETF to create a standard for LISP.

The Power of Financial Efficiency: Achieving Dramatic Reductions in Cost and Time-to-Market

The architectural shift in data center technology over the past several years has been revolutionary. In the not too distant past, the prevailing wisdom was that dedicated resources were best, and organizations built silos of server, storage, software, and network resources. This approach had two, large financial drawbacks. First, these silos were dedicated to different organizations or purposes. They were deliberately designed not to share. Consequently, utilization and technology return on investment (ROI) was low. Compounding that problem, organizations designed their infrastructure to handle peaks in processing requirements (for example, end-of-the-month billing and order entry and seasonal peaks for retail sales) so they would never have an outage. This practice was inherently inefficient, because most of the time those resources were not used.

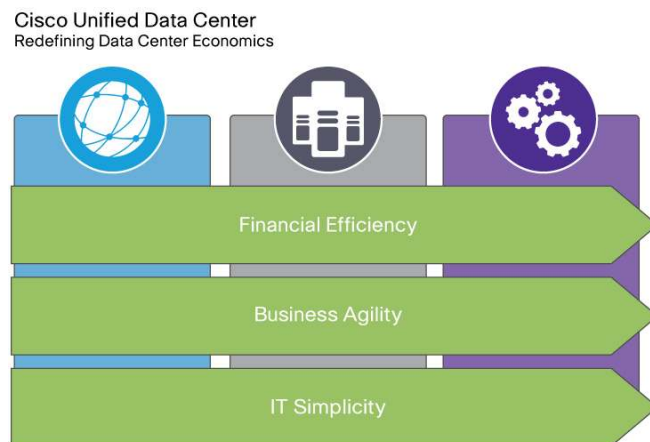
This overcapacity had a hidden opportunity cost as well. Human resources required to deploy and manage the rarely used infrastructure could have been spending that time on other, more strategic initiatives for the business.

Now the rules have changed dramatically. IT departments are trying to answer two main economic questions:

- How much can they increase utilization of technology resources by sharing them across departments and purposes?
- How can they reduce the percentage of IT staff time spent on infrastructure maintenance activities, so that IT can spend more time on strategic new initiatives?

The Cisco Unified Data Center can dramatically improve financial efficiency by addressing both these questions (Figure 4).

Figure 4. Cisco Unified Data Center Offers Financial Efficiency



Reducing Infrastructure TCO: Increasing the Efficiency of Virtualization

All aspects of the Cisco Unified Data Center are designed and optimized for virtualization, providing organizations with an excellent foundation for reducing CapEx and OpEx.

Cisco Unified Data Center TCO reduction starts with the advantages of innovative design in achieving efficient consolidation. Because Cisco Unified Fabric simplifies data center networking by allowing organizations to run a single common network infrastructure (instead of running both an Ethernet-based LAN and a SAN), this convergence delivers significant savings. In addition, unlike some Fibre Channel over Ethernet (FCoE) solutions, Cisco Unified Fabric allows organizations to achieve this efficiency across both the core and access networks, so customers typically attain a greater ROI.

Network consolidation savings from Cisco Unified Fabric build on one another, effect starting with significant reductions in capital costs through the elimination of redundant switches, cables, networking cards, and adapters. Reduction in the amount of physical equipment then results in savings in power and cooling costs. Reduction in the number of switches and servers also leads to reduced rack and floor space requirements. With fewer ports to manage and one less hardware platform on which to stay current, the IT department can reduce the number of staff members dedicated to the management of the separate networks and the number of storage and server team personnel required to address the complexity of the siloed approach. These people can instead be reallocated to more strategic tasks, which can increase job satisfaction and decrease staff turnover.

Cisco UCS industry-leading memory density and access speeds can help organizations increase virtual machine density, server utilization, and application performance, increasing the TCO savings associated with server virtualization. Because they need fewer servers, organizations can achieve savings in hardware costs and potentially in the cost of software licenses and hardware service as well. In addition, Cisco UCS and Cisco Unified Fabric are both designed to deliver greater energy efficiency and consume a significantly less data center space.

“[We achieved] a 70 percent savings in total power (kW) and cooling costs.”

- Travelport

“[We] achieved a six-fold increase in server utilization and lowered power consumption of its entire server estate by a third.”

- Cineca

Management efficiencies delivered by Cisco UCS Manager, the common Cisco NX-OS Software, and the Cisco Nexus 1000V Series also contribute significantly to productivity gains. With the addition of the benefits of streamlined and automated processes to CapEx and OpEx savings, many Cisco Unified Data Center customers are achieving TCO savings of up to 50 percent from virtualization efforts alone.

“Initial investment has been reduced by 58 percent, while maintenance costs have been reduced by 17 percent, and rack costs by 58 percent. The combined total reduction in TCO is over 50 percent.”

- NTT DATA

In addition, integration across silos and consistency across the platform facilitates the sharing of Cisco Unified Data Center resources, enhancing their capability to be used on demand. Virtualization intelligence throughout the infrastructure allows organizations to group workloads on a server when traffic is light, and to move workloads to another server when activity increases. Therefore, organizations can meet their peak requirements and optimize utilization during nonpeak times.

Calculating the Benefits of Application Management Efficiency

The productivity enhancements enabled by the Cisco Unified Data Center extend beyond the data center hardware and software infrastructure to improve productivity throughout the entire application management lifecycle.

- Deploying new applications: As mentioned earlier, by using the common Cisco NX-OS Software, organizations can use a consistent approach to providing network connectivity to applications, delivering bandwidth to provide the required scale and performance, and helping ensure management and security.
- Enhancing existing applications: Every time an organization needs to upgrade, patch, or back up an application, the productivity gains enabled by Cisco Unified Data Center add up. For instance, if an organization wants to upgrade an application to enhance its performance, the capability to virtualize the network and apply service profiles dynamically can greatly accelerate the process. The organization can develop a service profile for the current application, associate it with the current blade and network configurations, and apply it. Then the IT team can take that same service profile and assign it to a new blade in the Cisco Unified Computing System - with a new set of network parameters that provide it with more capacity, bandwidth, and resiliency - enabling the new, faster version of the application with faster infrastructure. With the Cisco Unified Data Center, this process is accomplished through software and takes minutes instead of hours or days.

“We calculated that operating 300 PeopleSoft servers on Cisco UCS costs 20 percent less.”

- NaviSite

- Establishing application backup and disaster recovery processes: To successfully move an application from its primary location to a disaster recovery location, IT must be able to provide it with the exact same environment in the backup location. With the consistency built into the Cisco Unified Data Center architecture, organizations can easily replicate the application's environment in a disaster recovery site. For instance, if IT wants to migrate a number of applications because an outage is expected, the Cisco Unified Data Center uses the intelligence in the network and service profiles to help ensure that the disaster recovery site exactly mirrors the original site, making the process of moving the applications in real time fast and easy.

"We slashed network outages, for cost savings of \$100,000 per month."

- Seven Corners

As an organization evaluates the benefits of productivity savings in each phase of application management, it is important to estimate how many times a year their employees engage in each activity. For many organizations, these productivity enhancements have resulted in hundreds of thousands of dollars in cost savings and reallocation of costly resources to more strategic initiatives.

"[We] increased time software engineers can devote to development from 50% to 80%."

- CareCore National

Increasing Efficiency Further: Delivering IT as a Service

Many believe that the best way to rebalance the economics in the data center is to enable and deliver ITaaS. If IT can move from its current methodology of addressing business needs with dedicated IT infrastructure to addressing them through more efficient, automated on-demand services, IT offerings can be more consistent, timely, and responsive to business needs. In this area, too, the Cisco Unified Data Center provides tremendous value. It integrates previously siloed resources and provides a consistent foundation to help organizations evolve their people, processes, and technologies so that they can deliver ITaaS.

Cisco Unified Management applies consistency to the provisioning of a broad range of resources, allowing IT departments to take a consistent approach to delivery of ITaaS for different departments throughout the business, making it far easier to set up and maintain IT resources on demand, and allowing users to get the IT services they need far more quickly than ever before.

ITaaS capabilities are achieved through the use of the automation features of Cisco Nexus 1000V Series Switches and Cisco UCS Manager in combination with the Cisco Intelligent Automation for Cloud self-service provisioning and orchestration software solution. Cisco Intelligent Automation for Cloud combines the functions of a self-service portal and service catalog with an orchestration engine for automated provisioning across computing, networking, storage, and application resources. Users can order what they need from a menu of standard options through an intuitive portal interface. IT can enable self-service provisioning of application and infrastructure requests within minutes, instead of weeks. Further, management can control and track each service, from initial request to decommissioning.

"Cisco's self-service cloud portal and automated orchestration help our customers roll out new IT capabilities faster while reducing the cost of their IT infrastructure."

- ACS

In addition, Cisco Unified Management includes Cisco Network Services Manager (NSM), a flexible, policy-directed approach to the management and control of cloud computing network services. Through a configuration user interface, Cisco NSM helps administrators dynamically define and control a variety of behaviors in the cloud computing environment, including:

- Creation of different levels of service capability, or service tiers, for tenant use
- Definition of the capabilities and resources available in each tier
- Design of a system containment structure tailored to tenant application and deployment model needs

Because Cisco NSM automates the deployment and management of network services, it dramatically reduces network operating costs and the potential for misconfiguration and accelerates service delivery.

Conclusion: Reallocating the Savings to Redefine Data Center Economics

When you calculate the economic value delivered by the increased IT simplicity, improved business agility, and greater financial efficiency of the Cisco Unified Data Center, you can see many tangible, quantifiable benefits. The innovation resulting from those benefits, however, is not as easily quantified.

As organizations move to cloud computing, Cisco Unified Data Center provides new sources of cost reduction and productivity enhancement at every stage. The cumulative effect of these benefits will change the next-generation data center cost model, with IT having significantly more control over CapEx, OpEx, and management expenses. This, however, is an incomplete assessment of the benefits of the Cisco Unified Data Center. The full benefits will be different for every organization that implements the Cisco Unified Data Center to revitalize the IT innovation engine, but they will be seen in the answers to these questions: What did the organization do with the money saved? Where did the organization use the talents of the additional human resources who were freed from tactical maintenance tasks? How did the organization benefit from the improved time-to-market for access to new resources?

At Cisco, we believe that the tangible cost savings and productivity enhancements are just a small portion of the benefits of the Cisco Unified Data Center. The larger impact of the Cisco Unified Data Center will come in the form of market firsts, product breakthroughs, and services that set their providers apart from the competition.

For More Information

<http://www.cisco.com/en/US/netsol/ns340/ns394/ns224/index.html>



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