Solve the Desktop Crisis with Cisco Desktop Virtualization Solution with VMware View

Cisco and VMware: Virtualizing the Desktop

The traditional approach to managing desktops in a global enterprise has become untenable. Increasingly, geographically dispersed user endpoints, in the form of desktop and laptop computers and personal devices, are making "desktop" management and security nearly impossible. Operating costs are increasing dramatically as IT departments struggle with the security and operational challenges of distributed equipment and the sensitive data it contains. As IT departments consider the cost of upgrading equipment to accommodate Microsoft Windows 7, they are prompted to act.

Desktop virtualization technology has matured significantly since the last major desktop transformation, and organizations recognize that moving to a centralized desktop infrastructure is a strategic move that can help them regain control over their desktop environments, rein in costs, and establish a consistent user experience across a wide range of devices. This document describes how the Cisco® Desktop Virtualization Solution with VMware View allows organizations to regain control while eliminating the guesswork from the implementation of a strategic desktop infrastructure.

The Challenge: Desktop Cost and Complexity

The cost and complexity of managing desktops distributed across a global enterprise is increasing dramatically. IT departments are challenged by the need to deploy and constantly update hundreds, or even thousands, of desktop and laptop computers and mobile devices across a global infrastructure. IT departments also face the daunting task of migrating to Microsoft Windows 7. This migration involves upgrading to the new operating system and to new application versions across a wide range of disparate systems that may not meet the operating system's minimum hardware requirements. At the same time, users continue to demand a greater number of applications and the capability to access them anywhere, at any time, and on the device of their choice.

IT departments are struggling to regain control over data distributed across user desktop and laptop computers. Their ability to control this data can determine their ability to comply with industry and government regulations. The need to improve control over desktop infrastructure and services, combined with the need to rein in the expanding costs of maintaining a personal computer for each employee, has made desktop virtualization an unavoidable priority for many companies.

As organizations reevaluate their desktop strategies, they recognize that change is difficult. They must juggle two competing requirements: the users' need for access, high-performance experience,

choice, and flexibility, and the IT department's need for increased security and compliance, a scalable cost-effective infrastructure, and an agile approach that will quickly meet business requirements.

Cisco Desktop Virtualization Solution with VMware View

The Cisco Desktop Virtualization Solution with VMware View addresses the challenges confronting IT departments. This solution from Cisco and VMware enables IT departments to regain control of their desktop environments (Figure 1) by helping them:

- Take control over desktop and data security
- Gain superior, agile control over desktop operations
- Provide an uncompromised user experience
- Regain control over total cost of ownership (TCO)

Figure 1.   IT Departments Regain Control over Desktop Security, Operations, and Costs While Providing an Uncompromised User Experience

The Cisco Desktop Virtualization Solution is delivered as part of the Cisco Virtualization Experience Infrastructure (VXI), providing an open, end-to-end, service-optimized infrastructure for workplace virtualization together with our primary industry partners.

This solution combines VMware's virtualization leadership with the first hardware platform designed specifically to support virtual environments, the Cisco Unified Computing System™. The solution from Cisco and VMware allows IT departments to deliver exceptional desktop data security, superior desktop scalability and management, and substantial reductions in TCO, while preserving a near-native usability experience for the user. The Cisco Desktop Virtualization Solution with VMware View enables IT departments to regain control of and security over desktops and associated data with simplified, integrated management, helping companies meet business and regulatory requirements and reduce risk. Corporate user data is secured, protected, and available to users anywhere, at any

time, with both online and offline desktop access and a level of continuity not previously available, enabling increased staff productivity.

VMware View running on the Cisco Unified Computing System speeds desktop deployment and scales with business needs. Flexible, just-in-time provisioning and integrated policy-based management support a mobile workforce while increasing control and utilization of corporate infrastructure resources. IT departments can define quality of service (QoS) for individual or groups of desktop systems and automatically balance desktop workloads across the infrastructure, providing an excellent user experience.

The Cisco Desktop Virtualization Solution with VMware View is designed to help businesses regain control of desktop deployment and management costs. Desktop deployments with this radically simplified architecture reduce complexity by reducing the number of components that need to be purchased, powered, cooled, configured, managed, and secured by about one-third compared to other centralized and decentralized desktop solutions (Figure 2). Centralizing desktops greatly improves management efficiency, and integration between Cisco UCS Manager and VMware View and a simplified, single point of management helps further reduce operating costs.

Figure 2.   Traditional Infrastructures Increase Complexity and Management Interfaces, and Use of the Radically Simplified Cisco Unified Computing System as the Foundation for Desktop Virtualization Reduces the Number of Components and Management Interfaces Required to One

The solution keeps storage costs under control using optimization capabilities, including data deduplication and tiered storage. Tiered storage places essential data on high-speed storage, and older, less frequently accessed data on slower, less-expensive storage, significantly decreasing total storage costs.

Not all solutions can make desktop virtualization viable from a cost perspective. Traditional architectures are complex, incorporating a large number of discrete components that must be assembled manually and purchased at the start, resulting in a "pay now, pay later" cost model. In contrast, organizations can deploy the Cisco Desktop Virtualization Solution with VMware View with a modular set of building blocks that allow it to be implemented easily and with lower cost, scaling incrementally and cost effectively as more of the organization's users are moved to the centralized desktop model.

Industry-Leading Control over Desktop Security

Securing traditional desktop and laptop computers can be difficult, or impossible, in today's decentralized environments. The Cisco Desktop Virtualization Solution with VMware View enables greater control over desktop and laptop environments and provides the end-to-end infrastructure to support them. No other solution offers virtualization-aware networking with the innovative Cisco VN-Link technology as well as consistent operating system protection through the VMware VMsafe Initiative. Greater security helps increase staff productivity, reduces the risk of compromised corporate or customer data, and increases ease of compliance with IT best practices and industry and government regulations.

Centralizing desktop data and management using a virtual desktop infrastructure (VDI) solution with VMware View enables users to have access to their desktop environments from anywhere at any time, while IT departments maintain control of valuable corporate assets. The Cisco Desktop Virtualization Solution with VMware View is the foundation for control over campus, mobile, remote-office, offshore, and consultant environments, which are created, provisioned, and updated in the data center. It also keeps user and corporate data in the data center instead of on the desktop device, which substantially reduces the risk of compromised, lost, or corrupted data. It also helps ensure that the data is managed and protected consistently and reliably.

Gain Visibility into the Virtual Network with Cisco VN-Link Technology

One disadvantage of virtualization technologies is that they incorporate a virtual switch to handle traffic from virtual desktops. The switch prevents traffic from being seen or managed in a way consistent with the physical network, adding complexity and insecurity to the environment. Cisco VN-Link technology, working together with VMware vSphere software, provides exceptional visibility and control over the virtual network links that connect each virtual desktop's virtual network interface cards (vNICs; Figure 3). This unique combination of technologies brings the security of a physical network directly to each virtual desktop and scales this security thousands of times across the virtual desktop infrastructure. No other vendor can offer the same level of security on a per-virtual machine basis.

Figure 3.   Desktop Virtualization with Cisco VN-Link Technology Using the Cisco Nexus 1000V Switch

Protect Desktops at the Hypervisor Level with VMware VMsafe Initiative

At the virtual desktop level of the stack, the VMware VMsafe Initiative enables efficient use of desktop protection software, such as antivirus software. The VMware VMsafe Initiative allows trusted partners to run a protection engine at the hypervisor level to screen out viruses and other malware before they reach the desktop (Figure 4). Instead of having to update protection software for every virtual desktop, IT departments can implement centralized updates in one place and distribute them only to the VMware vSphere servers. This exceptional control and security of user data and applications dramatically simplifies desktop management and significantly reduces the need for service calls.

Figure 4.   VMware VMsafe Initiative Enables Efficient Protection of All Virtual Desktops

Maintain Compliance with VMware View Templates and Cisco Service Profiles

Virtual desktop environments cause a proliferation of virtual machines that can overwhelm an IT department using a traditional virtual desktop solution. The Cisco Desktop Virtualization Solution with VMware View automates the process of scaling infrastructure, from the hardware stack to individual

virtual desktops. Now IT departments can consistently create and manage their virtual desktop infrastructure in a way that maintains compliance with IT best practices, industry guidelines, and government regulations. The solution makes this possible through the integration of three technologies (Figure 5):

- Cisco service profiles automate the process of scaling the physical infrastructure, configuring every aspect of the hardware stack, including firmware, in minutes. Now IT departments can perform scaling rapidly to meet workload requirements or support additional users, without worrying about errors that can make a system noncompliant.
- VMware View templates speed desktop provisioning by automating the process of creating consistent, compliant clones of a well-defined master, or golden, image configuration. This automation helps organizations rapidly scale up to support additional users.
- Cisco port profiles combined with VMware port groups define and maintain the per-virtual machine network configuration so that each virtual desktop remains secure regardless of its physical location.

Figure 5.   Cisco Service Profiles and VMware View Templates Scale the Virtual Desktop Infrastructure While Helping Ensure Compliance

Superior Control and Agility of Desktop Operations

IT departments recognize that migrating to a new OS version provides an excellent opportunity to transition to virtual desktop computing. The solution from Cisco and VMware supports the natural process of migrating users - one group at a time - with a solution that radically simplifies the deployment of new virtual infrastructure and the virtual desktops that run on them. Now organizations can reduce the time needed to deploy virtual desktops for new employees or contractors, completing the entire process in minutes rather than the weeks it can take to purchase, provision, and deploy a physical desktop solution.

Change is a constant for IT departments, whether to keep up with the changing user landscape due to growth, mergers, and acquisitions; migrate users to Microsoft Windows 7; or mitigate outages to meet service-level agreements (SLAs). The Cisco and VMware solution dramatically speeds policy-based deployment and enables just-in-time provisioning of both virtual desktops and the underlying Cisco Unified Computing System infrastructure. After VMware View templates have been configured,

provisioning of multiple desktops from the same template is a trivial task. Similarly, with Cisco service profile templates, after a template has been set up, the same template can be applied to each new server, helping ensure consistent configuration and policy. These capabilities together result in simplified, consistent desktop management with fewer service calls.

Standardize Hardware Provisioning with Point-and-Click Simplicity

At the hardware-infrastructure level, Cisco service profiles contain all of the information needed to fully define and provision a server and its I/O properties. This information includes storage RAID levels, BIOS settings, firmware revisions and settings, adapter identities and settings; VLAN and VSAN network settings, and network QoS settings (Figure 6). These profiles can be used to quickly provision or reprovision the hardware infrastructure - in minutes - eliminating the need to dedicate servers to specific functions or departments.

Figure 6.   Cisco Service Profiles Define a Server and Its I/O Settings in Minutes

Simplify and Centralize Desktop Management with VMware View Linked Clones and ThinApp

At the virtual layer, VMware View Composer, through VMware View Manager, is used to create a parent image, or template, for desktop systems that have similar base configurations. From this parent image, each desktop can be customized using linked clones, which track deviations from the parent image (Figure 7). The extent to which desktops can be customized is controlled centrally, through VMware View Manager. Desktops access centrally managed and updated applications through VMware ThinApp, which streams an application master to each desktop using the application. This process centralizes and simplifies the management of both desktop base operating systems and the associated applications.

Figure 7. VMware View Templates Are Composed of a Parent Image and Linked Clones

Automate Desktop Operations with Virtualization-Aware Infrastructure

The Cisco Desktop Virtualization Solution with VMware View dynamically balances desktop workloads across the server and network infrastructure, providing excellent resource utilization and policy-based resource access. Within the Cisco Unified Computing System, all I/O traffic is automatically balanced to deliver both network and storage access without the need for additional switching components. VMware View balances the virtual desktop workloads across the system's servers, enhancing memory and computing resource utilization and desktop performance. When a virtual desktop migrates from one Cisco UCS server to another, Cisco VN-Link technology in

combination with VMware vSphere moves all the necessary network profile information with the virtual desktop to reduce human interaction and preserve security and network QoS settings (Figure 8).

Figure 8.   Cisco VN-Link Technology and VMware vSphere Together Help Ensure Virtual Desktop Security and Network QoS Through the Migration Process Without Human Intervention

Reduce Storage Use by Up to 60 Percent with Advanced Storage Capabilities

One of the perceived disadvantages of moving from a distributed desktop model to a centralized virtual desktop model is the movement of user data from the cheapest storage available (in the desktop or laptop computer) to more expensive networked storage in the data center. To mitigate this problem, VMware View integrates both policy-based tiered storage and data deduplication. Policy-based storage tiering moves older, less frequently accessed data to inexpensive online storage repositories. Data deduplication removes multiple copies of the same data, replacing the copies with links to the single copy and so reducing the total amount of data by as much as 60 percent. These capabilities provide optimal desktop data and storage capacity management and keep active user data instantly available for cost-effective data access.

Increase Density and Scalability

The Cisco Desktop Virtualization Solution with VMware View increases desktop consolidation ratios through industry-leading Cisco Extended Memory Technology and VMware's advanced memory management. With newer operating system releases making greater memory demands than ever, higher density and lower per-server costs can be achieved only with more memory. Cisco Extended Memory Technology supports the largest amount of memory (384 GB) of any 2-socket blade server powered by Intel Xeon processors. The technology also supports a cost-effective 192-GB memory configuration that uses low-cost 4-GB DIMMs.

The solution's virtual desktop infrastructure is based on two-socket Cisco UCS B250 M2 Extended Memory Blade Servers. If IT departments need greater desktop performance and scalability, four-

socket Cisco UCS blade servers can be deployed. Additionally, every Cisco Unified Computing System is designed to support, under a single management interface, up to 320 physical servers for massive scalability. On top of this foundation, VMware View is optimized and tuned to support thousands of users, handling boot storms easily.

Uncompromised User Experience

If a centralized, virtualized desktop is going to be successful, it cannot hinder staff productivity. The Cisco Desktop Virtualization Solution with VMware View does not compromise the user experience. This solution provides a near-native usability experience for the end user. This experience is achieved using capabilities such as online and offline access, location-based printing, automatic redirection of USB input, and high-performance graphical rendering. These capabilities are enabled using the Cisco Unified Computing System platform's lossless, low-latency, high-bandwidth unified fabric and high-performance, scalable memory computing.

Enable High-Performance Graphical Rendering, Location-Based Printing, and USB Access

The Cisco Desktop Virtualization Solution with VMware View delivers uncompromised usability for end users, with support for graphics and rich media such as video and Adobe Flash content. In addition, the solution supports the capability to connect up to four monitors to a single virtual desktop, addressing multiple-monitor requirements similar to the way they would be addressed from a local desktop or laptop system. Users expect to use local printers and USB devices, and this capability can be enabled, depending on security policy, on a per-person or per-group basis, for consistent management of local data accessibility. The VMware PC-over-IP (PCoIP) display protocol enables all these features and is the first protocol designed specifically to provide an uncompromised remote-desktop experience.

Provide Both Online and Offline Desktop Access

Not all users have the capability to be connected to the network 100 percent of the time. For users who need to disconnect from the network but still need to access their desktops, the Cisco and VMware solution offers VMware View Client with Local Mode. With Local Mode, an encrypted virtual desktop is streamed from the data center to the local system, giving the user full access to the working environment. When the local system is reconnected to the network, all changes are automatically synchronized with the virtual desktop residing in the data center. All IT desktop policies can be extended to the Local Mode desktop, enhancing data security. The capability to provide offline virtual desktops enables IT departments to manage secure desktops centrally, extending policies to local devices, while users gain access their desktops anywhere and at any time.

Benefit from Cisco's Networking Leadership

High-performance servers and end-to-end networking - LAN, WAN, security, and mobility - are essential for any successful virtual desktop solution. These capabilities can dramatically improve the cost-effective, bandwidth-efficient delivery of high-quality concurrent virtual desktop sessions over the enterprise-wide infrastructure. Cisco Application Networking Services such as Cisco Wide Area Application Services (WAAS) and Cisco Application Control Engine (ACE) along with Cisco Adaptive Security Appliances (ASA) can enhance and complete the solution for scalable, end-to-end delivery of virtual desktops. Customers can benefit from Cisco's networking industry leadership in providing best-in-class end-to-end connectivity for fast, scalable, and secure virtual desktop solutions across distances and a variety of network media.

Restored Control over Desktop Costs

The Cisco Desktop Virtualization Solution with VMware View allows IT departments to regain control of the capital expenditures and operating costs associated with desktop environments. Centralizing desktop systems simplifies management of the desktop environment, enabling uniform business policies and best practices to be applied consistently across the environment. This solution, with its radically simplified architecture and integrated management, enables just-in-time provisioning of desktops to further reduce TCO.

Reduce Costs Through Radically Simplified Architecture

The simplified architecture of the Cisco Desktop Virtualization Solution with VMware View dramatically reduces - by up to 60 percent - the number of adapters and devices that need to be purchased, powered, cooled, configured, managed, and secured compared to other centralized and decentralized desktop deployments. The solution's integrated, simplified management capabilities improve IT productivity and reduce the likelihood of costly errors. The combined solution also reduces costs associated with centralized networked storage; it enables the use of multiple tiers of storage, with infrequently accessed files moved to inexpensive storage repositories, greatly reducing storage costs.

Improve Operation Efficiency

Transitioning from a decentralized to a centralized virtual desktop environment increases operation efficiency, control, compliance, and security. The solution from Cisco and VMware streamlines desktop operations with integrated management and configure-once templates, reducing the amount of time administrators spend deploying, monitoring, and managing each desktop, and enabling administrators to support more desktops. Policy-based deployment reduces errors and associated service calls, significantly reducing operating costs.

Increase Revenue as Employees Become More Productive

With the Cisco and VMware solution, employees are more productive because they are not experiencing outages. When physical desktop or laptop computers fail, it can take days or weeks before users regain access to their systems and data. In contrast, the Cisco Desktop Virtualization Solution with VMware View provides desktop continuity and high availability for optimal productivity.

Simplified, Modular Deployments

Any large project that affects most, or all, personnel should be implemented in phases. Cisco enables simplified, modular deployment of the Cisco Desktop Virtualization Solution with VMware View by packaging the infrastructure as a set of building blocks that can be deployed incrementally. A Cisco Validated Design based on rigorous testing at scale is used to define every element of the modular building blocks, accelerating solution deployment while providing a simplified path for growth. With this approach, IT departments can start with an initial desktop virtualization implementation or proof of concept. The solution is based on two packages (Figure 9): the Starter Pack and the Expansion Pack for VDI-Based Desktops.

Figure 9. Cisco Desktop Virtualization Solution with VMware View Is Delivered as Two Packages: The Starter Pack and the Expansion Pack for VDI-Based Desktops

- Cisco UCS Starter Pack for Desktop Virtualization: This package establishes the core of the solution with servers optimized to support VMware View management software and an initial virtualization cluster with support for about 300 desktops. The package includes two Cisco UCS 6100 Series Fabric Interconnects with downloadable, preconfigured Cisco service profiles. After the profiles have been downloaded, just a few parameters remain to be set by administrators. The package includes two Cisco UCS 5108 Blade Server Chassis each equipped with two Cisco 2104XP Fabric Extenders for unified I/O connectivity. One chassis is populated with servers, and the second chassis is provided for expansion and to eliminate the chassis as a single point of failure. The package includes two Cisco UCS B200 M2 Blade Servers to support VMware View management functions. Each Cisco UCS B200 M2 is equipped with 48 GB of memory, and the pack¬age allows Intel Xeon processors and mezzanine cards to be specified when it is ordered. The package includes three Cisco UCS B250 M2 Extended Memory Blade Servers, each with 192 MB of memory and with configurable processors and mezzanine cards.

- Cisco Expansion Pack for VDI-Based Desktops: This package increases the solution's capacity to support desktop virtualization. It expands the virtualization cluster by adding four Cisco UCS B250 M2 servers equipped with 192 GB of memory at a clock speed of 1333 MHz. These are housed in a Cisco UCS 5108 chas¬sis equipped with two Cisco UCS 2104XP Fabric Extenders. Multiple expansion packs can be ordered to scale even further.

Packaging the solution as a set of building blocks makes it easy to customize the Cisco Virtual Desktop Solution with VMware View to best meet organizational requirements, while taking advantage of Cisco's experience that is codified in the solution's predefined components. The solution offers a unified support model that gives customers a single number to call for any concern that arises, regardless of whether its origin is hardware or software.

Cisco Virtualization Experience Infrastructure

The Cisco Desktop Virtualization Solution with VMware View is delivered as a proof-point of the larger Cisco VXI. Cisco VXI redefines business outcomes by architecturally binding the Cisco Collaboration, Borderless Networks, and Data Center solutions in a cohesive, services-optimized platform. Cisco VXI enables new, rich, end-to-end capabilities that go beyond the limits of desktop virtualization to deliver a fully virtualized, collaborative workplace.

Why Cisco and VMware?

The Cisco Desktop Virtualization Solution with VMware View gives control over the desktop back to IT departments - control over desktop and data security, control over desktop operations, and control over operating expenses - while providing an uncompromised user experience. There are no better sources for a desktop virtualization solution than Cisco and VMware.

Cisco and VMware are market-leading, innovative companies with a long history of support for virtualization of data center resources. By combining their vision and capabilities, Cisco and VMware together offer customers powerful allies for designing and implementing their next-generation virtual desktop capabilities. Together, Cisco and VMware deliver a standards-based, cohesive, unified environment that easily scales to meet the needs of the business while reducing TCO.

The collaboration between these two companies brings you scalable desktop capacity and resource reuse, enabled though holistic management automation, increasing human and resource efficiency and reducing errors and downtime. With Cisco and VMware technologies, new desktops can be securely brought online in minutes rather than weeks or months, and desktop resources can automatically scale up or down to meet business requirements, reducing energy consumption. The combination of Cisco and VMware delivers an infrastructure that speeds desktop delivery, increases security, and improves desktop availability and the user experience for local and remote desktop access, both online and offline, without compromising control over the solution's TCO.

For More Information

- Cisco Desktop Virtualization Solution with VMware View: http://www.cisco.com/go/vmware
- Cisco Unified Computing System: http://www.cisco.com/go/ucs
- VMware View: http://www.vmware.com/view
- Cisco Desktop Virtualization Solutions: http://www.cisco.com/go/vdi
- Cisco Virtualization Experience Infrastructure: http://www.cisco.com/go/vxi

For more information, visit: **www.vmware.com**