

# Unified Data Center—Efficiency and Flexibility to Improve Business Agility

## What You Will Learn

This white paper addresses technical professionals who want to increase the efficiency and flexibility of their data center and are considering deployment of private cloud or delivery of IT as a service (ITaaS). Transforming the data center is a journey with predictable IT challenges along the way. This white paper summarizes what Cisco has learned from the transformation of our own data center and the experiences of our customers, and reviews the technology requirements of each stage along the journey. After reading this paper, you will have an understanding of how Cisco® Unified Data Center solutions can increase IT simplicity, create financial efficiencies, and increase the flexibility of your data center.

## Evolving Your Data Center Platform

The evolution to all forms of cloud computing – private, public, and hybrid – is being influenced by a combination of consumer behaviors and the ever-increasing pace of business. Consumers continue to demand more connected personal services online, from any location, at any time, and from any device. These same expectations and devices are being brought to the workplace with demands that IT organizations deliver infrastructure services in the same way. The combination of higher expectations and increasing overall demand for services is forcing IT to rethink how to deliver services to users internally and externally.

From a budgetary perspective, IT organizations feel increasing pressure to reduce overall IT costs. Initiatives that can simplify IT operations through consolidation, standardization, unification of platforms, and automation of the IT infrastructure offer the potential for tremendous cost savings. But that is only part of the equation. These same initiatives must also allow IT to be more nimble, allowing the business to launch new applications and services more quickly.

With traditional data center architecture, IT organizations often spend as much as 70–80 percent of their resources just maintaining the existing infrastructure. The advent of cloud computing promises to break this paradigm. The evolution to cloud computing and ITaaS can guide significant improvements in efficiency and agility, ultimately freeing IT resources from the burden of maintenance to focus more on delivering innovation.

This white paper will review the predictable stages that IT organizations follow as they transform their data centers, highlighting the typical obstacles that may threaten further progress. We will identify requirements to observe at each phase and demonstrate how Cisco solutions and best practices have helped businesses, large and small, overcome these obstacles.

## How Do You Know You Are Ready?

Most organizations make the decision to use a private cloud when they hit a crossroads triggered by early success with virtualization. They have reaped the cost savings in power, cooling, facilities, and licensing through virtualizing some portion of their servers. They have also improved their responsiveness to user requests. At this point, the organization asks for even greater cost savings and the expectations for fast turnaround increase.

That is when most IT organizations start to feel pressure. They have exhausted the early gains and efficiencies of virtualization, but virtualization is not yet the foundation of their approach. Virtualization requests are often treated as exceptions. As the number of exceptions increases, so does organizational friction because the processes and resources simply do not exist to take virtualization to the next level. Virtualization blurs the line between the traditional IT organization silos (storage, compute, networking, and applications), but the organizations are still structured independently of each other. They lack the tools to manage greater numbers of virtual machines or to automate the provisioning process. They are concerned about virtualizing their mission-critical applications.

Unfortunately, some organizations experience virtual machine stall at this point. The disadvantages of increasing virtualization may appear, in the short term, to outweigh the advantages, and the organization declines to invest further in virtualization. This, unfortunately, restricts their ability to move further toward delivery of ITaaS or fully leveraging the benefits of cloud computing.

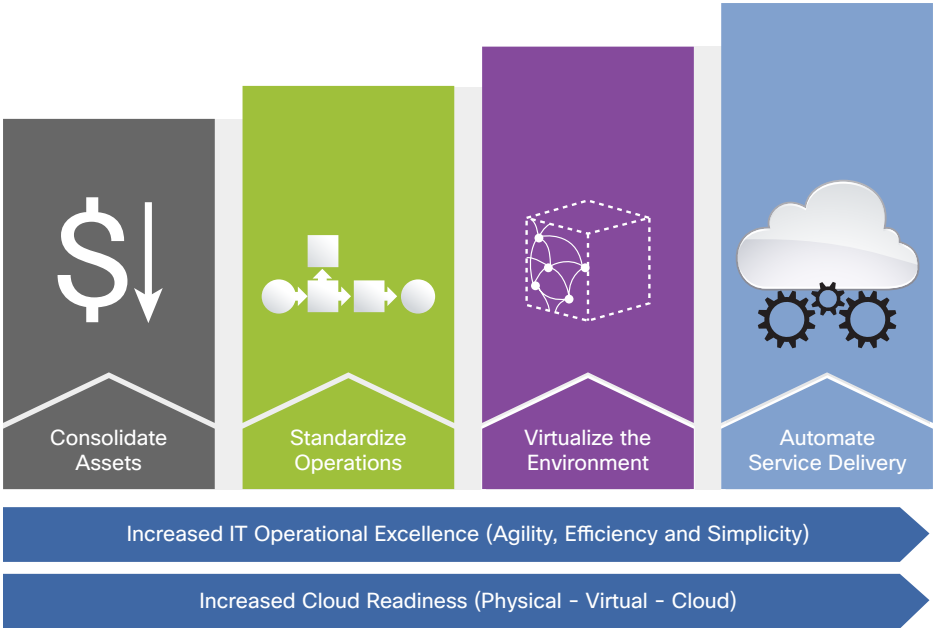
For other organizations, however, this phase is simply an inflection point. Either a virtualization advocate steps forward or an executive mandate is given that virtualization is no longer the exception and it will be the rule. The IT organization makes the conscious decision to expand virtualization and begin the transition to a private cloud. The destination for these companies is not just combining server and application virtualization in the data center, but using automation and intelligent networking to create IT infrastructure agility capable of driving business agility. For these organizations, IT is not viewed as a support function; it is a force of innovation that is critical in delivering competitive advantage.

### Requirements for Every Stage of the Journey

Getting to the point where IT is ready to deliver IT as a service (ITaaS) is a journey that includes multiple IT infrastructure initiatives, which may or may not happen in order, but are each important (See Figure 1). Each stage of the journey can provide financial advantages and business value.

At Cisco, we have seen that customers follow a predictable path on their journey to a private cloud, although the path can have many entrances and exits. There are four general stages that apply to most transitions: consolidation of assets, virtualization, standardizing operations, and automating service delivery. As the IT environment moves through these phases, it will become more efficient and agile, and therefore more ready to support cloud computing and ITaaS.

Figure 1. Journey to IT Delivered as a Service



## Objectives of Consolidation Phase

- Converge LAN and SAN infrastructure
- Unify network operations
- Reduce cabling
- Increase application bandwidth
- Facilitate dynamic quality of service

## Benefits of Consolidation: TASER International

- TASER's Virtual Systems division provides technology solutions for law enforcement
- Needed platform to host a cloud-based evidence management solution with the ability to provide outstanding responsiveness and user experience, scalability to manage exabytes of data (much of it video-based), and security to ensure data integrity and prevent unauthorized access
- Chose Cisco Unified Data Center solutions to increase operational agility and administrative efficiency, reducing capital expenditures by \$900,000 and saving \$37,000 in annual energy costs

As organizations better understand the benefits and potential of virtualized infrastructure, they can consider its use for mission-critical business application workloads. When implemented using standardized modular architectures, virtualization not only saves money, it also improves service levels for all workloads. As the data center approaches full virtualization, the business can realize significant cost and agility benefits by increasing automation levels and transitioning to a model that delivers IT as a service: a dynamic, scalable, secure infrastructure that is cost-efficient, easy to manage, and transforms IT from a perceived cost center to an enabler of the customer's business.

Four technology initiatives occur simultaneously to support the transformation of the data center. The first initiative is focused on **consolidation** and achieving cost savings by addressing inefficiencies in network, servers, and storage infrastructure. The second technology initiative focuses on pervasive **virtualization** of business applications and production environments, with improved business agility being the primary goal. The third initiative involves the **standardization** of technology and operational processes to increase predictability and efficiency and prepare for the final initiative – **automation** – which reduces the manual effort involved in operations to increase productivity and speed time-to-deployment, thereby allowing true delivery of IT as a service to internal and external customers. While the enhanced automation capabilities are truly the catalyst that ultimately frees IT resources from the tedium of maintenance tasks, efficiencies in the consolidation and pervasive virtualization stages can also influence greater levels of innovation for the business.

Knowing that data center transformation will ultimately provide your organization with increased efficiencies and business agility, it is pivotal to not view these four initiatives as completely independent, but as interconnected stages of a larger journey. The technology decisions you make at the consolidation phase can accelerate or impede your success at the virtualization and automation phases.

We will examine each of these technology initiatives, and highlight the challenges you will encounter, the primary requirements, and how to avoid obstacles with Cisco solutions designed specifically to facilitate your transition to cloud computing and delivering ITaaS.

## Consolidation

### Challenges and Requirements

In the consolidation phase, organizations are focused on reducing costs related to their IT infrastructure by promoting greater coordination and resource sharing within the data center. Unifying data center platforms and networks enables the organization to maximize the efficiency benefits of consolidation, while also making it easier to ensure the architecture continues to support compliance and secure multi-tenancy as workloads on virtual machines travel across data centers.

Existing data center architectures were built before virtualization, and are typically siloed in functionality. They were designed for individual applications. Consequently, they are characterized by multiple platforms running multiple operating systems, by large capital expenditures due to poor system utilization (because resources are isolated and unshared), and by highly inefficient power and cooling and complex management requirements.

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One of the first steps toward more efficient data center architecture is to consolidate and simplify. A successful consolidation strategy should focus on creating a unified foundation for LAN and SAN network traffic, a unified operating environment for computing and network services (such as firewall, load-balancing, intrusion detection), and encompass wide area application services for consolidating branch servers and storage. Consolidation of these aspects can enable high utilization, dynamic management, and a reduced footprint.

In traditional architectures, networks were typically defined by usage (e.g. data, storage, and telephony) and isolated from one another. Consequently, individual connection ports were required on every system and each network needed to be managed by a different team, resulting in a highly inefficient model.

Over time, convergence of data and communications into a single network helped improve network efficiency. Now, the capacity of 10-gigabit Ethernet, with eventual expansion to 40- and 100-gigabit, allows organizations to also converge the LAN and SAN traffic onto a unified data center fabric, helping to prepare for a consolidated private cloud architecture in which shared network services, supported by cross-functional staff, are the standard. This efficient, simplified, and shared architecture can better handle future applications.

In traditional environments, it was easy to ensure the separation of crucial applications and data to satisfy customer requirements and compliance rules, because they resided on separate servers. In a unified data center designed for resource sharing, you will need to ensure that your network has the intelligence and capability to associate unique security and quality of service (QoS) requirements, and other policies, with individual virtual machines, whether you are virtualizing applications on the same physical server or across multiple data centers.

#### **Cisco Innovations for Consolidation**

To consolidate your environment effectively and lay the best foundation for the evolution to a more efficient and flexible data center, you need a comprehensive set of innovative compute, network, and storage solutions designed to maximize the advantages of consolidation. Cisco delivers the essential infrastructure for greater coordination and data center resource sharing.

#### **Cisco Unified Fabric**

Cisco Unified Fabric is a single, flexible, and highly-scalable network infrastructure for your data center. Cisco Unified Fabric allows IT organizations to migrate from isolated Ethernet, LAN, and storage networks and consolidate around a single network OS and consolidated I/O with the intelligence to be virtual machine-aware and to support maximum virtual machine mobility and security. Cisco Unified Fabric provides a single point of connectivity and management across physical, virtual, and cloud resources, to dramatically lower management costs.

Cisco Unified Fabric provides:

- Architectural flexibility and scale
- Consolidated I/O
- Workload mobility
- Simplified management
- Virtual machine-aware networking

Intelligent network services differentiate Cisco's fabric-based platform from commodity infrastructure by ensuring that virtualized applications remain associated with the required availability, security, acceleration, workload balancing, and performance monitoring services. Unified network services ensure compliance and provide consistent service delivery using flexible, policy-based provisioning.

## Objectives of Virtualization Phase

- Virtualize network services
- Increase virtual machine density
- Increase virtual machine performance
- Promote virtual mobility: both intra- and inter-site

## Benefits of Virtualization: ExamWorks

- ExamWorks, nationwide provider of medical examinations and assessments, needed a data center infrastructure to provide centralized backups, disaster recovery, and the ability to comply with industry regulations.
- Chose Cisco to implement virtualization and build a private cloud to host business applications and virtual desktops in multiple locations, for the following benefits:
  - **Low resource requirements:** Two data center staff can support 450 desktops.
  - **Reduced capital expenditures:** UCS servers cost 66% less than traditional servers.
  - **Lower cabling and desktop costs:** ExamWorks expects to save \$333,000 annually.
  - **Reduced energy consumption:** Smaller footprint reduces energy consumption by at least 50 percent.

## Cisco Unified Computing System

Cisco Unified Computing System™ (UCS) is the first compute platform specifically designed for maximum consolidation and virtualization, to facilitate delivery of ITaaS and the migration to cloud computing. Unlike traditional architectures, Cisco UCS integrates compute, network, and storage resources into a single, highly-efficient, and simplified architecture. The resulting platform enables greater utilization of compute assets, is vastly simpler to manage and operate, and delivers far greater virtual machine performance and mobility.

Cisco UCS integrates compute, network, and virtualization to help enable significant capital and operating expenditure savings, pervasive virtualization, and the highest application performance and availability. Cisco UCS provides scalable and dynamic compute resources for open, virtualized, and non-virtualized environment and included an embedded management interface. More than 40 independent application and management solutions have been integrated through UCS open APIs.

## Pervasive Virtualization

### Challenges and Requirements

The goal of this stage is to systematically increase the percentage of the infrastructure that is virtualized, thereby increasing the number of applications per server or desktops per server to gain the greatest efficiencies. IT organizations progress along a learning curve as they try to improve their agility – rolling out new applications faster and offering new services that provide the benefits of the virtual infrastructure, like virtual desktop infrastructure (VDI). These organizations can increase the likelihood of success by leveraging pretested and proven processes to accelerate their results and mitigate risk.

Those organizations who suffer from virtual machine stall are often those that neglect to adapt or rethink their organizational practices to take advantage of the virtualized environment. To achieve pervasive virtualization, the virtualized data center must be designed to facilitate and not fight change. Consequently, IT organizations must put an emphasis on implementing solutions that provide ease of management and tight security.

### Cisco Innovations for Pervasive Virtualization

To achieve the greatest value from virtualization, including but not limited to efficiency, mobility, and simplified deployments, it is important to understand the multiple aspects of virtualization and how the infrastructure can enhance that functionality.

### Network Relevancy

The success of your efforts to deliver pervasive virtualization, the private cloud, or even hybrid cloud solutions, will depend on the performance, availability, and intelligence of the network that connects the elements within the data center and the data centers themselves. The network must be able to:

- Deliver services anywhere, anytime, to any device
- Scale and grow efficiently
- Handle all types of information (including big data, data analytics, video, etc.), while delivering the highest quality of service
- Ensure data security from end to end

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Cisco is the only company that can deliver the required caliber of network performance, availability, and security – from the end user, across the network, to the data center. Following is a brief summary of just some of advantages of Cisco Borderless Networks that provide superior support for pervasive virtualization and private clouds:

- Cisco Borderless Networks, with leading solutions in every product category, help you build sufficient bandwidth to increase your virtualization density, promote rapid and reliable application mobility, deliver always-available services, and meet user expectations for the highest quality of service, even when using the largest data analytic applications or bandwidth-consuming video.
- Network intelligence that extends from the user, through the network, and to the data center supports service prioritization, to effectively deliver on service level agreements.
- Policy management capabilities travel with virtual machines across the network, within and between data centers, to minimize risk and promote end-to-end security, trust, privacy, control, and compliance.
- Cisco delivers a self-healing network that can automatically redirect workloads transparently in the event of failure.
- Cisco's high-performance and resilient network supports highest application mobility and availability to increase IT efficiency and integrate with service provider networks in hybrid cloud scenarios.

#### **Network Virtualization**

In a virtualized environment, the network no longer stops at the cable that plugs into the back of a server. With virtualization, it now extends into the server as a software version of a network switch, a firewall, a load-balancer or several other network functions. In order to continue to provide the expected levels of network services, such as high-availability, dynamic QoS, security, and application acceleration, the network services need to become virtualized and virtual-machine-aware. Cisco Unified Network Services allow network and security staff to maintain complete visibility, security, and control of the virtualized environment in the same way they did with the physical environment, but with all the benefits of virtualization.

#### **Virtual Machine Efficiency**

Increasing virtual machine efficiency becomes an essential ingredient of overall data center efficiency. For many applications, such as virtual desktop and other IT infrastructure applications, a high density of virtual machines per server will create a greater return on investment. Some physical servers are not designed to increase virtual machine density because the lack of memory creates a block to adding new applications. With Cisco UCS, however, innovative memory expansion technology allows organizations to host many more virtual machines than other server architectures, without sacrificing performance.

#### **Virtual Machine Performance**

To meet the expectations of applications managers, you will need an infrastructure designed to deliver outstanding performance for all types of applications – including mission-critical applications. Cisco data center solutions provide the right foundation for even the most demanding applications. For instance, many applications require access to high-performance I/O or need to be able to maintain very low latency. Cisco UCS overcomes these challenges with innovations like 10-gigabit access and hypervisor-bypass capabilities to increase throughput and performance for memory-intensive applications. In addition, the ability of the Cisco UCS to deliver dynamic QoS by taking advantage of capabilities like vMotion's dynamic resource scheduling allows you to prioritize applications in shared infrastructures to help ensure you meet specific application service-level agreements (SLAs).

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### **Virtual Machine Consistency**

By migrating applications to virtual machines instead of utilizing physical servers, IT organizations can simplify their overall operational model by creating operational process that can be consistent from development and testing production, to backup, and finally to disaster recovery. We offer Cisco UCS solutions for rack mount, blade server, and branch offices that allow IT organizations to build consistent virtual machine operations. Combined with Cisco UCS service profiles, these solutions can create extremely consistent and flexible virtual environments with the ability to improve many aspects of IT operations.

### **Virtual Machine Mobility**

Data centers need to be designed to support frequent change. Virtual machines can be migrated manually or dynamically from one server to another to improve load balancing or resource utilization, allow maintenance, or address specific geographic needs. Cisco Unified Fabric is designed with highly-scalable, high-performance Layer 2 networks that can span a single data center or multiple data centers, facilitating your evolution to cloud computing. For instance, by leveraging Cisco Nexus® 1000V Series Switches, Cisco Fabric Path, Overlay Transport Virtualization (OTV), and Cisco Locator/ID Separation Protocol (LISP), network administrators can build extreme flexibility into their designs to shift large workloads between servers and facilities, potentially opening new frontiers in disaster recovery, data center consolidation, and energy management. And, the Cisco Unified Fabric allows you to build this capability at the pace your business needs, extending investment protection for existing Layer 3 architectures or mixed environments.

### **Virtual Machine Security and Policy**

To maintain security and compliance as you virtualize your data centers and evolve to private cloud architecture, you will need to ensure that the right policies follow a virtual machine wherever it moves. Cisco Unified Network Services – which include Cisco Nexus 1000V Series Switches and Network Analysis Module Virtual Service Blades, Cisco Virtual Network Service Data Path (vPath) technology, and Cisco Virtual Security Gateway – provide dynamic security policy management and visibility while virtual machines move within and across the data center. This comprehensive view of virtual machine and security policies meets the requirements of both network and security administrators, and because the switching, security, intrusion-detection, and policy capabilities are all virtualized, they also lay the foundation for hybrid cloud architectures in the future. In addition, Cisco Nexus switching products can provide dynamic QoS policies that can be extended from server to access to core, enforcing policy for SLAs across tiers of applications.

### **Pre-Tested and Pre-Validated Solutions**

In addition to these virtualization-enabling features of the Cisco Unified Data Center platform, Cisco provides validated designs for a wide range of solutions with ecosystem partners like SAP, VMware, Citrix, Microsoft, and others, to take full advantage of the power of a Cisco data center infrastructure. These [Cisco Validated Designs](#) include step-by-step processes and specific resource requirements to remove the risk and speed time to market of your virtualized solutions.

## **Standardization**

### **Challenges and Requirements**

IT standardization is a strategy that requires establishing uniform specifications for IT infrastructure and processes and minimizing the number of similar technologies used to address the same basic need. Once in place, standardization can streamline procurement, simplify management, reduce maintenance effort, and speed deployments. The goal of standardization is to deliver consistently high-quality services at less cost.

Another aspect of standardization is the use of standards-based products with open APIs. Industry-standards-based solutions promote common architectures and make it easier to integrate new technologies and functionality into core business processes. It is rare to find an off-the-shelf product that precisely matches business needs, making it necessary to combine products from different vendors—a process made easier by standard interfaces and protocols.



## Objectives of Automation Phase

- Dramatically reduce provisioning time for new services
- Consistently implement best practices and enforce policies
- Maximize asset utilization
- Improve productivity
- Enable self-service IT

## Benefits of Automation: Winterflood Securities

- Winterflood Securities, an international capital markets firm based in London, needed a platform capable of processing up to 250 million data updates daily, with peaks of 30,000 updates per second.
- Chose Cisco Unified Data Center solutions to update its infrastructure and use automation to improve performance and business agility.
- Winterflood now has the ability to provision a new service overnight to quickly capture a new market opportunity and go live in time for the next day's trading.

Forrester Research estimates that the use of nonstandards-based products can increase development costs between 5-12% and lengthen the development schedule by 12-24% for a medium-sized application. A standards-based infrastructure also leads to a more stable environment because industry standards typically evolve slowly without rapid, disruptive changes.

Hardware and software aren't the only aspects of IT that benefit from standardization. Organizations seeking operational excellence are increasingly looking at their IT management processes to identify best practices, establish a common set of expectations, and drive consistency. As with infrastructure, standardization paves the way for automation, while also increasing business agility, improving infrastructure flexibility, and lowering support and maintenance costs.

## Automation

Once you have established a pervasive virtualization foundation for your data center and standardized your infrastructure and IT processes, introducing automation solutions can dramatically increase efficiencies, productivity, and agility, including the ability to deliver IT as a service.

### Challenges and Requirements

Business demands for IT services continue to grow, but, unfortunately so can your IT costs, if the systems are not managed with greater efficiency. In order to keep the value of IT services growing faster than IT costs, IT organizations need to expand automation across all processes by simplifying deployments, reducing operational costs, improving productivity, and increasing business time-to-market, while decreasing the opportunity for error.

To accomplish this, you need to ensure that your virtualized IT infrastructure is designed, from its foundation, for simplified management. To preserve existing investment in management platforms and the management systems that govern data center solutions, IT organizations must also seamlessly integrate existing investment in other management platforms within the existing data center ecosystem. In addition, as these organizations continue to evolve to the private cloud, the number of requests from internal constituents will continue to increase. You will need solutions that allow you to meet these requirements quickly and build solutions to leverage the power of your cloud-based infrastructure.

### Cisco Innovations in Automation

Cisco provides a wide range of automation capabilities through the Unified Data Center platform and through the open API architecture that enables integration with other management and automation solutions.

### Built-In Automation Capabilities

Cisco provides many levels of built-in automation to help you roll out new IT services faster and with more flexibility and efficiency. For instance, Cisco UCS service profiles facilitate stateless computing, which is the foundation of private cloud solutions. In addition, Cisco UCS can be automated through an open XML API, including servers, network and storage I/O, allowing system-level deployments.

Cisco Unified Network Services facilitate dynamic network capabilities such as firewall and switching and integrate with tools like VMware Site Recovery Manager (SRM) to deliver automated capabilities such as automated backup or disaster recovery. By utilizing Cisco Wide Area Application Services (WAAS) technology, IT organizations can run applications traffic and their backups more efficiently, regardless of where users or applications are located.



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### **Cisco Intelligent Automation for Cloud**

One way to address the increasing demand for IT services by internal constituents in a more efficient manner is to provide internal users with self-service access to IT offerings using fast, automated delivery. To accomplish this, IT must first create a catalog of standardized service offerings, implement policy-based controls, and set standards for management of the service lifecycle. This solution must allow IT to automate various aspects of their operations, including service and infrastructure provisioning, service change management, metering and billing/chargeback, and resource orchestration across various infrastructure resources, including compute, virtualization, networking, storage and applications. Finally, IT must present this catalog of IT services to users via a self-service portal.

Cisco Intelligent Automation for Cloud combines these capabilities and provides a single platform with which enterprises can build a self-service catalog to offer and deliver internal cloud services. This advanced automation and orchestration software provides automation across the various elements of Infrastructure as a Service (IaaS) and platform as a service (PaaS) clouds. The Cisco Intelligent Automation for Cloud solution provides a web-based, self-service interface that helps end-users to view service options based on their role, organization, and other access controls. They can order services, provide configuration information through dynamic forms, and track and manage their services and usage on an ongoing basis. The catalog also allows IT to associate costs with various services, which can be integrated with billing and financial services for chargeback if desired. The order process can also manage policies such as the lease period, so that services that are no longer needed can be expired and the associated resources pulled back into the pool.

### **Cisco Process Orchestrator**

Process orchestration uses pre-defined, best-practice process flows – specific to a particular platform – to facilitate automation that is consistent, repeatable, traceable, and centralized. Automation packs and platform adapters are available for a wide range of solution platforms such as Microsoft SQL Server, Oracle (9i, 10g, 11g), VMware, SAP, and BMC Remedy, among others. Cisco Process Orchestrator integrates event and alert management data into the operational support model, enables intelligent incident response. Successful orchestration helps IT organizations control costs, improve efficiency, ensure quality, and speed delivery of services to the business.

### **Ecosystem Partners**

The Cisco automation strategy for cloud computing also includes an open ecosystem of management partners. Cisco UCS Manager and Cisco Data Center Network Manager integrate to provide a simplified, unified, and open management solution, with programmable APIs to easily integrate with other management platforms. Cisco has certified our cloud solutions to work with leading automation and management vendors such as BMC, CA, IBM, HP, VMware, EMC, Ionix, and many others.

## **Choices for Implementing Private Cloud**

We have reviewed some of the challenges, opportunities, and technology decision points you will face as you prepare your infrastructure for delivery of ITaaS and cloud computing. No matter what stage of the journey you are in, you have numerous choices in how to acquire, build, and consume IT services. You can determine whether you want to build your own private cloud infrastructure, purchase pre-integrated components, or choose a cloud service package. Additionally, you can consider a hybrid cloud model, as a growing number of cloud service providers offer solutions that can be consumed as individual services.

The Cisco philosophy is to offer choices to our customers. In addition to providing you with the essential building blocks, architectures, and integrated systems for building private clouds, we also work with the best-in-class providers in each category, to deliver fully tested and pre-validated, solutions such as Vblock Infrastructure Platforms from VCE and FlexPod for VMware solutions with NetApp.

## Elastic Infrastructure: Cisco IT

- Cisco is deploying an internal private cloud to provide more elastic IT infrastructure to all of its worldwide business units.
- Based on Cisco UCS with VMware vSphere, Unified Fabric networking, and Cisco Intelligent Automation for Cloud.
- Eventually will virtualize 80% of data center resources and have reduced TCO by more than 32%.
- Reduced time-to-provision from weeks to just 15 minutes.
- Maintenance activity reduced from 70% of total IT resources to just 40%.

## Vblock Infrastructure Platforms

When VCE launched Vblock Infrastructure Platforms, they were the industry's first completely integrated IT offering combining best-in-class virtualization, networking, computing, storage, security, and management technologies with end-to-end vendor accountability. These integrated units of infrastructure help organizations rapidly deploy virtualization and cloud-based solutions so customers quickly see a return on their technology investments. Vblock solutions are also designed to help customers reduce the total cost of ownership with integrated, tested, and validated solutions built upon a standard infrastructure designed to reduce management and maintenance costs. Vblock Infrastructure Platforms offer flexible EMC-based storage capacities and leading processing and network performance, as well as support such incremental capabilities as enhanced security and business continuity, propelled by the integration of Cisco data center solutions with VMware vSphere. VCE Vblock Infrastructure Platforms are optimized for a wide range of virtualized solution deployments with ready-to-deploy Vblock-powered solutions for SAP, VMware View, and Microsoft Exchange, to name a few.

## FlexPod

FlexPod for VMware solutions are also founded on a data center infrastructure that is optimized for virtualized environments, including Cisco data center solutions, VMware vSphere, and NetApp FAS storage. The FlexPod for VMware configuration comes as a complete data center in a one-rack cabinet that you can deploy quickly and easily. As an example, the base FlexPod configuration can support 1500 users for these four popular workloads simultaneously: VDI, MS Exchange, MS SharePoint, and Microsoft Structured Query Language (SQL) Server. FlexPod for VMware is also designed to be easily flexed to meet configuration requirements in your specific environment. You will be able to rely on step-by-step design guides and sizing tools, so there is no guesswork involved.

## Changing the Data Center Paradigm: Becoming a Competitive Asset

As your data center transformation continues, your goals will change from saving money to enhancing organizational agility and delivering innovative solutions to drive business competitiveness. While the transformation may involve steep learning curves and organizational discord at times, the evidence of your progress will come through the added value you bring to your organization. It may start out simply, in the form of faster response time, more satisfied users, and fewer emergencies. Ultimately, the value will go deeper, to new types of services with greater reliability and performance, at lower costs than were possible in the old structure. Your IT organization may be perceived less as a support function, and be asked to participate earlier in business strategy and new product discussions.

Internal indications may be more subtle. Your IT staff may find that they are able to say yes more frequently and decline requests less often. There may be fewer overtime hours required to support off-hours system maintenance or emergency updates. You may see higher levels of cross-training in your employees and experience lower turnover.

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## Taking Your Next Step

As you progress through your data center transformation, here are some recommendations:

- Evaluate your current status in the consolidation and virtualization process. What are the greatest challenges that you are experiencing? Where are the greatest untapped opportunities? Are your IT departments ready to consider changes?
- Create an initial plan for your next step. Do you have a new set of applications that you are considering? Is there a project for which the budget is particularly constrained? Do you have organizational support to implement a private cloud? Create your initial goals for the project and then identify both technology and organizational changes that might be required. Analyze your strengths and weaknesses. Determine who can support you in those areas.

## Conclusion

If you new to cloud technology implementation, Cisco can provide the expertise you need. Cisco not only provides the technology infrastructure to help you successfully build and deploy a high-performance, cost-efficient private cloud, but we also have the experience to guide you. Cisco Cloud Enablement Services and our partners' offerings can help you tackle specific obstacles and realize the full business value of your IT investments faster. Backed by our networking and security expertise, an innovative unified architecture, and a broad ecosystem of partners, Cisco can help you to build a highly secure, agile, and automated cloud infrastructure.

## For More Information

For more information about Cisco Unified Data Center, visit <http://www.cisco.com/go/datacenter>



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