



Cisco Desktop Virtualization Solutions Virtual Desktop Infrastructure (VDI)

Cisco is bringing to market a portfolio of Desktop Virtualization Solutions which provides the infrastructure for various types of virtual desktop. Working together with other desktop virtualization industry leaders, Cisco is delivering solutions intended to address the broadest set of IT and user requirements. This At-A-Glance addresses virtual desktop infrastructure (VDI), which is one of the fastest growing approaches to Desktop Virtualization.

The Evolving Workplace

As IT departments seek to enable more efficient client computing environments while reducing desktop total cost of ownership (TCO), information loss, and user downtime, new challenges and opportunities are emerging. These include:

- Increasing diversity of client computing devices
- Mobile workers
- Geographically dispersed resources
- The onset of Microsoft Windows 7 migration
- Data leakage and loss prevention

These challenges are forcing organizations to look at new client computing models that meet both IT and End-User expectations, including:

- Initial purchase costs and lifecycle costs
- Control, manageability, and security
- Deployment speed and versatility
- LAN-like performance for users at remote locations
- User desktop access anywhere, anytime, and on any device
- Alignment with existing user desktop experience

What Is a Virtual Desktop?

Virtual desktop infrastructure (VDI) is the fastest growing approach to desktop virtualization, allowing IT departments to centrally host and manage user desktops on virtual machines residing in the data center. The users can access

their server-hosted virtual desktop from anywhere there is connectivity and from a broad range of end-user devices using one of several remote display protocols. VDI decouples the user's desktop computing environment from the physical hardware (PC, laptop computer, etc.). They are hosted on a data center server virtual machine and delivered across the network using a remote display protocol. The end device no longer stores the user's applications or data, which are instead housed in centralized storage residing in the data center.

The end-user device can be a:

- Traditional thick client (such as a standard PC or laptop computer)
- Thin client, which provides an optimized, lower-cost device designed specifically to interact with a hosted virtual desktop
- Display terminal that supports a keyboard, video, and mouse only, interacting with a hosted virtual desktop
- Secure corporate workspace or virtual desktop within the user's own personal PC or laptop computer: a "bring your own PC" approach (for example, for contractors)
- Tablet or smartphone that acts as a thin client

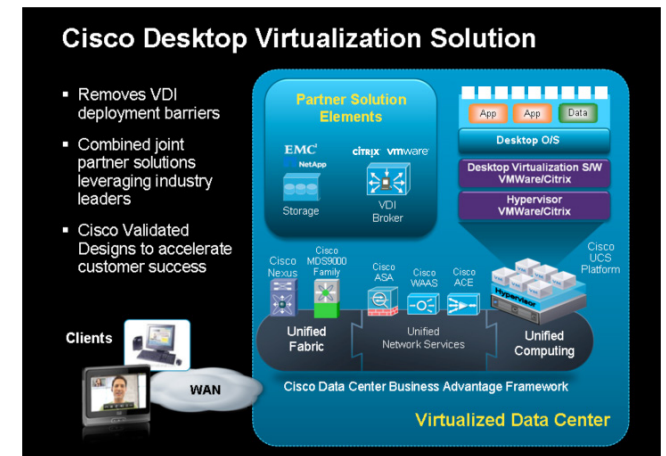
Why Is VDI Growing in Importance?

The number of companies deploying VDI is growing substantially and is estimated to exceed 50 percent today. It is estimated that there will be more than 50 million VDI endpoints by 2013. Several factors are promoting this growth:

- Increasing diversity of end-user device form factors on which business is being conducted: laptop computers, smartphones, business tablets, etc.
- Rising desktop maintenance and upgrade costs associated with OS refreshes
- Globalization and an increasingly geographically dispersed workforce that includes contractors, offshore workers, call centers, and consultants

- Availability of cost-effective and ubiquitous broadband
- Proliferation of server virtualization, creating increased density of virtual desktops deployable on an x86 server blade
- Growing trust in the cloud for business services, applications, and data access

Figure 1. Cisco's Solution for Virtual Desktop Infrastructure



What Is Cisco's Solution for VDI?

Cisco's VDI solution offerings combine with industry leading partner offerings to deliver a complete server-hosted virtual desktop infrastructure that helps IT achieve increased administrative control and data security, provide a near-native end-user computing experience, and ease the migration to newer desktop operating systems, while helping IT control OpEx and CapEx. Cisco's technologies, services, and best practices for VDI combine with partner offerings to provide an open, best-in class approach to achieving resource efficiency and control, simplified management, security, policy, and desktop delivery optimization.



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Cisco's Solution for VDI: Meeting Today's VDI Challenges

Cisco's VDI solution delivers an end-to-end solution that is differentiated from all other VDI solutions (see Fig.1):

- **Exceptional control and security of centralized desktops:** Cisco Unified Computing System™, unified network services, and VN-Link solutions provide visibility and security for the network all the way to the virtual machine. Each virtual machine is configured with the policy, security, network, and application optimization profile specific to that virtual desktop. These profiles stay with the virtual machine and desktop even as VMware vMotion moves it across the data center between virtual machine clusters, helping ensure continuous protection of the desktop and its data and applications. This behavior allows dynamic creation and simplified continued administration of virtual workgroups that require isolation from other workgroups, and enables secure access to back-end enterprise applications and resources (human resources, finance, engineering, etc).
 - Cisco ACE moves CPU-intensive SSL encryption from the server to dedicated hardware within the network, increasing hosted desktop density by up to 50 percent and increasing the number of concurrently supported remote-user sessions.
 - Cisco ASA provides integrated firewall, intrusion prevention system (IPS) and VPN features along with both client-based and clientless options for user VPN access, in support of partner VDI solutions that require an external VPN solution as a supplement to existing VDI security servers.
- **Rapid deployment and scaling of desktops:** The Cisco UCS stateless computing and service profiles operational model enables administrators to create and provision virtual desktops much faster than traditional

VDI environments, while helping ensure that computing resources are dynamically allocated to user workloads as needed.

- The patented Cisco Extended Memory Technology delivers the industry's highest ratio of virtual desktops consolidated on a single blade server, improving desktop density by as much as 60% over alternative solutions.
- Cisco UCS Manager and Cisco UCS service profiles help move new server resources from the loading dock into production, or repurpose existing server resources, in minutes rather than in the hours, days, or weeks required to provision traditional servers. This speed becomes an asset as IT departments need to move users to virtual desktops as groups are ready or as companies are acquired
- **Outstanding user computing experience:** Cisco Extended Memory Technology helps ensure that each desktop virtual machine has sufficient memory to respond to user needs.
 - Cisco Unified Fabric: VDI performance bottlenecks are often attributed to storage I/O-operations-per-second (IOPS) performance. Cisco Unified Fabric architecture provides a lossless 10 Gigabit Ethernet ultra low-latency Ethernet fabric that converges LAN and multiprotocol storage traffic, helping ensure high levels of storage array throughput and IOPS for primary and replicated user desktops, applications, and data.
 - Cisco WAAS provides a comprehensive WAN optimization solution that accelerates virtual desktop protocols including Independent Computing Architecture (ICA) and Remote Desktop Protocol (RDP), as well as application delivery to branch offices and mobile users while lowering IT costs and providing an excellent user experience. Cisco WAAS helps enable branch-office infrastructure consolidation and

reduces bandwidth demand for desktop, application, and rich multimedia delivery while maintaining user productivity and scaling the number of branch-office users.

- Print services: Print services are enabled by Cisco WAAS. Cisco's solution for VDI supports a variety of print strategies, including centralized remote network print server, standalone branch-office print server, and USB-attached printers.
- **Control of desktop TCO:** The simplified architecture, stateless computing, and service profiles operational model enables drastically reduced cycle time for provisioning of virtual desktops.
 - Cisco Unified Fabric drastically reduces the number of adapters and devices that need to be purchased, powered, cooled, configured, managed, and secured compared to other desktop deployment models.
 - Cisco Extended Memory Technology enables each server blade to deliver a high number of virtual desktops, dramatically lowering TCO.
 - Cisco WAAS and WAAS Mobile provide support for a high number of concurrent virtual desktop users over a WAN link. Cisco WAAS enables network administrators to optimize the amount of bandwidth consumed by VDI traffic and thereby more effectively manage WAN costs through a suite of Cisco WAAS technologies, including:
 - Advanced compression using data redundancy elimination (DRE) and Lempel-Ziv (LZ) compression, greatly reducing or eliminating redundant packets that traverse the WAN
 - Transport file optimization (TFO) for improved throughput and reliability for clients and servers in WAN environments
 - Application-specific accelerators (CIFS, NFS, HTTP, SSL, MAPI, and Video-RTSP); Cisco WAAS



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enhances the performance and accelerates the operation of a broad range of these chatty application protocols, improving the overall virtual desktop user experience for all these application protocols over the WAN

Use Cases

- Healthcare: Mobility between desktops and terminals, compliance, and cost
- Federal: 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

Virtual Desktop Infrastructure Solution Areas

Cisco's solution for VDI can offer attractive solutions to many business and IT challenges, including:

- Microsoft Windows 7 migration
- Security and compliance initiatives
- Opening of remote and branch offices or offshore facilities
- Mergers and acquisitions

Virtual Desktop Infrastructure Bundles

Cisco provides VDI solution bundles sized for deployments of various scales. Additional solution components (security, load balancing, WAN optimization, etc.) can be optionally added to achieve the breadth of benefits delivered by Cisco VDI.

- VDI Entry-Level Bundle: Supports hosted virtual machine-based desktops, scaling from 300 to 700 desktops
- VDI Upgrade Bundle: Supports up to 800 hosted virtual machine-based desktops
- VDI Scale Bundle: Supports up to 3000 hosted virtual machine-based desktops

Solution Components

Base Components

- Computing platform: Cisco UCS B-Series Blade Servers
- Fabric interconnect: Cisco UCS 6120XP 20-Port Fabric Interconnect
- Hypervisor: VMware vSphere 4 or Citrix XenServer
- VDI connection broker: Citrix XenDesktop or VMware View 4.5

Additional Differentiated Solution Components

- Computing platform: Cisco UCS C-Series Rack-Mount Servers
- Cisco Unified Fabric: Cisco Nexus 7000, 5000 Series Switches and Nexus 2000 Series Fabric Extenders
- Storage: NetApp or EMC
- Virtual machine-aware networking and security: Cisco Nexus 1000V Series Switches, Cisco VN-Link technology, and Cisco Virtual Firewall
- Network security: Cisco ASA Adaptive Security Appliances
- WAN optimization: Cisco Wide Area Application Services (WAAS) and Virtual WAAS (vWAAS)
- Server load balancing: Cisco Application Control Engine (ACE)
- SAN: Cisco MDS 9500 Series Multilayer Directors

Cisco Services

- VDI Strategy Service
- VDI Planning and Design Service

Next Steps

Desktop virtualization project leaders should consider the following approach in undertaking the implementation of a hosted virtual desktop solution:

- Define end-state user experience strategy: What will the service delivery strategy look like in 5 years? Engage business, IT, and communications stakeholders.
- Identify main immediate priorities: Priorities may be user flexibility, data security, cost savings, IT efficiency, availability, etc.
- Develop holistic VDI roadmap: Engage application, data center, network, and security stakeholders. Develop roadmap to support data center short- and long-term goals and initiatives.
- Engage with Cisco and partners: Plan, design, deploy, implement, operate, and optimize.

For more information, visit <http://www.cisco.com/go/vdi>.