Virtual desktop acquisition cost analysis

CITRIX®

citrix.com

App and desktop virtualization is much more than a technology solution. It is transforming the way organizations of all sizes are enabling their workforces while simplifying the desktop management process for IT administrators. With app and desktop virtualization, IT organizations can provide every user with a workspace environment completely unrestricted by physical location. This solution also addresses many common business challenges facing IT organizations, such as enabling mobile workstyles without compromising security, increasing the speed of integration and standardization required for mergers and acquisitions, streamlining desktop management efforts as the number of employees in remote offices and offshore locations increases and making the user experience personal through self-service access to applications and desktops.

In many cases, the pure business benefits of app and desktop virtualization alone justify any acquisition costs, even before proving a long-term return on investment. Nonetheless, spite of these well-known security, management and flexibility benefits, the historic acquisition costs of desktop virtualization, also known as VDI, may give organizations pause as they contemplate a go-forward strategy.

VDI at scale has been perceived to be very expensive, primarily due to the assumption that a robust, high-performance shared storage infrastructure was required. After all, enterprises have been cycling through the age-old physical PC refresh process for years and simply replacing older PCs with new machines each year as their cost-effective desktop solution. Until recently, many enterprises were convinced that replacing physical PCs was less expensive that desktop virtualization, but today these perceptions of VDI as an expensive, niche solution are no longer true. The overall implementation costs of desktop virtualization solutions are declining as designs, features and optimizations improve.

Within the virtual app and VDI space, Citrix XenDesktop with FlexCast technology is one of the most cost-effective solutions, and it is ideal for enterprises looking to conserve budget associated with purchasing new physical PCs each year. XenDesktop, the market leader in app and desktop virtualization, is the best solution

for transforming Windows apps and desktops into an on-demand service available to any user on any device, anywhere. It is recognized industry-wide as a proven solution that can reduce the costs associated with the PC refresh cycle. Citrix continues to differentiate XenDesktop from competitors based on its unique attributes, such as shared storage optimizations for centralized image management with full user personalization via Personal vDisk technology, Windows Server-based app and desktop virtualization, hardware virtualization with Citrix XenServer and secure remote access with mobility management using Citrix NetScaler Gateway.

This white paper investigates the acquisition costs of desktop virtualization and the infrastructure cost benefits associated with providing a XenDesktop with FlexCast technology solution. For illustration purposes, this white paper includes assumptions for environment design, resource configuration, user categorization and cost based on deployment and implementation recommendations and costs available to customers within the PC Refresh Savings Calculator. This analysis serves as a tangible reference for calculations and results that further demonstrate the cost benefits of XenDesktop with FlexCast technology.

Cost analysis

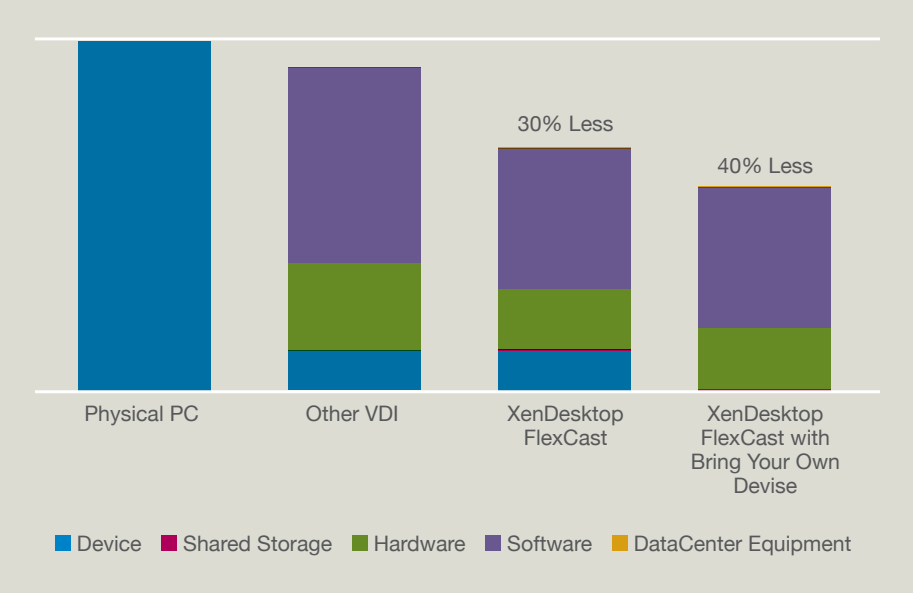

Figure 1: Desktop virtualization cost analysis

Figure 1 compares the costs associated with four different desktop virtualization solutions. Following are the supporting details for each model.

Physical PC costs: According to a 2013 Gartner report, "…$890 spread over four years for a current mainstream desktop configuration"[1] is the baseline PC cost against which virtual desktop acquisition costs were compared.

[1] Federica Troni, Michael A. Silver. Gartner Desktop Total Cost of Ownership: 2013 Update. March 2013.

Other (competitors') VDI costs: Total acquisition costs per user came in slightly less than those for PCs, at $820, further endorsing the economic feasibility of desktop virtualization. This amount was broken down into device ($100), server hardware ($221), software ($496) and additional datacenter equipment to support the new servers ($3).

XenDesktop with FlexCast: Total acquisition costs for XenDesktop with FlexCast technology based on the methodology and assumptions presented in this white paper are $100 for the device, $2 for shared storage, $154 for server hardware, $362 for software and $3 for additional datacenter equipment to support the new servers.

XenDesktop with Bring Your Own Device: Many organizations are allowing employees to bring in their own personal devices, completely removing any physical endpoint costs for the enterprise. This solution's costs are broken down into $2 for shared storage, $154 for server hardware, $362 for software and $3 for additional datacenter equipment to support the new servers.

Cost of acquisition for XenDesktop

Various fiscal methods can be used for evaluating the investments and operational efficiencies associated with app and desktop virtualization provided by XenDesktop. Citrix offers a variety of tools, including a self-service, online PC Refresh Savings Calculator that compares traditional PC refresh strategies with innovative app and desktop virtualization. However, many CIOs and executives are seeking guidance regarding the capital investment costs. Therefore, this white paper focuses strictly on the total acquisition costs associated with XenDesktop. The costs included in the analysis are restricted to the following capital expenses:

- Physical servers used to host virtual apps and desktops with supporting infrastructure components
- Shared storage used to provision and personalize select virtual desktops
- Software that enables virtualization, provisioning, user connection and data collection associated with a virtual app and desktop deployment
- User devices, both personal and corporate issued, used to access virtual apps and desktops
- Network equipment associated with secure, remote access, as well as the additional servers required
- Datacenter equipment associated with the increase in physical footprint

FlexCast cost methodology

XenDesktop with FlexCast technology enables enterprise IT to deliver Windows as a service from a single infrastructure to users in a variety of work scenarios. XenDesktop is a user-centric solution that can be adjusted based on employee needs, making it ideal for large enterprises that have a variety of employees, apps,

desktops and workloads. This analysis evaluates the baseline capital expenditure for an enterprise with 2,500 concurrent users accessing XenDesktop virtual apps and desktops using different FlexCast use cases.

User segmentation: The 2,500-user workforce was broken down into more-granular groups. The first categorization step was to segment users: 75 percent of the users were assumed to be task-oriented workers, 20 percent to be knowledge workers and 5 percent to be power users. Once the high-level user types were identified, the workload for each type was assessed. User workload depends upon both the type and number of applications utilized throughout the workday and is categorized into light, normal and heavy workloads. There is a direct correlation between the type of user workload and the computing resources associated with the virtual desktop.

- **Task-oriented workers:** It was assumed that providing access to a limited number of apps hosted on a standard Windows desktop would address all of the business and computing resource needs for this user group.
- **Knowledge workers:** Knowledge worker and power user requirements are closely related: both groups require dedicated computing resources, unlike the task-oriented workers. However, it was assumed that knowledge workers have a normal workload with access to personalize some aspects of their Windows desktop, such as set favorites and customize look and feel.
- **Power users:** Power users were assumed to have a heavy workload and require the ability to fully personalize their desktop, including the ability to install unique applications.

FlexCast use cases: The next step in designing the solution was to determine the appropriate XenDesktop delivery use case for the individual user groups. Personalization, or the ability to make modifications to the virtual desktop that would persist between uses beyond what is currently available in a user profile solution, was a key decision point when evaluating XenDesktop desktop delivery methods. Although XenDesktop offers a range of virtual desktop and app delivery methods, only the following were evaluated in this scenario:

Virtual desktop use cases:

- **Server-based Desktops:** From any device, users remotely access virtual desktops from a Windows server secured in the datacenter. Each desktop instance is isolated from those of other users accessing the same server, with personalized app and desktop settings stored in a user profile.
- **Pooled VDI:** From any device, users remotely access virtual desktops hosted on a hypervisor secured in the datacenter. A single virtual desktop image with a desktop operating system is rapidly provisioned to each user. Only user-specific app and desktop settings stored in a user profile persist between virtual desktop reboots.

- **Personal VDI:** From any device, users remotely access virtual desktops hosted on a hypervisor secured in the datacenter. A single virtual desktop image with a desktop operating system is rapidly provisioned to each user. All user-specific app and desktop settings are stored in a personalized storage layer, enabling personalization to persist between reboots.

Virtual app use case:

- **Server-based Apps:** From any device, users remotely access virtual apps from a Windows server secured in the datacenter. Each user can remotely access an isolated instance of the app running on a single server located in the datacenter and optimized for access from mobile devices.

Task-oriented workers are typically able to work within a standard desktop image without the need for personalization beyond that provided through a profile. For this reason, it is assumed that task-oriented workers are best suited for a Windows server-based virtual desktop. The other 25 percent of the workforce, the remaining 625 knowledge and power users, needed dedicated computing resources; this FlexCast use case is referenced as Pooled VDI. Other desktop virtualization solutions require a more costly, dedicated virtual desktop for user personalization, but XenDesktop offers Personal vDisk technology, known as Personal VDI, which allows organizations to utilize a central, pooled desktop image for all users with a unique Personal vDisk layer for user personalization and customizations.

The following table summarizes the complete user and workload categorization:

User category	Workload	User count	FlexCast use case
Task-oriented worker	Normal	1875	Server-based Desktops
Knowledge user	Normal	500	Pooled VDI
Power user	Heavy	125	Personal VDI

Table 1: FlexCast use case selected for each user grouping

All workers will have access to their virtual desktops from mobile devices, but the enterprise also identified a select number of critical business apps that should be optimized for mobile device access. XenDesktop HDX Mobile technology provides mobile optimization policies that intelligently touch-enable Windows-based application controls, such as drop-down boxes and pop-up keyboards, to make Windows apps more usable on mobile devices, including tablets and smartphones.

The following table summarizes the mobile, virtual app requirements categorization:

User category	Number of virtualized applications	Number of Mobile Users	FlexCast use case
All users	5	500	Server-based Apps

Table 2: FlexCast use case for virtual apps

Requirements process: Once the assumptions and user groupings were established, Citrix identified the standard design assumptions to determine the core sizing and requirements for each user group within its respective FlexCast use case and the supporting infrastructure across the entire deployment. Each subset of the FlexCast use cases was evaluated independently, with a different set of computing resources associated with each type of user workload. This grouping allowed Citrix to determine a list of requirements for each individual FlexCast use case and a collective list of computing requirements for the overlying infrastructure and remote access components. The overall analysis was broken down into the following individual modules:

Module	Description
Pooled VDI	Resources required to support XenDesktop virtual desktops virtualized on XenServer, streamed with Provisioning Services and personalized with Personal vDisk for power users.
Server-based Desktops	Resources required to support Windows Server-hosted virtual desktops, where virtual Windows Servers utilize Microsoft Remote Desktop Shared Hosted (RDSH) technology, are hosted on XenServer and streamed with Provisioning Services
Server-based Apps (Mobile)	Resources required to support Windows Server-hosted virtual apps, where apps are installed on virtual Windows Servers, utilize Microsoft Remote Desktop Shared Hosted (RDSH) technology, are hosted on XenServer and streamed with Provisioning Services
Infrastructure Module	Resources required to support the overlying XenDesktop infrastructure including XenDesktop Controllers, Citrix Studio, Citrix License Server, StoreFront, Microsoft SQL Server, Provisioning Services and Citrix Director servers
Remote Access Module	Resources required to support remote access through Citrix NetScaler Gateway

Table 3: XenDesktop module definition

Design assumptions

When identifying the computing needs for each XenDesktop architecture module, some key XenDesktop design decisions were required to help finalize the sizing and resourcing requirements. These design decisions adhered to Citrix implementation best practices.

Citrix XenServer was selected as the hypervisor of choice for the configuration, given that it is included in every edition of XenDesktop. For this analysis, the

IntelliCache feature of XenServer was not included in an effort to make the model transferable to other hypervisors through differential hypervisor cost adjustments.

The Pooled VDI configuration was based on a Windows 8.1 desktop with a 30GB operating system drive streamed by Citrix Provisioning Services in orchestration with XenDesktop Personal vDisk for Personal VDI. The 5GB Provisioning Services write cache for each Pooled VDI desktop was located on local storage using solid state drives in a client-side configuration. The Personal VDI configuration utilized the same 5GB for the Provisioning Services write cache plus an additional 10GB for the Personal vDisk, the 15GB was allocated on shared storage to protect personalized settings in the event of a failure. A Microsoft Virtual Desktop Access (VDA) license was required for the Pooled VDI and Personal VDI desktops.

The Server-based Desktops and Server-based Apps (mobile) configuration utilized a Windows Server 2012 virtual machine. The Windows Server image was assumed to be 50GB in size and streamed with Provisioning Services. The Provisioning Services write cache was 10GB and located on a local RAID 10 storage in a client-side configuration. A Microsoft Remote Desktop Services Client Access License (RDS CAL) was required for each Server-based desktop connection.

All existing infrastructure required for a standard PC workplace environment, such as Microsoft Active Directory, file servers for profile solutions and DNS/DHCP servers, was assumed to remain the same in the virtual app and desktop environment. The Citrix profile management solution was used to optimize profile performance.

Scalability numbers vary across different server hardware configurations for desktop virtualization, but in most cases IT administrators order from a limited number of standard physical server configurations to reduce variation in the datacenter. To align with this procurement process, Citrix selected only two physical server configurations for this model. The physical rack mount servers hosting the virtual desktop infrastructure (VDI) were standardized with 256GB RAM, 16 logical processor cores, eight 100GB SSD drives and four NICs for the provisioning, desktop, management and storage networks. The physical rack mount servers hosting the server-based apps and desktops were standardized with 256GB RAM, 16 logical processor cores, eight 15K SAS drives and four NICs for the provisioning, desktop, management and storage networks.

Some redundancy was factored into the overall cost as a way to ensure that desktops and infrastructure components could be moved between hosts for physical server and hypervisor maintenance. Redundancy was calculated at N+1 to ensure that limited physical resources were always available, but it should be noted that the redundancy factor is not intended as a high-availability or disaster recovery solution.

With a work anywhere app and desktop virtualization solution such as XenDesktop, remote access is a key component. Citrix therefore incorporated remote access into the analysis for all 2,500 users. Given the size of the workforce, a pair of physical Citrix NetScaler appliances with NetScaler Gateway were selected to provide remote access. A single physical NetScaler appliance could support the 2,500-user model, but a second device was added for fault tolerance.

Cost assumptions

Each of the following cost assumptions is based on the standard list price to eliminate any volume discount bias and make the analysis simple to compare against other solutions. By taking this approach, the final costs are typically higher than those actually paid by businesses due to variables such as size of workforce, number of locations and existing IT investments.

VDI servers: The physical servers allocated for the Pooled VDI and Personal VDI desktop modules had 256GB RAM,16 logical processor cores and eight 100GB SSD drives for maximum desktop density with optimal performance. A price point of $13,655 was identified for a 2u rack-mount server with two 8-core Intel Xeon E5-2670 processors (2.6 GHz) with 4x32GB quad rank memory per processor and eight 100GB SSD hard drives. Each physical server utilized XenServer as the hypervisor for the virtualized desktops. Citrix ensured that the number of Pooled VDI desktops per server would not exceed 150.

Server-based Apps and Desktops/XenDesktop infrastructure servers: The physical servers allocated for the Server-based Apps and Desktops/XenDesktop infrastructure modules (control and imaging models) had 256GB RAM and 16 cores. A price point of $11,163 was identified for a 2u rack-mount server with two 8-core Intel Xeon E5-2670 processors (2.60 GHz) with 4x32GB dual rank memory per processor and eight 300GB 15K RPM SAS hard drives. Each physical server utilized XenServer as the hypervisor for the virtualized infrastructure servers and Server-based Apps and Desktops. Citrix ensured that the number of concurrent Server-based app and desktop users per physical server would not exceed 200.

Client devices: The analysis examined device costs using two different approaches. The first approach was a bring-your-own (BYO) use case; in this case the client device cost was estimated to be minimal or zero since the user's personal device was leveraged. The standard FlexCast use case assumed a thin client with system-on-a-chip (SoC) technology; the cost for this thin-client device was calculated to be $100 without keyboard, mouse or monitor.

XenDesktop licensing: XenDesktop is available in App, VDI, Enterprise and Platinum Editions, with the latter including the most comprehensive feature set for desktop and app virtualization. For this analysis, Citrix selected XenDesktop Enterprise to ensure that both VDI and Server-based apps and desktops use cases could be provided. While XenDesktop Enterprise edition is the less-expensive choice, XenDesktop Platinum should be considered when evaluating complete capital and operational savings since XenDesktop Platinum includes key features such as EdgeSight, AppDNA, SmartAccess and more.

Citrix appliances: A pair of physical NetScaler appliances with NetScaler Gateway were identified during the design process as the optimal solution for remote access, so the analysis includes a pair of NetScaler MPX 5500 appliances with a price point of $9,000 each.

Pooled VDI desktops licensing (Microsoft[2]): The Windows 8.1 Professional operating system was selected for the Pooled VDI and Personal VDI desktops. A

Microsoft Virtual Desktop Access (VDA) license is required for each Pooled VDI desktop instance when accessing the virtual desktop via a BYO endpoint or thin client. A price point of $100 per desktop was assumed for the Microsoft VDA license.

Server-based apps and desktops licensing (Microsoft[3]): Each Windows server providing virtual apps and desktops requires a Windows Server 2012 license and a Remote Desktop Services Client Access License (RDS-CAL) to ensure that the solution is properly licensed for each user. It was assumed that the Windows Server 2012 Datacenter edition license would cost $8,451. XenDesktop requires an RDS-CAL for each server-based virtual app and desktop connection; a cost of $100/user was identified for each RDS-CAL required for the 1,875 users accessing a Server-based desktop. It should be noted that the RDS-CAL is a perpetual license that only needs to be purchased once, whereas the VDA license is a subscription-based license and needs to be paid for each year.

Infrastructure licensing (Microsoft[4]): The physical servers hosting the XenDesktop infrastructure virtual servers ran Windows Server 2012 Datacenter Edition with a cost of $8,451. Microsoft SQL Server is the only other component with an individual associated Microsoft cost. Microsoft SQL Server Standard Edition 2012 single OPEN license was priced at $898, with a yearly software assurance cost of $449.

Storage: When determining the price point for storage, it was difficult to lock down a specific price per gigabyte, given that input/output operations per second (IOPS) rather than storage capacity is typically the most restrictive factor in a virtual desktop design. The demand for IOPS is most prevalent within the Provisioning Services write cache. It can be addressed through various storage optimization techniques based on proprietary solutions from a particular storage vendor, leveraging SSD hard drives or increasing the number of spindles by increasing the number of available SAS or SATA drives. Opinions on this topic differ, but for the purpose of this analysis, SSD hard drives within the local physical servers were selected for the VDI servers. This ensured that that there was adequate capacity: 150 Pooled VDI desktops require 750GB of the 800GB leaving room for the hypervisor. The higher-performance SSD hard drives adequately cover the required IOPS. The cost for the SSD hard drives is collectively addressed in the physical desktop server costs previously noted.

Local storage is able to address some storage needs, but shared storage is still required when desktop failover or preservation of settings stored in the Personal vDisk is required. This analysis assumes that shared storage is required for Personal VDI servers. Some storage vendors have established a flat shared storage price point as low as $35 per XenDesktop with Personal vDisk instance,[5] so this is the price point used in this analysis. However, the online XenDesktop savings calculator can be leveraged to provide a more granular analysis based on shared storage IOPS and usable capacity.

[2] A Microsoft representative should be contacted for specific Microsoft license and pricing information. This paper provides no guidance on Microsoft licensing, the numbers represented in this paper were obtained from mla.microsoft.com.

[3] A Microsoft representative should be contacted for specific Microsoft license and pricing information. This paper provides no guidance on Microsoft licensing, the numbers represented in this paper were obtained from mla.microsoft.com.

[4] A Microsoft representative should be contacted for specific Microsoft license and pricing information. This paper provides no guidance on Microsoft licensing, the numbers represented in this paper were obtained from mla.microsoft.com.

[5] https://communities.netapp.com/community/netapp-blogs/cloud/blog/2013/05/21/desktop-virtualization-netapp-citrix-continuing-to-lower-the-storage-cost-per-desktop-by-abhinav-joshi-sr-product-manager-desktop-virtualization-netapp

Datacenter infrastructure: There are incremental datacenter infrastructure costs associated with adding a solution of this size. The following price points were selected for datacenter components:

- **Network switches:** Additional network switches were allocated to the architecture to support the desktop/provisioning, storage and management networks. Each switch was priced at $14,000 and included forty-eight 10/100/1000 PoE ports and two X2-based 10 gigabit Ethernet ports.
- **Rack:** All the storage, servers and appliances required a new storage location, so a price of $1,098 was allocated for a single, 42-unit rack.
- **Power strips:** Additional power strips were also required for the new equipment; each metered power distribution unit (PDU) was priced at $549 with 42 connectors.

Requirements

Each of the aforementioned price points was utilized to establish the overall total acquisition costs for each of the 2,500 user XenDesktop with FlexCast use cases.

Module	Requirements
VDI (Pooled and Personal)	Pooled VDI desktop (normal workload): • Desktop image size: 30 GB • Desktop vCPU: 2 (6 users per core) • Desktop RAM: 2 GB
	Personal VDI desktop (heavy workload): • Desktop image size: 30 GB • Desktop vCPU: 2 (4 users per core) • Desktop RAM: 4 GB
	Total VDI desktop requirements • CPU: 116 cores • RAM: 1500 GB XenServer hypervisors: 9 Total XenServer hypervisors: 10 (N+1)

Server-based Apps and Desktops	Windows Server 2012 • Desktop image size: 50 GB • Desktop vCPU: 2 • Desktop RAM: 16 GB
	Total VDI Desktop Requirements • CPU: 159 cores • RAM: 1280 GB XenServer hypervisors: 11 Total XenServer hypervisors: 12 (N+1)
Infrastructure module (control and imaging modules)	Total virtual machines: 13 Total CPU cores: 50 Total RAM (GB): 164 Total storage for VMs (GB): 651 XenServer hypervisors: 4 Total XenServer hypervisors: 5 (N+1)
	VM breakdown: Citrix License Servers: 1 Citrix StoreFront servers: 2 SQL Servers: 3 Citrix Provisioning Services servers: 3 Citrix XenDesktop Controllers : 2 Citrix Director servers : 2
Remote access	NetScaler MDX appliance with NetScaler Gateway (physical): 2

Cost

The cost analysis was broken down into different phases; the individual hardware and software licensing costs were accumulated based on each individual desktop module. The datacenter, remote access and shared storage costs were evaluated on a collective basis.

Hardware and software licensing costs

The following reflects the physical hardware costs and license costs associated with XenDesktop Platinum, SQL Server and Microsoft RDS-CAL and VDA licensing.

Module	Requirements	Costs	Total costs
VDI (Pooled and Personal)	Hypervisors: 10	$13,655 (server)	$136,550
	VMs: 625	$100 (Microsoft VDA)	$62,500
	Users: 625	$225 (XenDesktop Enterprise)	$140,625
	XenDesktop licenses: 625	$35 (XenDesktop Enterprise SA)	$21,875
		$15 (XenDesktop Premier Support for Enterprise)	$9,375
			$370,925
Server-based Apps and Desktops	Hypervisors: 12	$11,163 (server)	$133,956
	VMs: 80	$100 (Microsoft RDS-CALC)	$8,000
	XenDesktop licenses: 1875	$225 (XenDesktop Enterprise)	$421,875
		$35 (XenDesktop SA)	$65,625
		$15 (XenDesktop Premier Support)	$28,125
	Microsoft server licenses: 12	$8,451 (Windows Server 2012 Datacenter Edition)	$101,412
			$758,993
Infrastructure module (control and imaging modules)	Hypervisors: 5	$11,163 (server)	$55,815
	SQL Server VMs: 3	$898 (SQL Server) $449 (SQL Server SA)	$4,041
	Microsoft server licenses: 5	$8,451 (Windows Server 2012 Datacenter Edition)	$42,255
			$102,111

Storage costs

The following reflects the shared storage, required only for the Personal VDI desktops to ensure redundancy for the personalized settings.

Module	Requirements		
Storage module	Personal VDI desktops: Personal VDI desktops: 125 Personal VDI Shared Storage Provisioning Services Write Cache: 5 GB Personal vDisk: 10GB Cost per Personal VDI: $35		
	Personal VDI: 125	Storage Cost per Personal VDI: $35	$4375

Remote access and datacenter costs

The following costs reflect the NetScaler appliance and datacenter equipment required for the new infrastructure.

Module	Requirements	Costs	Total costs
Remote access module	NetScaler appliances: 2 (with NetScaler Gateway)	$9,000	$18,000
Datacenter costs	Network switches: 3	$14,000	$42,000
	Racks: 2	$1,098	$2,196
	PDUs: 6	$549	$3,294
			$752,841

Conclusion

App and desktop virtualization has been criticized in the past for being more costly than a traditional PC deployment because admins assume it requires expensive virtual infrastructure. Citrix XenDesktop with FlexCast technology is the key differentiator for desktop and app virtualization. XenDesktop provides the right type of virtual desktop for each type of user, such as a server-based desktop for a task-oriented worker versus a fully personalized desktop for a power user. FlexCast balances the high user density of server-based virtual apps and desktops with the centralization, personalization and storage optimizations of Personal VDI by enabling desktop virtualization for the entire workforce and distributing cost evenly.

This paper addressed many of the hard acquisition costs associated with deploying XenDesktop desktop virtualization, but there are many other operational cost advantages of app and desktop virtualization. These include the ability to streamline desktop management, introduce flexible workspaces to reduce real estate costs and simplify the employee onboarding process to accelerate productivity. Cost-effectiveness is only one of the reasons why an organization should evaluate desktop virtualization with XenDesktop. With a current cost lower than typical enterprise PC deployments, desktop virtualization with XenDesktop and FlexCast will ensure that your organization has the right solution in place to retain employees, adapt to a global workforce and stay ahead of your competition.

Top Use Cases for Desktop Virtualization
http://www.citrix.com/solutions/desktop-virtualization/special-offers.html

Rethink the Traditional PC Refresh Strategy
http://www.citrix.com/content/dam/citrix/en_us/documents/products-solutions/rethink-the-traditional-pc-refresh-strategy.pdf

Citrix XenDesktop
http://www.citrix.com/products/xendesktop/overview.html

Corporate Headquarters
Fort Lauderdale, FL, USA

India Development Center
Bangalore, India

Latin America Headquarters
Coral Gables, FL, USA

Silicon Valley Headquarters
Santa Clara, CA, USA

Online Division Headquarters
Santa Barbara, CA, USA

UK Development Center
Chalfont, United Kingdom

EMEA Headquarters
Schaffhausen, Switzerland

Pacific Headquarters
Hong Kong, China

About Citrix
Citrix (NASDAQ:CTXS) is the cloud company that enables mobile workstyles—empowering people to work and collaborate from anywhere, easily and securely. With market-leading solutions for mobility, desktop virtualization, cloud networking, cloud platforms, collaboration and data sharing, Citrix helps organizations achieve the speed and agility necessary to succeed in a mobile and dynamic world. Citrix products are in use at more than 260,000 organizations and by over 100 million users globally. Annual revenue in 2012 was $2.59 billion. Learn more at www.citrix.com.