

FlexPod®

FlexPod Datacenter with Citrix XenDesktop

Desktop virtualization from NetApp, Cisco, and Citrix for on-demand growth

The Challenge

The trend toward virtualization and cloud computing continues to gain momentum among IT organizations. As part of this transition, desktop virtualization is playing a more prominent role in the IT strategy for meeting critical business goals.

Many organizations are virtualizing their traditional desktop environments — either as an enterprise solution or as an incremental step toward a private cloud—based on a number of business drivers, including:

- Improved security and compliance
- Increased workforce flexibility
- Simplified desktop and application management
- Lower total cost of ownership (TCO)
- Streamlined upgrades such as migration to Microsoft® Windows® 7.1 or 8

To fully embrace desktop virtualization, businesses need an end-to-end solution that can flexibly accommodate future growth and provide continuous access to thousands of desktops, at a price tag that won't break the bank. Unless that desktop virtualization solution delivers a user experience that matches or beats the traditional PC experience, it risks being rejected by desktop users. The fact that today's workers are more mobile and require access to their desktops anywhere in the world, anytime, and on the latest devices only adds to the challenge.

To support such a dynamic business environment where needs and requirements change frequently and often on short notice, IT needs the agility to expand, contract, and reallocate infrastructure quickly.

Key Benefits

FlexPod® is a leading solution for Citrix desktop virtualization because it:

- Reduces risk and TCO with a preconfigured, validated design
- Offers balanced CPU, memory, I/O, and storage capacity for optimized performance
- Lets you clone and provision desktops in minutes
- Offers an easily expandable modular design for on-demand growth
- Lets you scale your desktop infrastructure up or out

CITRIX®



The Solution

Unified, pretested, and validated infrastructure

To meet the challenges of today's IT organizations, NetApp and Cisco collaborated to create the FlexPod solution. FlexPod is a proven, long-term data center solution built on a flexible, shared infrastructure that can scale easily and be optimized for a variety of mixed application workloads. It can also be configured for virtual desktop or server infrastructure, secure multi-tenancy, and cloud environments. FlexPod is a validated configuration that delivers a virtualized data center in a rack. It comprises leading computing, networking, storage, and infrastructure software components and differs from other virtualization offerings by providing:

- Validated technologies from industry leaders in computing, storage, networking, and desktop and server virtualization
- A single data center platform that lets you scale to meet the largest data center requirements without disruption or architectural changes in the future
- Integrated components that enable you to centrally manage all your infrastructure pools
- An open-design management framework that integrates with your existing third-party infrastructure management solutions

FlexPod Datacenter with Citrix XenDesktop

The FlexPod Datacenter solution brings the power of the FlexPod concept to Citrix customers by providing an easy-to-deploy, self-contained virtual desktop solution in a rack. FlexPod Datacenter with Citrix XenDesktop is a preconfigured and

"Our executives loved the simplicity and power of the integrated stack in FlexPod. And for IT, the prevalidated architecture with prescriptive sizing and design guides reduced our risk."

Wojciech Biernacki
IT Systems Administrator
University of Tennessee, Knoxville

validated desktop architecture. It is built on a flexible and secure shared IT infrastructure using leading technology from NetApp, Cisco, and Citrix.

The solution is optimized for XenDesktop deployments and combines NetApp® unified architecture, advanced data protection, and provisioning technologies with the Cisco Unified Computing System™ and Cisco Nexus® switches to provide a secure and robust platform for virtual desktop environments.

The architecture is configured for virtual desktop deployments but also offers optional secure multi-tenancy capabilities that deliver the security and efficiency of a shared IT infrastructure, enabling the virtualized desktop environment to be isolated from other mission-critical application workloads.

The solution is built on virtualization that encompasses desktop operating systems; applications; and compute, network, and storage components that have been both validated to reduce risk and optimized to lower TCO. Data protection and disaster recovery are integrated across the entire stack to increase the availability of virtual desktops, applications, and data. The solution design is completely modular, providing XenDesktop customers with the flexibility to transform their infrastructures at their own pace and based on their specific needs.

FlexPod Datacenter with Citrix XenDesktop provides:

- An easy-to-deploy, self-contained virtual desktop solution in a rack, with integrated backup, data protection, and disaster recovery for continuous access to desktops, applications, and data
- Near-instantaneous cloning and provisioning of desktops and the flexibility required for dynamic, on-demand expansion

Investment Protection with Standardized, Flexible IT

Together, NetApp, Cisco, and Citrix provide a unified and flexible architecture that is ready for virtualized environments today, yet is agile enough to let you expand your infrastructure at your own pace to a fully private cloud. The Ethernet-based FlexPod framework fits right into your current infrastructure, eliminating the cost of replacing your existing technology. FlexPod components are integrated and standardized to help you achieve timely, repeatable, consistent deployments and eliminate guesswork from the sizing process.

FlexPod can support up to hundreds or thousands of virtual desktops, depending on the workload profile, and can also be configured to support a number of additional workload environments, such as Microsoft Exchange, Microsoft

SharePoint®, and Microsoft SQL Server®, with built-in headroom for expansion. FlexPod comes with a sizing guide that shows you how to flex the solution to meet your specific requirements for desktop virtualization, either as a standalone workload or with other workloads if performance and operational requirements permit.

Best-in-class Components and Features

Core components from Citrix, Cisco, and NetApp include:

- Citrix XenDesktop, with support for multiple hypervisors and management consoles
 - Citrix XenServer and XenCenter
 - VMware vSphere® and VMware vCenter™
 - Microsoft Hyper-V® and System Center Virtual Machine Manager
- Cisco Unified Computing System and Cisco Nexus family switches
- NetApp FAS system, NetApp clustered Data ONTAP®, and complete storage and data management software suite



Figure 1. FlexPod DataCenter with Citrix XenDesktop, a prevalidated reference architecture combining NetApp storage, Cisco Unified Computing System (UCS) servers, and Cisco Nexus switches.

Benefits of the Integrated Solution

- Performance-matched stack optimizes infrastructure resources
- Step-by-step deployment guide enables fast implementation
- Detailed application profiling and sizing guide protects against oversizing or undersizing the infrastructure
- Support for multiple classes of computing and storage in a single FlexPod system provides deployment flexibility
- Centralized infrastructure management reduces operational complexity and cost

NetApp Unified Storage Amplifies the Benefits of XenDesktop

Traditional storage solutions force you to buy separate systems for different storage needs in a typical virtual desktop environment. NetApp addresses these varying needs by accommodating desktop, application, and user data on the same unified storage architecture that is based on the Data ONTAP operating system.

In addition, NetApp reduces storage costs and increases performance for XenDesktop—without adding disks—through deduplication of redundant desktop, application, and user data. The use of NetApp flash technologies and the built-in efficiencies in Data ONTAP provide read and write IOPS optimization for desktop environments. NetApp's near-instantaneous cloning and provisioning of desktops provide the flexibility required for dynamic, on-demand expansion.

The centralized, automated, and space-efficient backup of desktop, application, and user data, along with cost-effective disaster recovery,

provides the high availability, data protection, and security that customers demand. Clustered Data ONTAP also offers data mobility to enable nondisruptive operations during maintenance, upgrades, and technology refreshes.

Cisco Unified Computing System

Cisco Unified Computing System (Cisco UCS®) is a data center platform specifically designed for virtualized environments. Cisco UCS unites computing, networking, and storage connectivity and virtualization into a single cohesive system that is best suited to meet the unique demands of desktop virtualization. Cisco UCS is designed to eliminate time-consuming manual integration, reduce TCO, and greatly increase business agility.

Cisco UCS integrates computing resources with Cisco Nexus switches and a unified I/O fabric, which provides an intelligent method for identifying and handling different types of network traffic, including storage I/O, streamed desktop traffic, management, and access to enterprise applications. You can consolidate all traffic onto one high-performance, highly available 10-Gigabit Ethernet network to greatly simplify network management and reduce costs.

Cisco UCS addresses the unique requirements of Citrix XenDesktop by providing a scalable, flexible, and simplified infrastructure that reduces the cost and complexity of virtual desktop deployments. The FlexPod validated design uses the flexibility of Cisco UCS to host the XenDesktop hosted virtual desktop infrastructure and hosted-shared desktop delivery models in the most flexible and scalable manner. The Cisco UCS

extended memory architecture enables higher densities of virtual desktops, resulting in lower compute, network, space, and power costs.

The Cisco UCS Manager interface also provides service profile templates that let you automate large-scale desktop, server, and application deployments based on predefined policies to deliver a stateless computing environment.

Citrix Sets the Standard for Desktop Virtualization

Citrix XenDesktop with FlexCast technology enables IT to deliver Windows as a service that is always on, highly secure, and seamlessly mobile. XenDesktop quickly and securely delivers any type of virtual desktop or Windows, web, or software as a service (SaaS) application to all the latest PCs, Mac® computers, tablets, smartphones, laptops, and thin clients—all with a high-definition user experience, bringing unprecedented flexibility and mobility to your workforce. XenDesktop unleashes the full productivity and creativity of every worker while helping the entire organization adapt rapidly to new challenges and opportunities.

To make the best use of your organization's talents, you must give users access to their desktops, applications, and data wherever they are in the world—and wherever they go—any time they need them. With XenDesktop, your users can take advantage of virtual work styles such as teleworking and home sourcing to integrate computing more seamlessly into their lives, and continue to be productive even when

they're away from the office. Today's workers are more savvy than ever when it comes to the latest mobile devices. XenDesktop empowers them to use smartphones, tablets, personal laptops—any device they choose—as a seamless part of their corporate desktop experience.

By transforming complex, distributed desktops into a simple, on-demand service, XenDesktop frees you from the costs and constraints of traditional computing architectures. Centralized delivery, management, and control of virtual desktops bring new levels of efficiency to your IT organization while streamlining security and compliance. Self-service application provisioning, simplified help desk support, and support for mobile and virtual work styles give you a foundation to leverage a new generation of IT models and strategies.

Accelerated Time to Value in XenDesktop Environments

The FlexPod solution fits right into your current infrastructure. This eliminates the cost of replacing your existing technology and protects your investments. The modular solution design allows flexible starting points. You can start small and add desktops or workloads later. The solution can scale securely to any size, and it paves the way for future growth.

Cooperative Support for Rapid Resolution

The cooperative support model between Cisco, NetApp, and Citrix provides a streamlined process with cross-trained staff and a unified

support lab to rapidly resolve issues for FlexPod. In addition, relationships between company executives, business units, and engineering teams help make sure that customers get what they need to keep their mission-critical desktop virtualization infrastructure up and running smoothly.

Proven Partnership

As industry leaders in storage, networking, and desktop virtualization, respectively, NetApp, Cisco, and Citrix have a global presence and have been working together on solutions for virtualized data centers. Our collaboration has resulted in more efficient virtualization and cloud computing solutions and numerous jointly validated reference architectures. Together we have helped thousands of mutual customers improve agility and lower costs.

Open Delivery Ecosystem

You can choose from a broad network of world-class solution delivery partners to implement FlexPod. These partners understand your business requirements and are all certified and trained on NetApp, Cisco, and Citrix, as well as complementary technologies, to deliver a complete enterprise or cloud solution that fits your business needs.

Getting Started

To learn how FlexPod enables you to build a flexible and efficient shared infrastructure today as your foundation for future-ready IT, contact your local data center partner.

