

Manage FlexPod with Cisco UCS Director and Cisco Intelligent Automation for Cloud

Challenge

The strategic discussion today among chief information officers (CIOs) and IT managers is about business agility and operation efficiency. The need to simplify and more easily manage the data center is apparent when you recognize that more than 70 percent of the IT budget pays for operating costs, maintaining existing services instead of deploying new ones. Every IT administrator, operations manager, and CIO is challenged by this reality, supported by traditional infrastructure that is hard wired and difficult to manage.

As a result, the IT environment continues to become increasingly complex, placing a greater burden on IT staff at a time when budgets are flat or decreasing. One major burden is the management of the IT environment, with considerable staff time needed to configure, deploy, and manage applications and infrastructure.

A recent IDC survey¹ shows just how heavy this burden has become. IT decision makers report that approximately 75 percent of IT staff time is spent maintaining the existing environment, with less than 25 percent of staff time being spent on value-added activities. A deeper look into the maintenance activities reveals:

- 24 percent of staff time is consumed by presystem deployment
- 23 percent of staff time is consumed by turning on and preparing systems for applications
- 29 percent of staff time is consumed by monitoring, performing updates and patch management, performing health monitoring and analysis, and troubleshooting

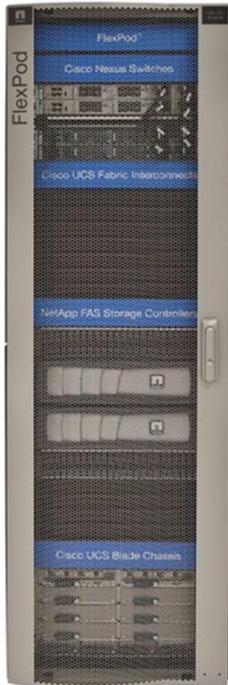
In an effort to shift this 75:25 ratio more toward innovation and cost reduction, organizations are deploying converged infrastructure, such as FlexPod, which provides pretested, integrated solutions across virtualization, computing, network, and storage layers, improving time efficiency and reducing costs.

FlexPod: A Different Data Center Platform

Cisco and NetApp designed FlexPod by combining the innovations delivered through the Cisco Unified Computing System™ (Cisco UCS®), Cisco Nexus® fabric, and the NetApp Data ONTAP operating system (Figure 1). The FlexPod goal of dramatically increased efficiency is achieved by unifying disparate network interfaces and cabling into a uniform 10-Gbps fabric. Coupled to this fabric are Cisco UCS servers, delivering industry-leading performance through CPU-memory interface design. FlexPod also incorporates NetApp Data ONTAP capabilities to reduce storage costs and provide zero-downtime storage maintenance.

¹ IDC, 2011

Figure 1. FlexPod Solution



In a [recent economic impact study by Forrester](#), high-level business objectives for investing in FlexPod included:

- Cost reduction: To reduce the time and money spent on managing servers and storage
- Support for business needs: To create a more flexible and agile server and storage infrastructure to respond to business needs more quickly
- Reduced risk with prevalidated design and vendor support: To reduce risk with a prevalidated FlexPod virtual desktop infrastructure (VDI) workload configuration, cooperative vendor support, and a broad ecosystem of delivery partners
- Reduced energy consumption: To consolidate data center servers and storage, saving power and cooling costs; FlexPod provides consistency with known capacity, floor space, and power requirements
- Reduced time-to-market: To deploy new applications and workloads in minutes instead of the weeks required by traditional systems

Benefits of FlexPod Innovations

The computing and storage layers can be managed with element managers that allow IT operations to manage each layer individually. Cisco UCS Manager and NetApp OnCommand deliver system console capabilities for managing Cisco UCS and NetApp FAS storage. Each of these element managers also provides APIs for integration into higher-level management solutions such as Cisco UCS Director and Cisco® Intelligent Automation for Cloud (IAC).

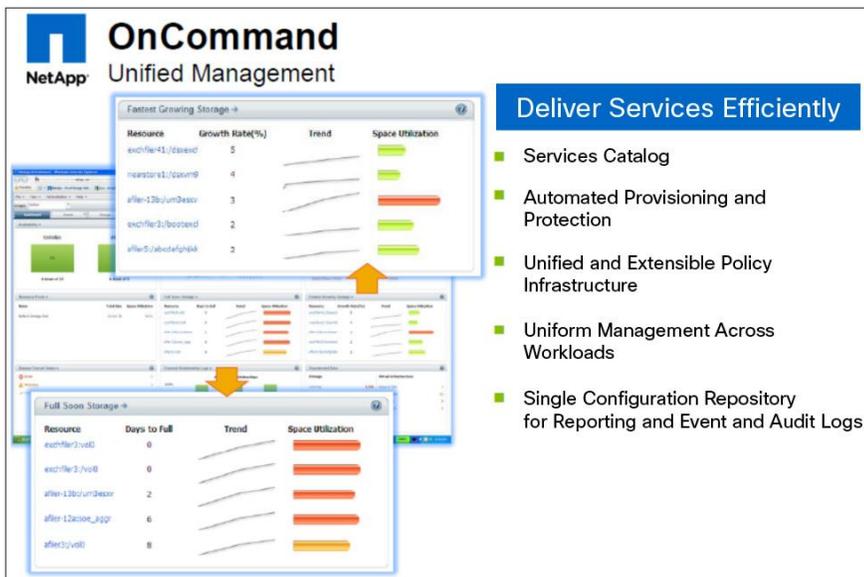
[Cisco UCS Manager](#)

Cisco UCS Manager orchestrates the individual components of Cisco UCS into servers that are networked together and connected to upstream aggregation-layer LAN and SAN switches. Every component of Cisco UCS is designed to be flexible and malleable, with configuration, identity, and connectivity defined on demand to meet a specific business purpose. Cisco UCS Manager enhances efficiency through the concept of service profiles. A service profile is a software definition of a server and its LAN and SAN network connectivity. Service profiles allow server resources to be treated as raw computing capacity that can be allocated and reallocated among application workloads, allowing IT operations to experience greater efficiency from Cisco UCS in both virtualized and nonvirtualized environments.

[NetApp OnCommand Management](#)

NetApp OnCommand data management software (Figure 2) delivers effective, cost-efficient management of NetApp and multivendor environments, helping organizations optimize utilization and performance, reduce risks and downtime, and meet service-level agreements (SLAs).

Figure 2. NetApp OnCommand Data Management Software

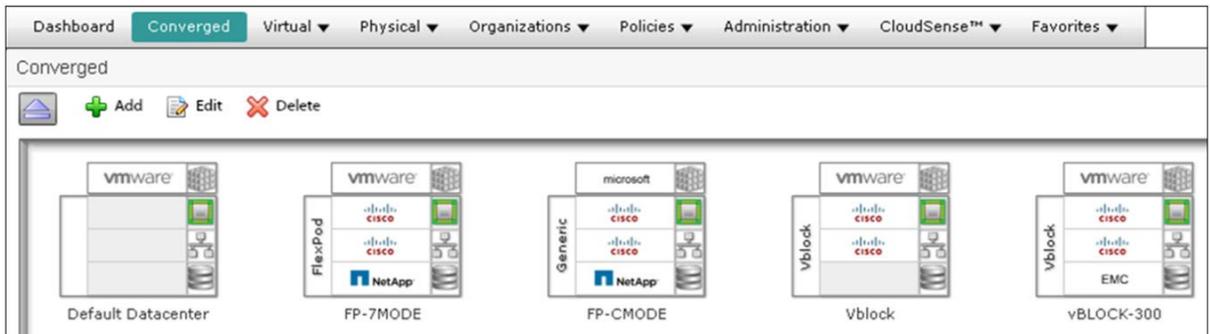


Both Cisco UCS Manager and NetApp OnCommand provide IT with operating efficiencies at each layer. However, neither FlexPod nor its individual element managers can deliver the operating efficiencies and cost advantages that can be obtained from managing FlexPod as a single solution with centralized automation and management.

Cisco UCS Director

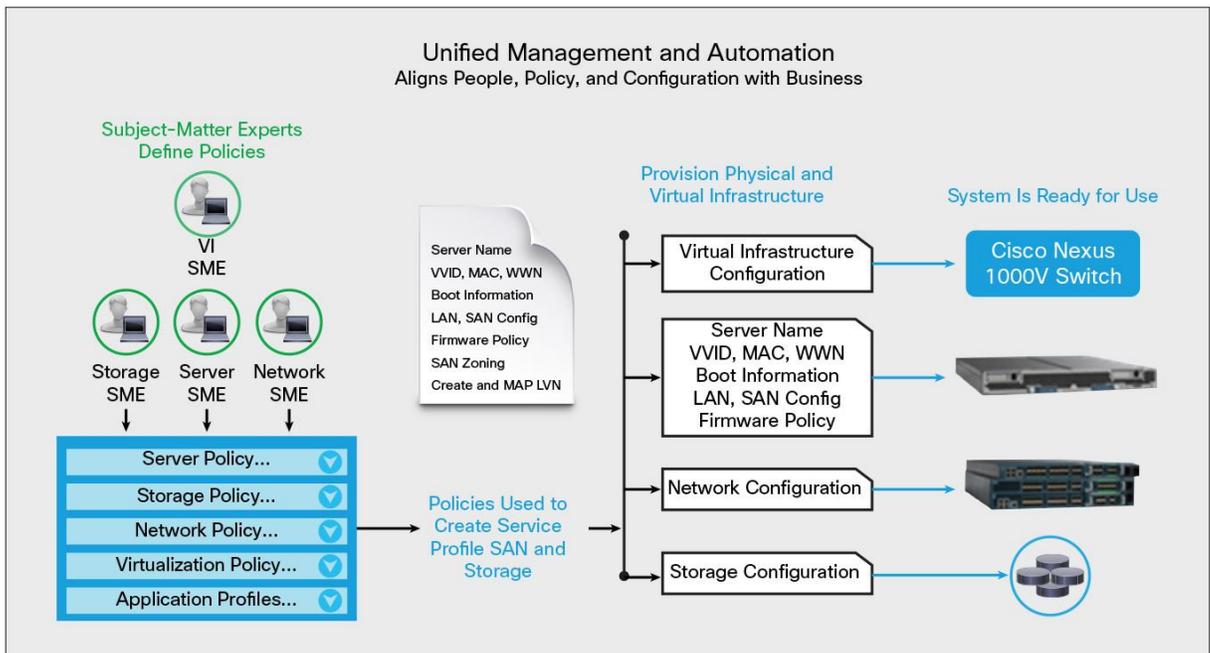
Cisco UCS Director automates end-to-end IT processes, abstracting the complexity of individual devices, hypervisors, and virtual machines. It uses the same concept as Cisco UCS, extended to application resources across computing, network, storage, and hypervisor resources. Cisco UCS Director enables resource delivery across the virtualization, computing, network, and storage layers from a single pane (Figure 3). The self-service portal enables IT administrators and IT consumers to quickly request and receive infrastructure resources. Cisco's unified management approach reduces deployment time from weeks to minutes in both virtual and bare-metal environments, a unique capability in the industry.

Figure 3. Cisco UCS Director Single-Pane Management for Multivendor Infrastructure Solutions



Like Cisco UCS Manager, Cisco UCS Director brings together subject-matter experts (SMEs), who define the policies and best practices for their IT departments. The network engineer defines the VLANs and network configuration for specific groups and applications. The storage engineer defines data protection and SAN configurations. Server and virtualization administrators define allowable resource configurations and pools. Cisco UCS Director enforces these policies and automates resource delivery upon request by authorized users (Figure 4).

Figure 4. Domain Experts Define Policies to Provision FlexPod Instances in Minutes



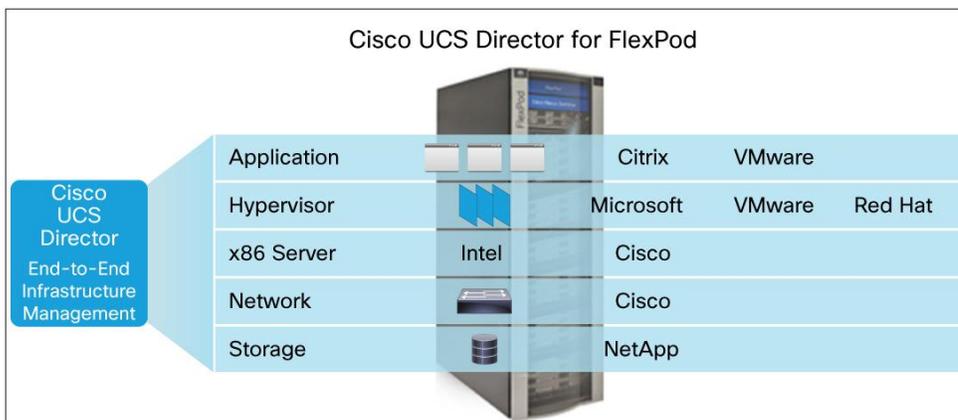
Cisco UCS Director offers superior management of FlexPod. Differentiators include:

- **Single-purpose solution:** Unlike other solutions that require a combination of six to eight different modules or components, Cisco UCS Director was designed from the start with a single purpose: to manage converged infrastructure as a single entity. Cisco UCS Director delivers a single API and architecture that allows easy integration into higher-level solutions such as cloud management platforms and third-party solutions delivering financial management and chargeback functions.

- Ease of installation and use: Cisco UCS Director can be installed and ready to use in less than one hour. However, it is highly recommended that customers take advantage of the two-day deployment class available to facilitate the movement of IT operations from a manual to an automated workflow design.
- Multivendor support: Cisco UCS Director manages all three versions of FlexPod using NetApp Data ONTAP 7 and cluster mode. It also manages industry-leading converged infrastructure as well as standalone computing, network, and storage solutions from other industry leaders.
- Task library: Cisco UCS Director talks natively to NetApp Data ONTAP and OnCommand through an extensive task library. This capability provides customers with a unique advantage over solutions that use plug-ins or adapters, which offer only 25 percent of NetApp functions to customers. Furthermore, each task has its own API attached, allowing workflows to be run immediately or published for execution at a later time.
- Model-based orchestration: Cisco UCS Director uniquely offers infrastructure discovery that is completed immediately upon installation. This infrastructure discovery mechanism understands the physical and logical context of every infrastructure component and interconnects with the other components in the FlexPod system. As a result, as elements move or change, such as storage logical unit numbers (LUNs), Cisco UCS Director infrastructure discovery detects these changes, updates the database, and helps ensure that workflows run smoothly without interrupting business processes. In contrast, in traditional solutions, static blueprints need to be rewritten when simple changes occur in the infrastructure.

Cisco UCS Director delivers single-click, end-to-end management of FlexPod from a single pane, reducing complexity in today's data center and allowing organizations to begin to shift the 75:25 ratio more toward innovation and away from infrastructure management (Figure 5). In fact, Forrester has noted that an automated solution such as Cisco UCS Director can save organizations up to US\$265,000 per year.²

Figure 5. Cisco UCS Director Offers End-to-End Management for NetApp Data ONTAP 7 and Cluster Mode FlexPod Solutions



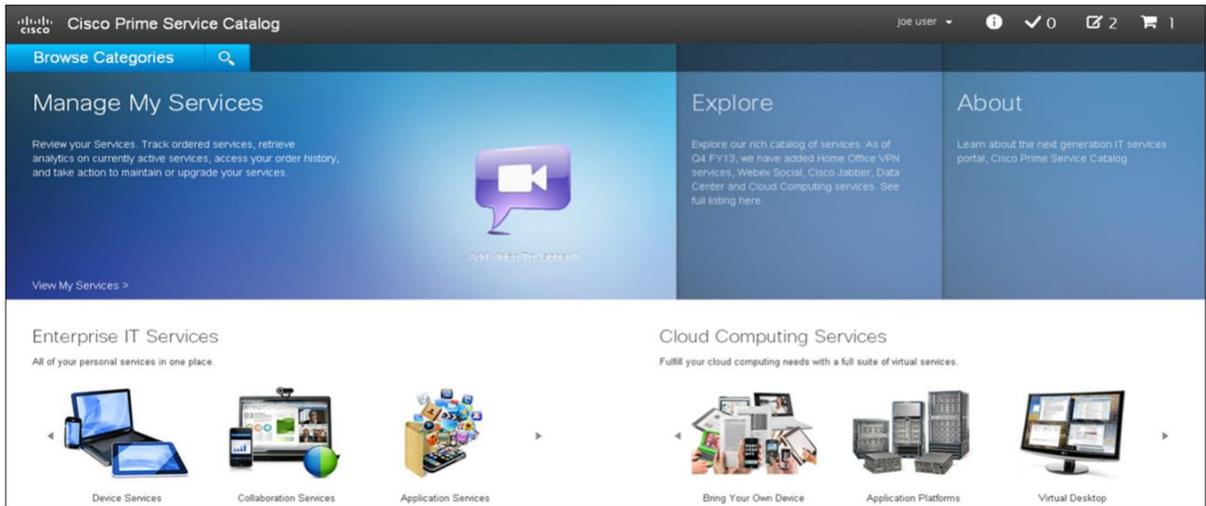
Cisco Intelligent Automation for Cloud

Data centers today are being transformed from infrastructure providers into partners that deliver business services. The cloud is the technology leading this transformation, and FlexPod and Cisco UCS Director provide an optimal foundation for organizations seeking to move to private or hybrid cloud service-based delivery.

² Forrester: "Total Economic Impact of NetApp and Cisco's FlexPod Data Center Platform," January 2013

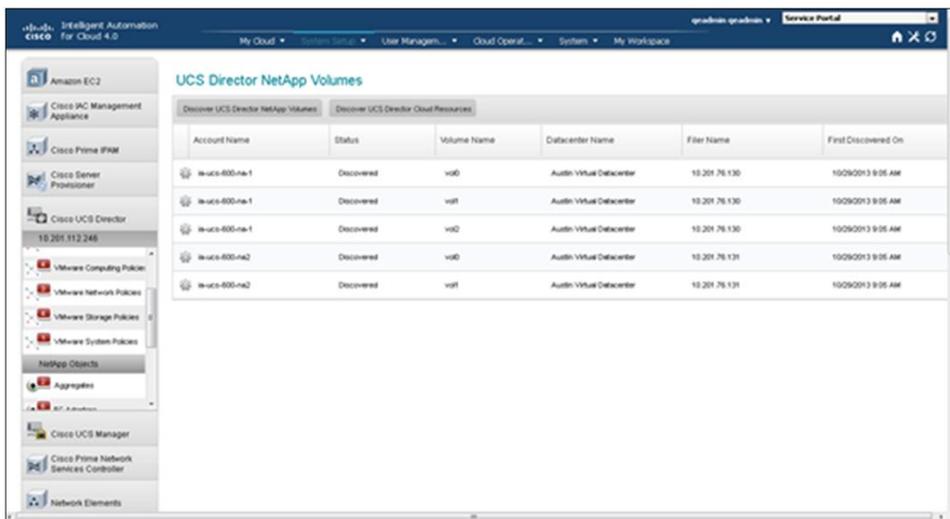
Cisco IAC delivers a comprehensive cloud management platform for capabilities ranging from converged infrastructure management to anything-as-a-service (XaaS) deployment through a robust self-service portal. Unlike solutions that have their genesis in infrastructure-as-a-service (IaaS) models, Cisco IAC provides a flexible configuration solution for both private and hybrid cloud service delivery (Figure 6).

Figure 6. Cisco IAC Self-Service Portal Expands the Cloud Taxonomy Beyond the Data Center



The line between data center services and traditional office services is starting to blur as customers seek ways to include collaboration, bring-your-own-device (BYOD) initiatives, and even common office services into the cloud taxonomy built on FlexPod. The Cisco IAC self-service portal delivers a shopping-cart experience with anchor solutions, such as enterprise IT service, network services, and cloud computing, to deliver the single ordering experience required in today's organizations (Figure 7).

Figure 7. User Interface Integration of Cisco IAC and Cisco UCS Director Delivers End-to-End Service on FlexPod



With Cisco IAC Release 4.0, Cisco IAC and Cisco UCS Director have an integrated user interface, delivering an end-to-end service delivery experience for the FlexPod infrastructure instance, supporting the application from a single order. This integration eliminates the need for trouble tickets and reduces delays through the automated deployment of physical or virtual data stores directly through Cisco UCS Director.

Cloud Accelerators

The number of cloud-based use cases going beyond IaaS is increasing at a rapid pace. But with annual product releases, many cloud-management solutions are lagging in their delivery of these advanced use cases. Cisco solves this problem by delivering cloud-based mini-solutions, or cloud content cartridges that snap directly into the Cisco IAC framework and self-service portal, allowing customers to reduce the amount of time needed for evaluation and deployment to production of these advanced cloud use cases. Two of the most popular cloud accelerators today are:

- **Cisco Application Stack Accelerator Pack:** This accelerator pack allows customers to take advantage of the growing interest in development and operations (DevOps) and platform-as-a-service (PaaS) models to deliver multitier application stacks using Puppet Labs, Opscode Chef, or internally developed scripts. This accelerator pack enables the automation of the design and deployment of multitier application stacks in single or multiple instances for specifically defined roles with the greater discipline and structure desired by today's data centers.
- **Cisco UCS Director Accelerator Pack:** This accelerator pack is for customers who do not need full integration between Cisco IAC 4.0 and Cisco UCS Director, but who still need to deploy physical data stores to their existing virtual data centers. This accelerator pack allows Cisco UCS Director to be discovered as a hybrid cloud node, allowing IT to make available provisioning of FlexPod or NetApp FAS storage in their virtual data centers.

Conclusion

Since its introduction in 2010, FlexPod has emerged as the leading converged infrastructure platform because of its flexible architecture, validated designs, and global partner program to serve customers.

FlexPod significantly reduces costs and increases operation efficiency at the infrastructure level, but FlexPod alone cannot move IT toward innovation. That move requires the automated provisioning and management delivered by Cisco UCS Director. FlexPod and Cisco UCS are excellent companions for organizations seeking to increase IT staff efficiency and innovation.

For organizations seeking to move beyond IaaS, Cisco IAC uses the combination of FlexPod and Cisco UCS Director to deliver private and hybrid cloud service deployment across multiple solutions and suppliers from a single self-service portal.

For More Information

- [Forrester Total Economic Impact study](#)
- [Cisco UCS Director](#) and FlexPod solution brief on Cisco.com
- [Cisco UCS Director video](#) on Cisco YouTube channel
- [Managing FlexPod with Cisco UCS Director](#) on Cisco YouTube channel
- Cisco Intelligent Automation for Cloud website: <http://www.cisco.com/go/iacloud>
- Cisco IAC cloud accelerators page: <http://www.cisco.com/en/US/prod/netmgtsw/accelerators.html>



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