Cisco Solutions for EMC VSPEX

CISCO

Cisco Solutions for EMC VSPEX

Cisco and EMC accelerate deployments of private cloud, end-user computing, and virtualized applications through a program called *EMC VSPEX Proven Infrastructure.*

Cisco understands that businesses deploy applications, not hardware, and they see delivering solutions as the most important factor in their decision-making processes. Businesses need high-performance solutions with end-to-end support for their applications. These solutions must incorporate servers, networks, and storage, to help applications perform and scale, and they must do so with lower total cost of ownership (TCO). When customers choose Cisco, they are choosing to work with a company that fully understands what is needed to deliver real solutions to meet real application needs.

Cisco and EMC have partnered to test and deliver simple, fully integrated and validated reference architectures to companies and partners that reduce risk and accelerate deployments. Cisco® Solutions for EMC VSPEX are simple, efficient, and flexible. They are built on industry-leading Cisco Unified Computing System™ (Cisco UCS®) servers powered by intelligent Intel® Xeon® processors with Cisco Nexus® Family switches and next-generation EMC® storage systems (Figure 1). They give IT departments:

· Choice of operating systems and hypervisors

· Predictable performance

· Reduced risk

· Shorter and more efficient planning, sizing, and configuration processes when deploying new or upgraded applications and services

· Greatly reduced deployment times

· Simplified infrastructure and management

· Flexible, scalable, and comprehensive solutions

These integrated solutions improve agility and ease scalability to quickly respond to business demands.

Not all companies are the same. Size, type, and current IT staff knowledge play important roles in determining the solutions needed. Cisco Solutions for EMC VSPEX are optimized to meet various size requirements and deliver choice by providing support for all major operating systems and hypervisors.

> "Because of the tight integration between EMC, Cisco and VSPEX, we have decided to leverage the VSPEX platform as the primary core of our network and infrastructure for all current and future applications."

Rajinder Gill
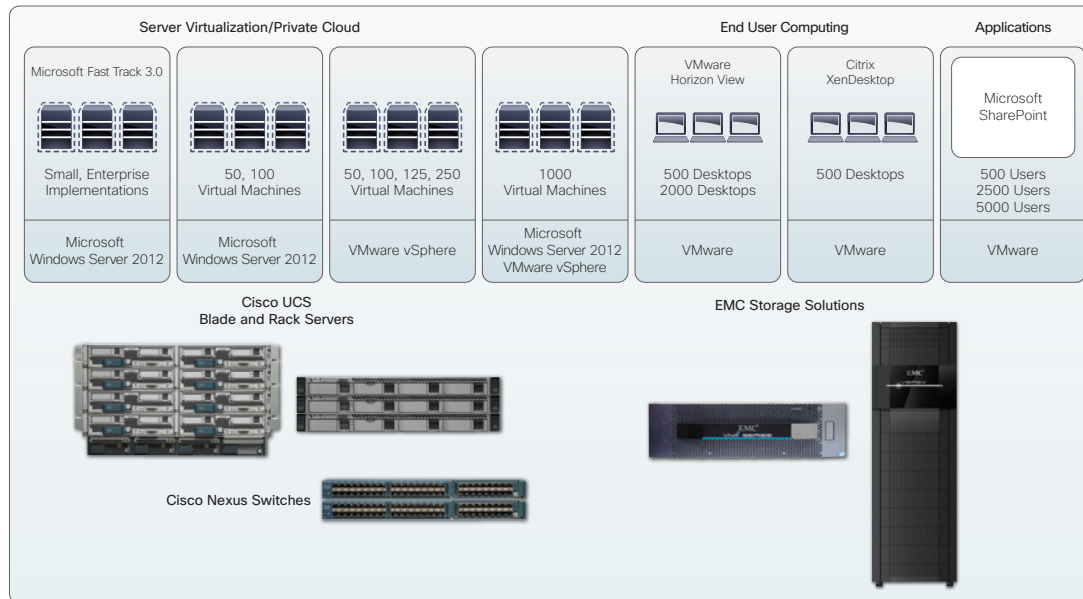Group Finance Director, Minor Weir & Willis, Ltd.

> "VSPEX was infinitely simpler compared to the competing solutions. I have one guy doing the entire job that normally I might have to have four involved with in the chain."

Sean Larsen
Infrastructure Manager, Bowker

Cisco Unified Computing System

Cisco Unified Computing System is intelligent infrastructure with unified management and connected by a single unified fabric

Server Virtualization/Private Cloud				End User Computing		Applications
Microsoft Fast Track 3.0				VMware Horizon View	Citrix XenDesktop	Microsoft SharePoint
Small, Enterprise Implementations	50, 100 Virtual Machines	50, 100, 125, 250 Virtual Machines	1000 Virtual Machines	500 Desktops 2000 Desktops	500 Desktops	500 Users 2500 Users 5000 Users
Microsoft Windows Server 2012	Microsoft Windows Server 2012	VMware vSphere	Microsoft Windows Server 2012 VMware vSphere	VMware	VMware	VMware

Cisco UCS Blade and Rack Servers

EMC Storage Solutions

Cisco Nexus Switches

Figure 1. Cisco Solutions for EMC VSPEX Delivers Prevalidated Best-in-Class Infrastructure for a Variety of Data Center Environments

Cisco UCS

Cisco UCS is the first truly unified data center platform that combines industry-standard, x86-architecture servers, powered exclusively by Intel Xeon processors, with networking and storage access in a single system. The system provides intelligent infrastructure that is automatically configured through integrated, model-based management to simplify and accelerate deployment of enterprise-class applications and services.

Cisco UCS servers, combined with a simplified, unified architecture, help increase IT productivity and provide a superior price-to-performance ratio, reducing TCO.

Unified Fabric: Combining Three Networks into One
Building on Cisco's strength in enterprise networking, Cisco UCS is integrated with a standards-based, high-bandwidth, low-latency, virtualization-aware 10-Gbps unified fabric to meet the bandwidth demands of today's applications. Whether Cisco fabric interconnects or Cisco Nexus Family switches are used, the unified fabric eliminates the cost of separate networks for each type of traffic while increasing workload agility, reliability, and performance.

Cisco Unified Computing System

Cisco UCS Wins Best of TechEd 2012 Breakthrough Technology Award

Cisco UCS servers and Cisco UCS Manager completely automate configuration of low-level hardware and BIOS and other settings, enabling solutions to be quickly deployed, cloned, and managed—even remotely. Cisco UCS servers also can be fully managed using Microsoft PowerShell or Microsoft System Center Orchestrator.

Directly Connecting Servers and Virtual Machines to the Network

The unified fabric reduces the number of networks in a system, whereas Cisco Fabric Extender Technology reduces the number of network layers by directly connecting physical and virtual servers to the system's fabric interconnects. This technology eliminates both blade server and hypervisor-based switches by connecting fabric interconnect ports directly to individual blade servers and virtual machines. Virtual networks now can be managed exactly like physical networks, but with massive scalability. This approach represents a radical simplification compared to traditional systems, reducing capital expenditures (CapEx) and operating expenses (OpEx) while increasing business agility, simplifying and accelerating deployment, and improving performance.

Bringing Automation to Information Technology

Cisco UCS provides intelligent infrastructure that is self-aware and self-integrating. The system is built from the foundation so that every aspect of server identity, personality, and connectivity is abstracted and can be applied through software. With Cisco UCS, servers are configured automatically, eliminating the manual, time-consuming, error-prone assembly of components into systems. With Cisco virtual interface cards (VICs), even the number and type of I/O interfaces is programmed dynamically, making every server ready to power any workload at any time.

Aligning Configurations with Workloads Through Policies

With integrated, model-based management, administrators manipulate a model of a desired system configuration and associate a model's service profile with hardware resources, and the system configures itself to match the model. This automation accelerates provisioning and workload migration with accurate and rapid scalability. For the first time, IT departments have an automated, policy-based mechanism for aligning the server configuration with the workload. The result is increased IT staff productivity, improved compliance, and reduced risk of failures due to inconsistent configurations.

Beyond Efficiency: Making IT More Productive

Cisco UCS helps organizations go beyond efficiency: it helps them become more effective through technologies that generate simplicity rather than complexity. The result is flexible, agile, high-performance, self-integrating information technology; reduced staff costs, with increased uptime through automation; and more rapid return on investment (ROI).

Next-generation EMC VNX storage systems deliver up to four times better application and file performance

EMC VNXe and Next-Generation EMC VNX Storage Systems

EMC VNX storage systems are optimized for virtual applications, delivering industry-leading innovation and enterprise capabilities in a scalable, easy-to-use solution. They are designed to meet the high-performance, high-scalability requirements of midsize and large enterprises. EMC VNX storage arrays are multiprotocol platforms that can support the Small Computer System Interface over IP (iSCSI), Network File System (NFS), Fibre Channel, and Microsoft Common Internet File System (CIFS) and Server Message Block (SMB) protocols, depending on the customer's specific needs.

EMC VNXe storage systems for small and medium-sized enterprises deliver:

· Unified storage that provides true storage consolidation with a unique application-based approach

· IP storage for network-attached storage (NAS) and iSCSI solutions

· Storage scalability–from 6 drives to 150 drives–to grow with business needs

· Multilevel storage, providing the right performance for applications

· Capacity management with thin provisioning, compression, and deduplication

EMC Avamar

EMC Avamar® data deduplication technology integrates into virtual environments to provide rapid and efficient backup and restoration capabilities. EMC Avamar deduplication results in much less data traversing the network and greatly reduces the amount of data being backed up and stored. This technology results in storage, bandwidth, and OpEx savings, with up to 90 percent less backup time and 81 percent less effort.

Cisco Virtualization and Cloud Solutions

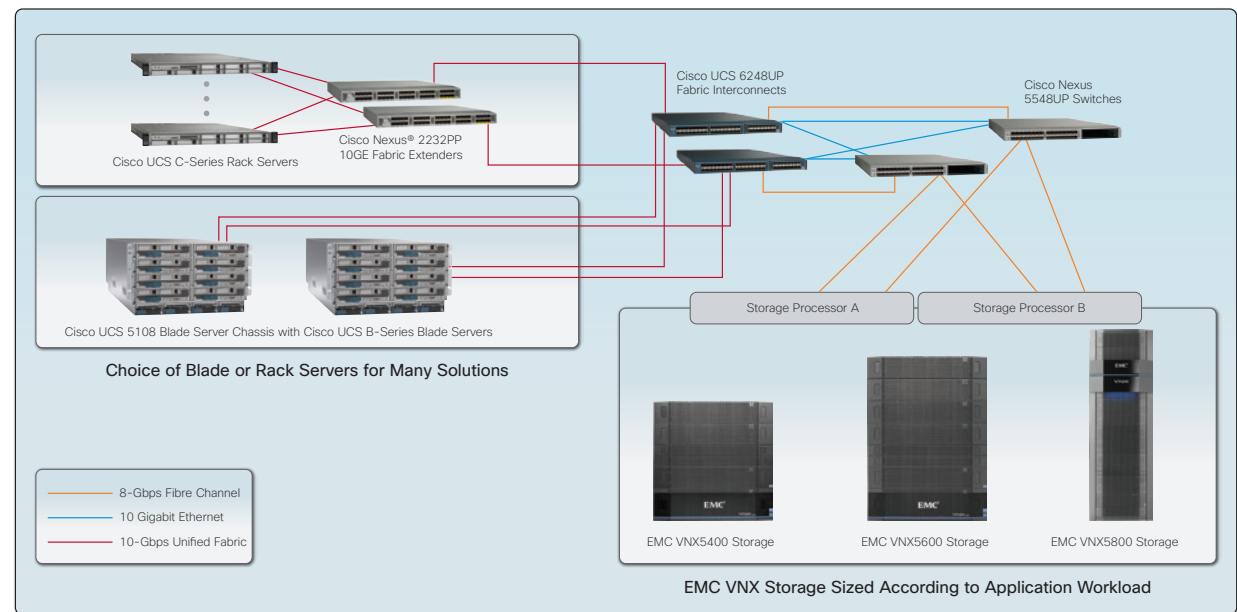## Cisco Virtualization and Cloud Solutions

Companies of all sizes are on the journey to cloud computing. This process often starts with implementation of server virtualization to gain more efficiency from the current data center. Then the IT department transitions to a service-based private-cloud environment. With Cisco Solutions for EMC VSPEX, Cisco and EMC provide a plan, with trusted, scalable, and predictable reference architectures, together with trusted server virtualization from both Microsoft and VMware, that greatly accelerates this transition process and delivers results quickly, efficiently, and with reduced risk (Figure 2).

One of the primary reasons that Cisco UCS has moved to number 2 in the market in less than three years is that Cisco designed Cisco UCS as a purpose-built system for the post-virtualization environment without the burden of having to support a traditional server product line and its associated components and management hierarchies. At every level of the system's architecture Cisco employed innovations in silicon to achieve the utmost performance, combining industry-standard, high-performance intelligent Intel Xeon processors with large memory capacities to handle the virtualized workload. Cisco went beyond manual integration of components and chose a model in which policies guide configuration—a model that scales and allows routine tasks to be completely automated. This approach allows Cisco UCS to deliver rapid scalability and deployment that increases IT productivity and provides the business agility needed for virtual and cloud solutions.

Microsoft Windows Server Hyper-V Solutions
Cisco Solution for EMC VSPEX with Microsoft Windows Server 2012 Hyper-V for 50 Virtual Machines
The Cisco Solution for EMC VSPEX with Microsoft Windows Server 2012 Hyper-V for 50 Virtual Machines delivers an end-to-end virtualization solution to

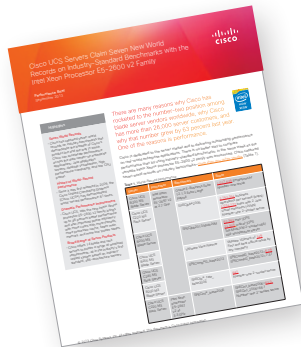Cisco UCS is your first step on the journey to cloud computing

Figure 2. Cisco Solutions for EMC VSPEX Give Customers a Choice of Blade or Rack Servers and the Capability to Size Storage According to Workload Requirements

Cisco Virtualization and Cloud Solutions

When you need cloud computing performance you can count on Cisco.

Cisco UCS claimed seven new world-record performance results on industry-standard benchmarks with the Intel Xeon processor E5-2600 v2 family.

efficiently virtualize up to 50 virtual machines for varied customer workloads. This solution uses Microsoft Windows Server 2012 Hyper-V to help simplify every aspect of a traditional server virtualization deployment. Especially important for small companies with fewer IT staff, this solution greatly reduces complexity while maintaining all application design and implementation options. Further simplifying the solution, management of the entire system is unified, but it also offers process separation that can be adequately controlled and monitored.

Cisco Cloud Solutions for EMC VSPEX with Microsoft Fast Track 3.0

The benefits of private clouds have not been easy to attain in smaller configurations. The Cisco Solution for EMC VSPEX with Microsoft Fast Track 3.0 is specifically designed for smaller cloud implementations Often the installation of cloud technologies requires the purchase of a large amount of management infrastructure to

provide the benefits expected. To reduce this cost, Cisco offers both small and medium-sized versions of this solution. With the improved built-in management capabilities of Microsoft Windows Server 2012, the improved Microsoft Hyper-V hypervisor that comes with it, and the Cisco UCS PowerTool PowerShell module, small businesses and branch offices of larger businesses can now gain some of the benefits of cloud technologies. With the medium-sized version, Microsoft System Center management, which is integrated with both Cisco UCS and EMC management, eases cloud computing for medium-sized businesses and remote offices of larger companies.

Cisco Virtualization Solution for EMC VSPEX with Microsoft Windows Server 2012 R2 Hyper-V for Up to 1000 Virtual Machines

The Cisco Solution for EMC VSPEX with Microsoft Windows Server 2012 R2 Hyper-V for Up to 1000 Virtual Machines, with support for 300, 600, and 1000

Cisco Virtualization and Cloud Solutions

We speed and simplify your virtualization and cloud computing solutions

virtual machines, uses Cisco UCS blade servers–a platform that combines high-performance computing, networking, virtualization, and storage-access resources into a single unified system that can scale to support virtualization requirements–together with next-generation EMC VNX storage. The servers, network, and storage resources are integrated with Cisco UCS 6248UP 48-Port Fabric Interconnects The embedded Cisco UCS Manager manages all blade servers and integrates transparently with Microsoft Hyper-V and System Center for simplified provisioning of virtual machines. Cisco UCS can also be managed using the Cisco UCS PowerTool Library module for Microsoft PowerShell and, across geographic locations, with Cisco UCS Director.

VMware vSphere Solutions
Cisco Virtualization Solutions for EMC VSPEX with VMware vSphere 5.1 for 50 Virtual Machines
The Cisco Solution for EMC VSPEX VMware vSphere 5.1 for 50 Virtual Machines delivers an end-to-end, best-in-class virtualization solution for efficiently virtualizing up to 50 virtual machines using VMware

vSphere 5.1 to help simplify server virtualization deployments for small companies. This solution greatly reduces complexity while maintaining all application design and implementation options. Further simplifying the solution, management of the entire system is integrated with VMware vCenter, with process separation that can be centrally controlled and monitored.

Cisco Virtualization Solutions for EMC VSPEX with VMware vSphere 5.1 for 100 or 125 Virtual Machines
The Cisco Solution for EMC VSPEX VMware vSphere 5.1 for 100 or 125 Virtual Machines is designed to bring the value of virtualization and cloud computing–lower TCO; increased resource utilization; and reduced footprint, power, and cooling–to small to medium-sized businesses with the need for, typically, fewer than 125 virtual machines. This solution uses VMware vSphere and VMware vCenter to provide virtualization and management. This solution has been validated with both Fibre Channel attached storage and iSCSI attached storage designs. For this solution, the storage is directly attached to the Cisco UCS fabric interconnect rather

than introducing additional SAN components. This approach reduces both the complexity of the solution and the costs.
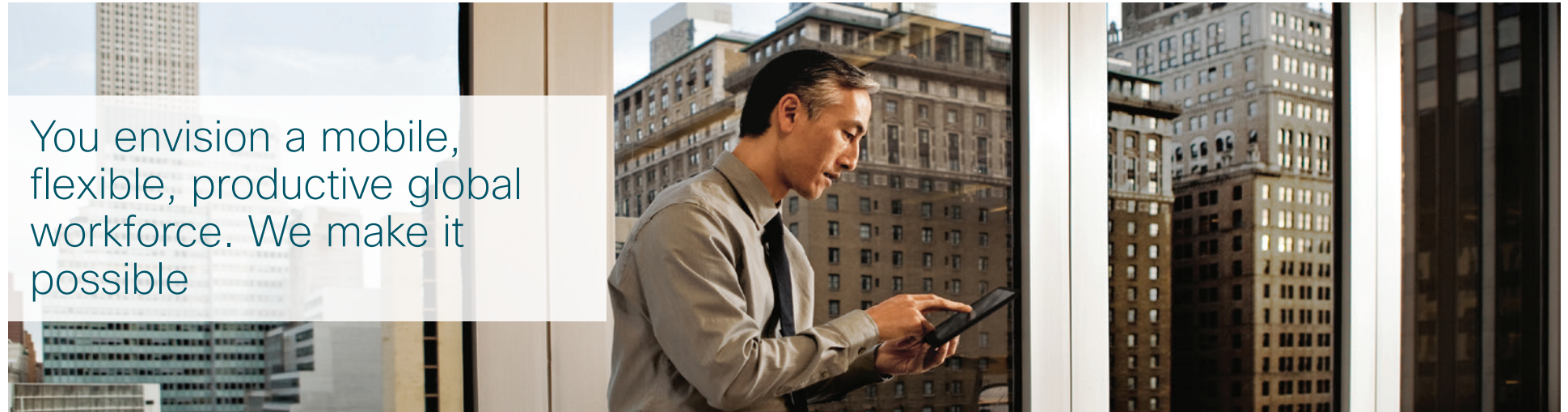
Cisco Virtualization Solution for EMC VSPEX with VMware vSphere 5.1 for 250 Virtual Machines
More businesses are moving their applications to a services-based and consolidated computing, networking, and storage environment. The Cisco Solution for EMC VSPEX with VMware vSphere 5.1 for 250 Virtual Machines replaces the complexity of the traditional deployment model, which required configuration of every component, with a model that integrates management capabilities into VMware vCenter. The Cisco Solution for EMC VSPEX with VMware V250 architecture:

- Provides an IT-as-a-service (ITaaS) solution to efficiently virtualize up to 250 virtual machines for a variety of application workloads

- Provides an end-to-end virtualization solution to use the capabilities of the unified infrastructure components

Cisco Solutions for EMC VSPEX for Desktop Virtualization

You envision a mobile, flexible, productive global workforce. We make it possible

Cisco Solution for EMC VSPEX with VMware vSphere 5.1 for Up to 1000 Virtual Machines
For larger virtualization deployments, the prevalidated Cisco Virtualization Solution for EMC VSPEX with VMware vSphere 5.1 brings the right balance of computing, networking, and storage resources to support the scaling of virtual workloads from 300, to 600, or up to 1000 virtual machines. This solution uses Cisco UCS B-Series Blade Servers and Cisco UCS C-Series Rack Servers powered by the Intel Xeon processor E5-2600 v2 family, and next-generation EMC VNX storage all integrated with a

Cisco UCS published the industry's first and best VMware VDImark results using the versatile Intel Xeon processor E5-2600 v2 family.

http://www.cisco.com/en/US/prod/collateral/ps10265/le_41705_pb_firstvdimark.pdf

Cisco UCS 6248UP 48-Port Fabric Interconnect to simplify deployment of highly scalable virtualization and cloud environments. The embedded Cisco UCS Manager manages both rack and blade servers and integrates transparently with VMware vCenter for simplified provisioning of virtual machines. Cisco UCS can also be managed using the Cisco UCS PowerTool Library module for Microsoft PowerShell and, across geographic locations, with Cisco UCS Director.

Cisco Solutions for EMC VSPEX for Desktop Virtualization

Today, the predominant end-user computing model of one or more PCs, laptops, tablets, and smartphones per staff member, is a highly distributed and expensive model to manage. To address these difficulties with end-user computing and also build on the growing benefits and knowledge of virtualization in the data center, companies are moving to a virtualized desktop delivery model. Desktop virtualization enables desktop computing managers to centralize all desktop

management and secure desktop data while also providing and excellent user experience anytime, anywhere, and on any device. All Cisco Solutions for EMC VSPEX for desktop virtualization use industry-leading bootup, login, and start-work times, without exhausting system resources. Managed by Cisco UCS Manager, Cisco UCS blade servers are multipurpose servers that can be repurposed automatically at different times of the day to best support business workloads and requirements. For example, parts of the Cisco desktop virtualization infrastructure can be taken offline during periods of low utilization (night) and the servers repurposed and used for testing or business analytics; this infrastructure can then be brought back online for desktop systems before most users come to work. Cisco UCS can perform this change faster than any other solution because it takes only minutes to provision a system. This speed translates to increased business agility and high utilization of data center assets.

Cisco Solutions for EMC VSPEX for Desktop Virtualization

VMware Horizon View Solutions

Cisco Solution for EMC VSPEX End-User Computing with VMware View 5.1.2 for 500 Users

The Cisco Solution for EMC VSPEX End-User Computing with VMware View 5.1.2 for 500 Users is especially practical for small and medium-sized companies that use VMware vSphere for server virtualization and cloud initiatives and that want an all-VMware solution. This solution allows IT departments to use current skills, simplifying desktop virtualization deployment and ongoing management.

The Cisco VSPEX End-User Computing with VMware View 5.1.2 for 500 Users reference architecture uses VMware Horizon View 5.1.2 to provide the virtual desktop infrastructure (VDI). It is designed to support up to 500 virtual desktops.

Cisco Solution for EMC VSPEX End-User Computing with VMware View 5.1.2 for 2000 Users

Like the 500-user solution, the Cisco Solution for EMC VSPEX End-User Computing with VMware View 5.1.2 for 2000 Users is practical for larger companies that use VMware vSphere for server virtualization and cloud initiatives and that want an all-VMware solution.

The Cisco Solution for EMC VSPEX End-User Computing with VMware View 5.1.2 for 2000 Users reference architecture uses VMware Horizon View 5.1.2 to provide the VDI. It is designed to support up to 2000 virtual desktops.

Citrix XenDesktop Solutions

Cisco Solution for EMC VSPEX End-User Computing with Citrix XenDesktop 5.6 for 500 Users

The Cisco Solution for EMC VSPEX End-User Computing with Citrix XenDesktop 5.6 for 500 Users is also practical for companies that use VMware vSphere for server virtualization and cloud initiatives because it

too use the VMware vSphere hypervisor. This solution allows IT departments to use current skills, simplifying desktop virtualization deployment and ongoing management.

This Cisco VSPEX End-User Computing with Citrix XenDesktop 5.6 for 500 Users reference architecture deploys Citrix XenDesktop 5.6 and is designed to support 500 virtual desktops.

Our desktop virtualization solutions enhance user experience from any device, anywhere.

182 is the number of Citrix XenDesktop Microsoft Windows 7 virtual desktops that can run on a single Cisco UCS B200 M3 Blade Server.

(Based on measurements made by Cisco in its engineering laboratories).

Cisco Solutions for EMC VSPEX Microsoft SharePoint

You need make sharing easy.
We make sharing between up
to 5000 users possible

Table 1. Small, Medium-Sized, and Large Microsoft SharePoint Solution Components

Solution Component	Small	Medium-Sized	Large
Workload	500 users with 10% concurrency	2500 users with 10% concurrency	5000 users with 30% concurrency
Servers (The number of servers can be sized up or down depending on workload.)	Managed blade server solution: 4 Cisco UCS B200 M3 Blade Servers with Cisco UCS VIC 1240 Unmanaged rack server solution: 4 Cisco UCS C220 M3 Rack Servers with Cisco UCS VIC 1225		
Processors	2 Intel Xeon processors E5-2650 at 2.0 GHz (16 cores) with 64 GB of memory		
Networking	Managed blade server solution: 2 Cisco UCS 6248UP 48-Port Fabric Interconnects Unmanaged rack server solution: 2 Cisco Nexus 3048 Switches		
Storage	EMC VNXe3300 (EMC VNXe3150 storage can be used for smaller workloads.)		

Cisco Solutions for EMC VSPEX for Microsoft SharePoint

Cisco and EMC have created a prevalidated, simplified, and flexible infrastructure to support Microsoft SharePoint 2010 running on Microsoft Windows Server 2008 R2 Hyper-V or VMware vSphere. Cisco UCS with Microsoft SharePoint 2010, EMC storage, and a choice of hypervisors together help small and medium-sized businesses quickly lower TCO, reduce complexity, and improve operation efficiency. Joint validation has shown that the solution can support 500, 2500, and 5000 users with 10, 10, and 30 percent concurrency, respectively, using the configurations detailed in Table 1. All the designs support high availability through server redundancy.

Conclusion

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Cisco Solutions for EMC VSPEX combine industry-leading components to deliver industry-leading solutions for companies of all sizes. These reference architectures are prevalidated and purpose-built to provide simplified, scalable, and flexible virtual cloud, desktop virtualization, and virtual application environments. These solutions are based on Cisco Validated Designs, delivering trusted, scalable, and predictable solutions. Cisco Solutions for EMC VSPEX are simple, efficient, and flexible.

For More Information

- Cisco Solution for EMC VSPEX with Microsoft Windows Server 2012 Hyper-V for 50 Virtual Machines http://www.cisco.com/en/US/docs/unified_computing/ucs/UCS_CVDs/ucsvspex_hyperv.pdf

- Cisco Solution for EMC VSPEX with Microsoft Fast Track 3.0 http://www.cisco.com/en/US/docs/unified_computing/ucs/UCS_CVDs/ucs_vspex_msftsm.pdf

- Cisco Solution for EMC VSPEX with VMware vSphere 5.1 for 100 or 125 Virtual Machines http://www.cisco.com/en/US/docs/unified_computing/ucs/UCS_CVDs/ciscosol_vspex_v100v125.pdf

- Cisco Solution for EMC VSPEX with VMware vSphere 5.1 for 250 Virtual Machines http://www.cisco.com/en/US/docs/unified_computing/ucs/UCS_CVDs/ucs_vspex_250vm.pdf

- Cisco Solution for EMC VSPEX End-User Computing with VMware View 5.1.2 for 500 Users http://www.cisco.com/en/US/docs/unified_computing/ucs/UCS_CVDs/ucs_vspex_vview500.pdf

- Cisco Solution for EMC VSPEX End-User Computing with VMware View 5.1.2 for 2000 Users http://www.cisco.com/en/US/docs/unified_computing/ucs/UCS_CVDs/ucs_vspex_vview2000.pdf

- Cisco Virtualization Solution for EMC VSPEX with VMware vSphere 5.1 for Up to 1000 Virtual Machines http://www.cisco.com/en/US/docs/unified_computing/ucs/UCS_CVDs/ucs_vspex_vmwpc_51.html

- Cisco Solution for EMC VSPEX End-User Computing with Citrix XenDesktop 5.6 for 500 Users http://www.cisco.com/en/US/docs/unified_computing/ucs/UCS_CVDs/ucs_vspex_c500.pdf