FlexPod

FlexPod Datacenter with Microsoft Private Cloud

A Microsoft Validated Private Cloud Fast Track Reference Implementation

What Is FlexPod Datacenter with Microsoft Private Cloud?

FlexPod® Datacenter with Microsoft® Private Cloud is a reference implementation validated by the Microsoft Private Cloud Fast Track program that combines Cisco® and NetApp® technology, including compute, network, storage, and value-added software components, with Microsoft software and consolidated guidance. Says Brian Hillger, director of Server and Tools Marketing at Microsoft, "The Microsoft Private Cloud Fast Track architecture is a proven approach for deploying the Microsoft Cloud Platform on premises, and the award-winning FlexPod Datacenter platform is validated for both SAN and NAS storage approaches. Built on Windows Server 2012 R2 with Hyper-V and System Center 2012 R2, the Cisco and NetApp FlexPod Datacenter solution simplifies private cloud deployment for customers, with the goal of dramatic reduction of infrastructure and application deployment time from days to hours."

The latest reference architecture is built on Windows Server® 2012 R2 Hyper-V® and Microsoft System Center 2012 R2. Microsoft private cloud offerings can help customers and service providers build dedicated infrastructure-as-a-service (IaaS) environments that transform the way they deliver IT services. Specifically, Microsoft Private Cloud Fast Track solutions provide a streamlined approach to delivering scalable, preconfigured, and validated infrastructure platforms for on-premises private cloud implementations. With local control over data and operations, IT can dynamically pool, allocate, secure, and manage resources for agile IaaS. Likewise, business units can deploy line-of-business applications with speed and consistency using self-provisioning (and decommissioning) and automated data center services in a virtualized environment.

Fast Track's validation guidance also includes the usage of Windows® Azure Pack for Windows Server 2012 R2. This enables a single pane of glass for enterprises to deliver Microsoft Azure technologies into the private cloud, facilitating a rich, self-service, multi-tenant cloud with Microsoft Azure-consistent experiences and services.

Key Features

Increase Agility
Respond more quickly at reduced cost to changing business needs with nondisruptive operations.

Improve Efficiency
Automate management tasks using Microsoft System Center 2012 R2 integrated with NetApp data management software, Cisco UCS® Manager, and Cisco UCS PowerTool, a comprehensive infrastructure management offering.

Reduce Total Cost of Ownership
Increase utilization, decrease administrative burden on IT staff, and leverage existing investments.

Improve Performance, Security, and Control
Deliver greater bandwidth, lower latency, and a more consistent experience worldwide.

Utilize a Proven Platform
The proven combination of NetApp and Cisco technology solutions and expertise helps you jump-start your Microsoft private cloud deployment.

Best of
TechEd 2013

Best Hardware
Appliance 2013

A Private Cloud on Your Terms: Simplify Your Data Center Transformation

FlexPod Datacenter with Microsoft Private Cloud is built on leading computing, networking, storage, and infrastructure software components. It provides an excellent private cloud solution through:

- Award-winning systems management and operations: FlexPod Datacenter with Microsoft Private Cloud was named the 2013 Best of TechEd North America award winner for Systems Management and Operations
- Jointly validated technologies from industry leaders in computing, storage, networking, and server virtualization
- One platform built from unified computing, fabric, and storage technologies, with popular and trusted software virtualization
- Integrated components that help enable you to centrally manage and automate all of your infrastructure pools, including unified SAN and NAS storage with support for SMB 3.0
- An open management framework that integrates with your existing third-party infrastructure management solutions

Accelerate Deployment

With FlexPod Datacenter with Microsoft Private Cloud, the comprehensive feature set and detailed guidance make Microsoft private clouds easy to deploy:

- End-to-end architectural and deployment guidance

- Streamlined infrastructure planning with the use of predefined capacity
- Enhanced capabilities and automation tailored to your needs to support Microsoft applications in the private cloud
- Ease of repeatability, enabling your organization to simply deploy another FlexPod solution as your needs grow and change, without needing to start from the beginning

Move to the Cloud with Confidence

Validated configurations mean that you can implement your move to the cloud with confidence. To help reduce the risk in your move to the cloud, FlexPod Datacenter offers:

- Integrated management for physical and virtual machines
- A self-service portal for rapid and simplified provisioning of resources
- Validated, end-to-end interoperability of computing, storage, and networking resources
- Predefined, out-of-the-box solutions based on a common cloud architecture
- High-availability design with no single point of failure

Gain Greater Scalability

FlexPod Datacenter can scale up for greater performance and capacity or scale out for environments that need numerous consistent deployments. You can size and optimize FlexPod to accommodate different use cases, such as application workloads that include but are not limited to:

- Microsoft SQL Server®
- Microsoft Exchange
- Microsoft SharePoint® Server
- Desktop virtualization
- Secure multi-tenant environments

FlexPod Datacenter: The Foundation for a Microsoft Cloud Infrastructure

Together, NetApp and Cisco deliver a strong foundation for Microsoft cloud: NetApp provides sophisticated storage capabilities and tight integration of data management software with Microsoft products, and Cisco supplies a leading-edge data center platform that consolidates core server and networking functionalities. When your organization builds a private cloud with FlexPod, Windows Server 2012 R2, and System Center 2012 R2, it can deliver IT services and applications more efficiently and cost effectively.

Compute

Cisco delivers state-of-the-art enterprise computing resources. The Cisco Unified Computing System™ (Cisco UCS) is a server platform specifically designed for virtualized environments.

- Unite compute, network, storage connectivity, and virtualization into a single cohesive system.
- Automate large-scale server and application deployments by using policy-based service profile templates in Cisco UCS Manager.

Network

Cisco UCS integrates computing resources with Cisco Nexus® switches and a unified I/O fabric.

- Greatly simplify network management and reduce costs by consolidating traffic onto a single high-performance, highly available 10 Gigabit Ethernet network.

What Is Prevalidated?

FlexPod Datacenter combines networking, computing, and storage with management software for a best-in-class converged infrastructure that supports numerous applications and workloads. This prevalidated architecture has been rigorously tested by Cisco and NetApp and delivers a proven configuration that enables fast, consistent deployments and reduced risk as organizations move to private-cloud computing.

- Take advantage of the integration of computing resources by using Cisco Nexus switches to provide an intelligent method for identifying and handling different types of network traffic.

Storage

The unified storage architecture from NetApp can help to reduce cost and complexity for virtualized storage in your private cloud environment with a single, highly scalable solution. Storage options supported with Windows Server 2012 R2 include iSCSI, Fibre Channel, and FCoE SAN infrastructure as well as SMB 3.0 for deployment simplicity and scale in a NAS environment.

- Deliver unified storage with clustering capabilities to keep your business running nonstop.
- Enhance efficiency and save disk space with built-in deduplication and thin provisioning.
- Deploy thousands of virtual machines in minutes with NetApp FlexClone® technology.
- Boost availability with integrated Snapshot™ technology for space-efficient backups.
- Accelerate VM deployment with ultrafast cross-protocol file transfers.

Management

The FlexPod Datacenter solution takes advantage of System Center 2012 R2 capabilities with Cisco UCS management packs, Cisco UCS PowerTool for PowerShell, OnCommand® Plug-In for Microsoft, and the Data ONTAP® PowerShell Toolkit. All of these enable the comprehensive management and automation of compute and storage workflows across cloud infrastructures.

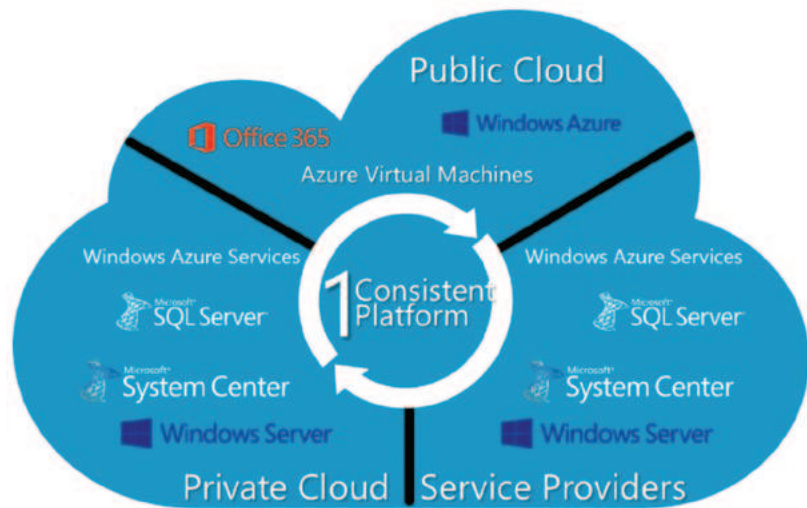- The NetApp OnCommand Plug-In for Microsoft extends monitoring

Figure 1) Private Cloud Fast Track reference architecture.
The FlexPod Datacenter with Microsoft Private Cloud architecture is preengineered, tested, and optimized for virtualization. It supports the operating system, virtualization, and management capabilities offered by Windows Server 2012 R2, Hyper-V, and System Center 2012 R2.

and managing storage systems directly from Microsoft System Center 2012 R2.
- NetApp provides the Data ONTAP PowerShell Toolkit, a collection of more than 1,400 cmdlets that make NetApp APIs available within Windows PowerShell® scripts to automate a wide variety of NetApp specific management and operational tasks.
- Cisco offers comprehensive infrastructure management controlled by Windows PowerShell with Cisco UCS PowerTool, a user-friendly Cisco UCS management tool based on a command-line interface.
- Operations teams can use Cisco UCS PowerTool to easily tie together the management of storage components, compute components, and software applications into a custom, end-to-end management solution that is easy to use and easy to script.
- Microsoft Windows Azure Pack provides service provider-ready tenant service portals.

Private Cloud Technologies

Microsoft System Center 2012 R2

A cloud and data center management solution, Microsoft System Center 2012 R2 builds on the core capability provided by Windows Server 2012 R2. It delivers a flexible, cost-effective private cloud infrastructure in a self-service model, while using existing data center hardware and software investments. This solution delivers:

- **Infrastructure provisioning.** Enables enterprises and service providers to provision an infrastructure that meets their key requirements.
- **Automation and self-service.** Facilitates the agility enterprise owners need while providing data center administrators the tools they need to drive cost-effectiveness and IT control.
- **Infrastructure monitoring.** Provides a single toolset to monitor infrastructure resources across on-premises, service provider, and Microsoft Azure environments.

- **Application performance monitoring.** Provides the deep insight necessary to deliver predictable application SLAs to application owners.
- **IT service management.** Provides the necessary service management processes to help enterprise IT deliver services in a flexible manner.

Windows Server 2012 R2 Hyper-V

With Windows Server 2012 R2, it is now easier than ever for organizations to take advantage of the cost savings of virtualization and make the optimum use of server hardware investments by consolidating multiple server roles as separate virtual machines. This technology:

- Offers customers significant cost savings through virtualization.
- Improves virtualization density and makes optimal use of server hardware investments

Microsoft Windows Server 2012 R2
Microsoft System Center 2012 R2

Cisco Unified Computing System

Cisco UCS Manager
Cisco UCS PowerTool

Cisco Nexus Switches and Unified Fabric

NetApp FAS Storage

NetApp OnCommand Plug-in for Microsoft
Data ONTAP PowerShell Toolkit
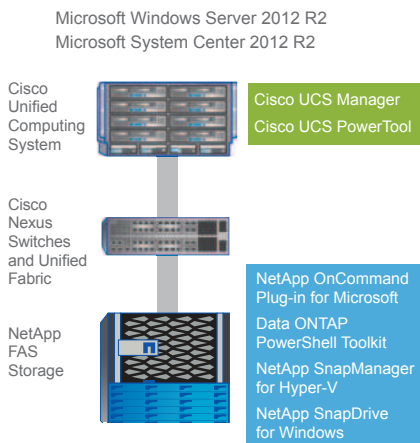NetApp SnapManager for Hyper-V
NetApp SnapDrive for Windows

Figure 2) FlexPod Datacenter with Microsoft Private Cloud components.

by consolidating multiple server roles as separate virtual machines; these virtual machines can use Hyper-V to efficiently run multiple operating systems—Microsoft Windows, Linux®, and others—in parallel on a single server.

- Extends virtualization capabilities with more features, greater scalability, and built-in reliability mechanisms.

FlexPod Datacenter

FlexPod Datacenter combines NetApp and Cisco components to deliver a prevalidated, best-in-class data center or infrastructure solution with deep integration with the Microsoft private cloud infrastructure.

Leading Components
- Cisco Unified Computing System
- Cisco Nexus family switches
- Cisco UCS PowerTool
- Microsoft System Center management packs
- NetApp fabric-attached storage hardware
- NetApp clustered Data ONTAP
- NetApp OnCommand Plug-In for Microsoft
- Data ONTAP PowerShell Toolkit
- NetApp SnapManager® for Hyper-V
- NetApp SnapDrive® for Windows

FlexPod Datacenter Features
- Flexible and performance-matched stack that scales to fit Windows application workloads
- Step-by-step validated design, deployment, and application sizing guides

- Enhanced efficiency and disk savings through built-in deduplication and thin provisioning
- Consolidated, multiprotocol, high-performance, highly available 10 Gigabit Ethernet network with support for iSCSI and FCoE (Fibre Channel is available separately, if desired)
- Support for several classes of computing and unified storage architecture in a single deployment
- High availability configuration with no single point of failure

FlexPod Cooperative Support Model
- FlexPod Cooperative Support leverages the combined experience, resources, and technical expertise of NetApp, Cisco, Microsoft, and our industry-leading partners.
- Microsoft's participation in the Cooperative Support Lab is available for FlexPod customers running Windows Server 2012 R2 with Hyper-V and System Center 2012 R2.
- The Cooperative Support Lab provides a streamlined response to customer issues with technologies and expertise available from the FlexPod Cooperative Support Model partners. This environment enables the partners to more easily replicate and resolve multivendor issues.

For More Information
- *www.cisco.com/go/microsoft*
- *www.netapp.com/microsoftcloud*
- *www.microsoft.com/privatecloud*