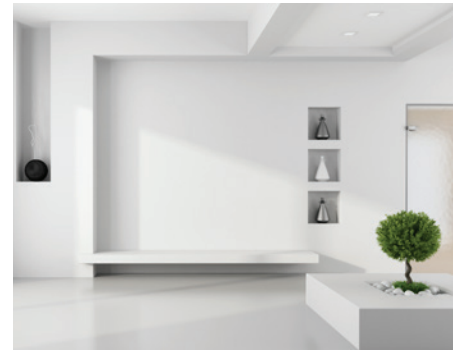


Accelerate Your Large Citrix Virtual Desktop Deployments

With SmartStack Integrated Infrastructure from Cisco and Nimble Storage



HIGHLIGHTS

Accelerate Your Business

- Accelerate application deployment and time-to-value and support line-of-business IT requirements.
- Reduce risk to your application environment with validated solutions.

Deliver Optimal Performance and Availability

- Increase desktop performance and precisely allocate resources to thousands of virtual desktops.
- Reduce complexity with unified, integrated infrastructure.
- With no single point of failure and with Nimble Storage® arrays, deliver 99.9997 percent uptime.

Reduce Costs

- Scale computing, networking, and storage performance independently as you need it to adapt to changing business requirements.
- Deploy scale-out applications and desktops supporting hundreds of users in a 2-rack-unit (2RU) footprint.

What if you could quickly and easily deploy, scale, and manage your large Citrix virtual desktop and application environments? With this SmartStack™ solution based on Cisco UCS® Integrated Infrastructure and Nimble Storage® arrays you can.

With this SmartStack enterprise-class solution from Cisco and Nimble Storage you can easily deploy, scale, manage, and protect your large Citrix XenDesktop environments. You can reduce risk and increase the efficiency of your employees and IT staff at an affordable price without compromising performance, while also proactively improving reliability.

This validated solution integrates with Cisco UCS B-Series Blade Servers, Cisco Nexus® switches, Nimble Storage CS700 arrays, VMware vSphere 6.0, and Citrix XenDesktop 7.7 (Figure 1). This solution is well suited for businesses that want a single, scalable, enterprise-class platform on which to deploy their virtualized desktop environments with support for more than 2500 virtual desktops.

Accelerate Your Business

This solution has been tested through the Cisco® Validated Design process, which gives your staff the instructions and confidence to quickly deploy and scale a large virtual desktop environment. This pretesting greatly reduces the risk



SmartStack™



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of configuration errors that can cause long deployment times. The solution enables you to start small and use modular building blocks to incrementally scale either capacity or performance, or both, as your needs dictate. And it enables you to simplify by standardizing on a consistent platform—Cisco Unified Computing System™ (Cisco UCS)—which helps you reduce management costs and the risks associated with impromptu deployments.

This Cisco Validated Design, with the infrastructure summarized in Table 1, provides an easy-to-follow blueprint to help ensure successful deployment of a virtual desktop solution to meet all your employees' needs in a fraction of the time required for traditional, siloed architectures. Cisco, Citrix, and Nimble Storage have combined industry-leading infrastructure and software to create a comprehensive virtual desktop solution. Citrix XenDesktop is installed in a virtual server environment on Cisco UCS B200 M4 Blade Servers for flexible and easy scalability and deployment of virtual desktops. All Cisco UCS platforms are managed through a single-pane interface with Cisco UCS Manager.

Unified Management

Cisco is dedicated to simplifying computing and connectivity management with the Cisco UCS platform. Cisco UCS Manager was designed into the system from the beginning. It is embedded in the system and provides a simple interface for configuring and managing the system's servers, networking, and storage resources. Cisco UCS Director uses Cisco UCS Manager to provide automation and orchestration for the entire infrastructure, Cisco Nexus and Cisco MDS switches, Nimble Storage arrays, and VMware vSphere.

Cisco UCS Manager

The Cisco UCS platform offers a flexible pool of resources that can be configured on demand to support the intended

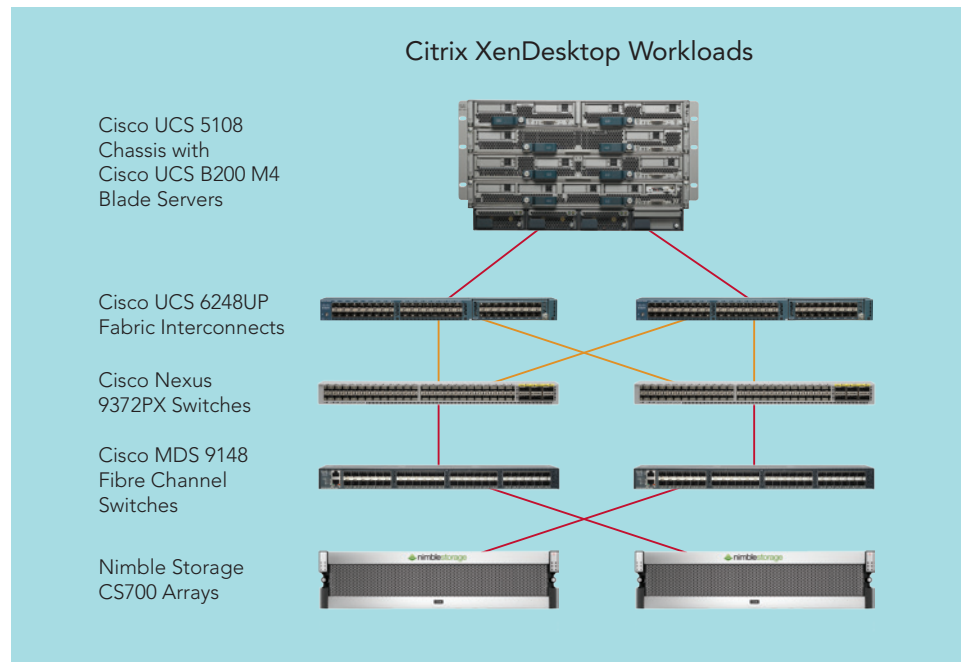


Figure 1 This scalable Cisco Validated Design for SmartStack Integrated Infrastructure accelerates deployments so that you can respond quickly to your employee's needs

workload. This flexibility is achieved by extracting server identity, configuration, and connectivity characteristics so that Cisco UCS servers become stateless. With the server state extracted into a software model, you create policies to configure your servers automatically through Cisco UCS Manager, which is embedded in a pair of Cisco UCS 6200 Series Fabric Interconnects. The manager participates in server, fabric, and storage provisioning and device discovery, inventory, configuration, diagnostics, monitoring, fault detection, auditing, and statistics collection. Cisco UCS Manager helps significantly reduce management and administration expenses by automating routine tasks to increase operational agility.

Cisco UCS Director

SmartStack solutions managed by Cisco UCS Director dramatically increase your staff efficiency and significantly reduce the number of errors that can result from repetitive, manual configuration tasks. The policy- and workflow-based automation performed by Cisco UCS Director increases

efficiency, frees staff time, and helps ensure compliance. Cisco UCS Director provides comprehensive infrastructure automation and orchestration for the entire solution summarized in Table 1. The unified infrastructure provisioning and management delivers superior infrastructure-as-a-service (IaaS) management capabilities with the following benefits:

- Preconfigured task library that spans Cisco and third-party hardware solutions to help you build your infrastructure in minutes
- Plug-in for Nimble Storage arrays for integrated deployment and management
- Reduced data center complexity by replacing manual provisioning and deprovisioning tasks with workflows that span computing, network, storage, and virtualization functions
- Lower capital expenses with real-time monitoring, dynamic load balancing, and optimum resource use

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Deliver Optimal Performance and Availability

SmartStack is an integrated infrastructure solution developed by Cisco and Nimble Storage that combines Cisco UCS Integrated Infrastructure with Nimble Predictive Flash storage arrays to deliver speed, scale, and simplicity to your data center. To solve customer problems quickly, SmartStack also provides pretested Cisco Validated Designs for a diverse and growing set of workloads, including Citrix XenDesktop.

Cisco UCS B200 M4 Blade Server

Designed from the beginning to support server virtualization, the Cisco UCS B200 M4 Blade Server delivers performance, flexibility, and optimization for your Citrix XenDesktop environment. The Cisco UCS B200 M4 can be quickly deployed with the programmable ease-of-use of the Cisco UCS Manager software. Based on the Intel® Xeon® processor E5-2600 v3 or v4 product families, it offers up to 1.5 terabytes (TB) of total memory with 64-GB DIMMs, up to two drives, and up to 80 Gbps of I/O throughput. The Cisco UCS B200 M4 offers exceptional levels of performance, flexibility, and I/O throughput to run your most demanding virtual desktop applications. Cisco UCS has the architectural advantage of not having to power and cool excess switches, network interface cards (NICs), and host bus adapters (HBAs) in each blade server chassis. Having a larger power budget per blade server provides uncompromised expandability and capabilities.

Nimble Storage CS700 Adaptive Flash Array

Nimble Storage delivers the industry's only hybrid predictive flash arrays. The enterprise-class Nimble Storage CS700 Adaptive Flash array combines a flash-optimized architecture with Nimble

Table 1. Enterprise SmartStack Integrated Infrastructure for Citrix XenDesktop

SERVERS	Cisco UCS 5108 Blade Server Chassis with: <ul style="list-style-type: none">• 4 Cisco UCS B200 M4 Blade Servers with• 1 Cisco UCS Virtual Interface Card (VIC) 1340
NETWORK	2 Cisco UCS 6248UP 48-Port Fabric Interconnects 1 Cisco Nexus 1000V Switch 2 Cisco Nexus 9372PX Switches (10 Gigabit Ethernet) 2 Cisco MDS 9148S 16G Multilayer Fabric Switches
STORAGE	Nimble Storage CS700 array with Predictive Flash technology Nimble Connection Manager for VMware ESXi
MANAGEMENT	Embedded Cisco UCS Manager Cisco UCS Director <ul style="list-style-type: none">• Nimble Storage plug-In for Cisco UCS Director Nimble Storage InfoSight
SOFTWARE	VMware vCenter plug-in for Nimble Storage

Storage InfoSight Predictive Analytics to deliver data quickly and efficiently to your virtual desktops, at one-third the total cost of ownership (TCO) of other hybrid flash arrays. The Nimble Storage CS700 is specifically designed for consolidating multiple large-scale critical applications with aggressive performance demands. It gives your users excellent data response, especially for deployments with more than 2500 virtual desktops.

If problems arise, Cisco and Nimble will work together with your IT organization to get your system up and running quickly. You get a rapid, coordinated resolution to your technical problem. SmartStack support keeps your critical infrastructure running when you need it most.

Drive Down Costs

Cisco and Nimble have performed extensive testing across a broad range of user applications and workloads to create a reference architecture that uses industry best practices. After Citrix XenDesktop is deployed on this infrastructure, you will have a configuration fully optimized for your virtual desktops and applications. This unique combination of SmartStack

integrated infrastructure all automated and managed from a single pane with Cisco UCS Director makes managing your complete Citrix environment easy and efficient, reducing TCO.

SmartStack can be deployed quickly and easily, on day zero, using SmartStack SmartSetup™, an intuitive, wizard-based setup utility that configures both the Cisco UCS and Nimble Storage environments in minutes. After the infrastructure is deployed, you can use Cisco UCS Director to deploy and manage additional infrastructure stacks. After Cisco UCS service profiles are set up, you can use them for even faster and simpler deployment of new infrastructure to independently scale your Citrix environment for capacity or performance. This unified management helps lower operating expenses by automating routine tasks, effectively freeing administrators from the constraints of labor-intensive manual configuration and management.

Nimble Storage InfoSight, an integral part of Nimble's Predictive Flash platform, uses predictive analytics to prevent problems across the entire application-to-storage stack—all in real time from the cloud.

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Simplify Your Virtual Desktop Environment

Cisco and Nimble have combined forces to bring you a pretested solution that allows you to quickly and easily deploy, precisely scale, and manage your large Citrix XenDesktop virtual desktop and applications environment. It allows you to reduce risk and increase the efficiency of your employees by giving them access to their desktop and applications where and when they need them. And it makes your IT staff more effective, helping IT deliver nonstop access at an affordable price without compromising performance and while proactively improving reliability.

For More Information

To learn more about SmartStack, visit:

- <http://www.cisco.com/go/smartstack>
- <http://www.nimblestorage.com/smartstack>

To read the Cisco Validated Design, visit:

- http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/smartstack_vdi_citrix_cs700.html



SmartStack™



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