

# Cisco Desktop Virtualization Solutions: Data Center



## Data Center Infrastructure for Desktop Virtualization

An agile and robust data center infrastructure is required to support desktop virtualization. The data center must provide the necessary performance, capacity, and security for desktop virtualization to deliver on its promises of simplified operations, data security, and reduced desktop TCO. Cisco provides an optimized data center infrastructure for desktop virtualization and a platform for the new workspace, working with industry leaders such as VMware, Citrix, EMC, and NetApp to address a broad set of IT and user requirements.

## Desktop Virtualization

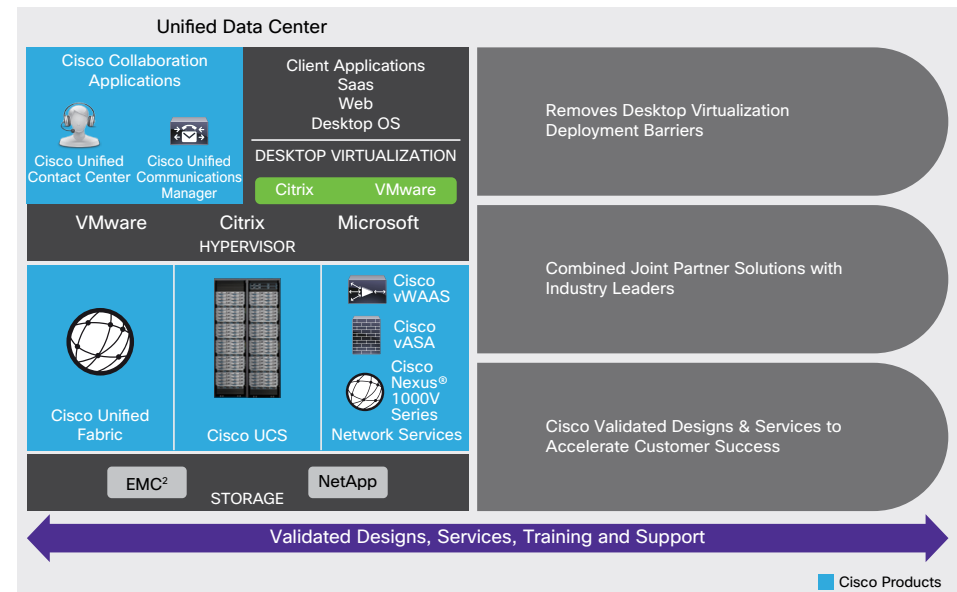
Desktop virtualization has been around for a long time, but only recently have organizations begun to deploy desktop virtualization on a broad basis and across a variety of user profiles. Increased compliance and data security needs, consumerization of IT, enterprise mobility, and the need for reduced TCO are primary reasons for the increased adoption of desktop virtualization. However, although desktop virtualization provides benefits to IT, until recently end users have not seen the same advantages. Now these users are demanding access to IT resources from a variety of devices, including smartphones and tablets of their own.

## The Evolving Workplace

Today's IT departments are facing a rapidly evolving workplace environment. The workforce is becoming increasingly diverse and geographically dispersed, including offshore contractors, distributed call center operations, knowledge and task workers, partners, consultants, and executives connecting from locations around the world at all times.

This workforce is also increasingly mobile, conducting business in traditional offices, conference rooms across the enterprise campus, home offices, on the road, in hotels, and at the local coffee shop. This workforce wants to use a growing array of client computing and mobile devices that they can choose based on personal preference. These trends are increasing pressure on IT to ensure protection of corporate data and prevent data leakage or loss through any combination of user, endpoint device, and desktop access scenarios (Figure 1). These challenges are compounded by desktop refresh cycles to accommodate aging PCs and bounded local storage and migration to new operating systems, specifically Microsoft Windows 7.

Figure 1 Cisco Desktop Virtualization Solutions



Fortunately for IT, end-users, and the business itself, desktop virtualization has progressed and can now offer a near-native end-user experience on almost any device, while at the same time providing increased control, security, and lower TCO for IT and the business.

## Cisco Data Center Infrastructure for Desktop Virtualization

Cisco® Desktop Virtualization Solutions address the needs of an increasingly mobile and geographically dispersed workforce that is adopting an evolving and expanding suite of heterogeneous endpoint devices. Cisco solutions give enterprises a path to pervasive and persistent control and security of virtual desktops, applications, and data delivered through a highly scalable and rapidly deployed infrastructure while reducing costs. Cisco offers an innovative solution that addresses the evolving business IT environment, including desktop hardware refresh cycles, Microsoft Windows 7 migration, security and compliance initiatives, remote and branch offices and offshore facilities, and mergers and acquisitions.



The foundation of the Cisco Desktop Virtualization Solutions is the Cisco data center infrastructure (Cisco Unified Computing System™ [Cisco UCS®] and Cisco Nexus® Family solutions), which combines best-in-class Cisco and partner products, service offerings, and best practices to deliver a simplified, secure, and scalable solution leading to TCO savings and implementation success. Cisco offers the first end-to-end desktop virtualization solution that uses an open platform and architectural approach that includes computing, hypervisor, network, storage, security, and management resources in a single, cohesive system.

## Cisco Desktop Virtualization – Solution Architectures

Cisco and its technology ecosystem partners have developed a comprehensive portfolio of reference architectures that are aligned with specific IT environments, business considerations, and goals and address the challenges commonly associated with deployment of desktop virtualization. These four architectural approaches offer a clear path to virtual desktop deployment with:

- Lower initial cost
- Reduced system complexity, and simplified management
- Scalable performance for customers of all sizes

Built on best-in-class technologies, the four architectural approaches are **On-Board, Simplified, and Scalable Architecture for Desktop Virtualization** and **Converged Infrastructure for Desktop Virtualization**. These architectures are suited to organizations of various sizes, ranging from small and mid-sized businesses (SMBs) to large enterprises to service providers. Also, large environments can benefit from approaches that are suited for smaller environments when their immediate need is to establish a pilot or proof-of-concept (PoC) environment and prove success quickly.

## Simplified. Secure. Scalable.

Cisco focuses on three key elements to deliver the best desktop virtualization data center infrastructure and platform for the next-generation virtual workspace: simplification, security and scalability. Through this focus customers can achieve savings and success in their desktop virtualization implementations.

### Simplified

Cisco UCS provides a radical new approach to industry-standard computing and provides the core of the data center infrastructure for desktop virtualization. Among the many features and benefits of Cisco UCS are the drastic reduction in the number of servers needed and in the number of cables used per server, and the capability to rapidly deploy or reprovision servers through Cisco UCS service profiles. With fewer servers and cables to manage and with streamlined server and virtual desktop provisioning, operations are significantly simplified. Thousands of desktops can be provisioned in minutes with Cisco UCS Manager service profiles and Cisco storage partners' storage-based cloning. This approach accelerates the time to productivity for end users, improves business agility, and allows IT resources to be allocated to other tasks.

Cisco UCS Manager automates many mundane, error-prone data center operations such as configuration and provisioning of server, network, and storage access infrastructure. In addition, Cisco UCS B-Series Blade Servers and C-Series Rack Servers with large memory footprints enable high desktop density that helps reduce server infrastructure requirements.

Simplification also leads to more successful desktop virtualization implementation. Cisco and its technology partners VMware (VMware View), Citrix (Citrix XenDesktop), EMC (EMC VNX), and NetApp (NetApp FAS) have developed integrated, validated architectures,

including predefined converged architecture infrastructure packages based on Vblock™ Systems and FlexPod. Cisco Desktop Virtualization Solutions have been tested with all the leading hypervisors, including VMware vSphere, Citrix XenServer, and Microsoft Hyper-V.

### Secure

Although virtual desktops are inherently more secure than their physical predecessors, they introduce new security challenges. Mission-critical web and application servers using a common infrastructure such as virtual desktops are now at a higher risk for security threats. Inter-virtual machine traffic now poses an important security consideration that IT managers need to address, especially in dynamic environments in which virtual machines, using VMware vMotion, move across the server infrastructure.

Desktop virtualization, therefore, significantly increases the need for virtual machine-level awareness of policy and security, especially given the dynamic and fluid nature of virtual machine mobility across an extended computing infrastructure. The ease with which new virtual desktops can proliferate magnifies the importance of a virtualization-aware network and security infrastructure. Cisco data center infrastructure (Cisco UCS and Cisco Nexus Family solutions) for desktop virtualization provides strong data center, network, and desktop security, with comprehensive security from the desktop to the hypervisor. Security is enhanced with segmentation of virtual desktops, virtual machine-aware policies and administration, and network security across the LAN and WAN infrastructure.

### Scalable

Growth of a desktop virtualization solution is all but inevitable, so a solution must be able to scale, and scale predictably, with that growth. The Cisco Desktop Virtualization Solutions support high virtual-desktop



density (desktops per server), and additional servers scale with near-linear performance. Cisco data center infrastructure provides a flexible platform for growth and improves business agility. Cisco UCS Manager service profiles allow on-demand desktop provisioning and make it just as easy to deploy dozens of desktops as it is to deploy thousands of desktops.

Cisco UCS servers provide near-linear performance and scale. Cisco UCS implements the patented Cisco Extended Memory Technology to offer large memory footprints with fewer sockets (with scalability to up to 1 terabyte (TB) of memory with 2- and 4-socket servers). Using unified fabric technology as a building block, Cisco UCS server aggregate bandwidth can scale to up to 80 Gbps per server, and the northbound Cisco UCS fabric interconnect can output 2 terabits per second (Tbps) at line rate, helping prevent desktop virtualization I/O and memory bottlenecks. Cisco UCS, with its high-performance, low-latency unified fabric-based networking architecture, supports high volumes of virtual desktop traffic, including high-resolution video and communications traffic. In addition, Cisco storage partners EMC and NetApp help maintain data availability and optimal performance during boot and login storms as part of the Cisco Desktop Virtualization Solutions. Recent Cisco Validated Designs based on Citrix, Cisco UCS, and EMC joint solutions have demonstrated scalability and performance, with up to 5000 desktops up and running in 30 minutes.

Cisco UCS and Cisco Nexus data center infrastructure provides an excellent platform for growth, with transparent scaling of server, network, and storage resources to support desktop virtualization, data center applications, and cloud computing.

## Savings and Success

The simplified, secure, scalable Cisco data center infrastructure for desktop virtualization solutions saves time and money compared to alternative approaches. Cisco UCS enables faster payback and ongoing savings (better ROI and lower TCO) and provides the industry's greatest virtual desktop density per server, reducing both capital expenditures (CapEx) and operating expenses (OpEx). The Cisco UCS architecture and Cisco Unified Fabric also enables much lower network infrastructure costs, with fewer cables per server and fewer ports required. In addition, storage tiering and deduplication technologies decrease storage costs, reducing desktop storage needs by up to 50 percent.

The simplified deployment of Cisco UCS for desktop virtualization accelerates the time to productivity and enhances business agility. IT staff and end users are more productive more quickly, and the business can respond to new opportunities quickly by deploying virtual desktops whenever and wherever they are needed. The high-performance Cisco systems and network deliver a near-native end-user experience, allowing users to be productive anytime and anywhere.

The ultimate measure of desktop virtualization for any organization is its efficiency and effectiveness in both the near term and the long term. The Cisco Desktop Virtualization Solutions are very efficient, allowing rapid deployment, requiring fewer devices and cables, and reducing costs. The solutions are also very effective, providing the services that end users need on their devices of choice while improving IT operations, control, and data security. Success is bolstered through Cisco's best-in-class partnerships with leaders in virtualization and storage, and through tested and validated designs and services to help customers throughout the solution lifecycle. Long-term success is enabled through the use of Cisco's scalable, flexible, and secure architecture as the platform for desktop virtualization.

## Use Cases

- Healthcare: Mobility between desktops and terminals, compliance, and cost
- Federal government: Teleworking initiatives, business continuance, continuity of operations (COOP), and training centers
- Financial: Retail banks reducing IT costs, insurance agents, compliance, and privacy
- Education: K-12 student access, higher education, and remote learning
- State and local governments: IT and service consolidation across agencies and interagency security
- Retail: Branch-office IT cost reduction and remote vendors
- Manufacturing: Task and knowledge workers and offshore contractors
- Microsoft Windows 7 migration
- Security and compliance initiatives
- Opening of remote and branch offices or offshore facilities
- Mergers and acquisitions



## Cisco Desktop Virtualization Solutions: Infrastructure Bundles

The expanded portfolio of Cisco Desktop Virtualization Solutions provides performance- and price-optimized architectures suited to specific customer scenarios. To enable customers to easily adopt and deploy desktop virtualization, Cisco offers predefined solution bundles for both Citrix and VMware desktop virtualization scenarios. For details refer to [www.cisco.com/go/quickcatalog](http://www.cisco.com/go/quickcatalog).

## Solution Components

### Base Components

- Computing platform: Cisco UCS B-Series Blade Servers and Cisco UCS C-Series Rack Servers
- Fabric interconnects: Cisco UCS 6200 Series Fabric Interconnects
- Cisco UCS I/O modules: Cisco UCS 2200 Series Fabric Extenders
- Cisco UCS virtual interface cards (VICs): Cisco UCS VIC 1240, 1280, and 1225 and Cisco UCS M81KR VIC
- Hypervisor: VMware vSphere, Citrix XenServer, and Microsoft Hyper-V
- Virtual desktop connection broker: Citrix XenDesktop or VMware View

### Additional Solution Components

- Computing platform: Cisco UCS C-Series Rack Servers
- Cisco Unified Fabric: Cisco Nexus 7000, 5000, and 1000V Series Switches and Cisco Nexus 2000 Series Fabric Extenders
- Storage: NetApp or EMC
- Virtual machine-aware networking and security: Cisco Nexus 1000V Series Switches, Cisco Data Center Virtual Machine Fabric Extender (VM-FEX) technology, and Cisco Virtual Security Gateway (VSG)

## Additional Resources

Cisco Desktop Virtualization Solutions:

- [www.cisco.com/go/vdi](http://www.cisco.com/go/vdi)
- [www.cisco.com/go/ucs](http://www.cisco.com/go/ucs)

Cisco Desktop Virtualization Services:

- [www.cisco.com/en/US/products/ps11235\\_services\\_segment\\_service\\_home.htm](http://www.cisco.com/en/US/products/ps11235_services_segment_service_home.htm)

Cisco Validated Design for Cisco Desktop Virtualization:

- [www.cisco.com/go/vdidesigns](http://www.cisco.com/go/vdidesigns)