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Desktop Transformation Model: From Wow to How

Entering the World of Virtualization for Government, Education and Healthcare
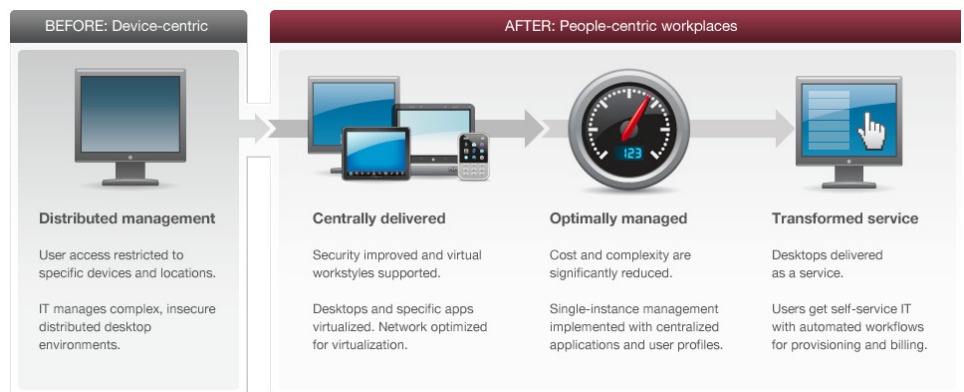
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Overview

The benefits of migrating to desktop virtualization are self-evident, making the decision to transition over a clear one. But for larger organizations within government, education and healthcare, the actual move from "wow" to "how"—that is, from decision to implementation—can be daunting in the details. IT managers need to lay out a pathway that matches business goals with the best technological resources, while still keeping in mind deployment options, costs, risk assessment and vendor choices.

Citrix Systems, Inc. understands the complexities associated with the switch to virtualization, and created the Desktop Transformation Model to provide practical guidance and simplify the virtual desktop adoption process for such groups. Citrix applies its proven methodology to help IT move from a traditional, distributed physical desktop system into a centrally delivered desktop environment.

The Desktop Transformation Model

Citrix created its novel Desktop Transformation Model to facilitate the transition of traditional enterprise desktop computing to a user-centric, on-demand service. It is the first industry-endorsed, repeatable method for transforming desktop computing from today's device-centric, distributed management paradigm to a more user-focused and virtualized model. This unique model combines the collective experience of thousands of customers and partners across every industry segment who have successfully rolled out millions of virtual desktops and applications to their end users.

While the specifics of each government, education or healthcare organization's plan may vary, there are still common technical approaches to achieving enterprise-wide desktop transformation. These approaches can be categorized into four unique desktop computing architectures, as shown in the following high-level overview:

BEFORE: Device-centric	AFTER: People-centric workplaces		
Distributed management	**Centrally delivered**	**Optimally managed**	**Transformed service**
User access restricted to specific devices and locations.	Security improved and virtual workstyles supported.	Cost and complexity are significantly reduced.	Desktops delivered as a service.
IT manages complex, insecure distributed desktop environments.	Desktops and specific apps virtualized. Network optimized for virtualization.	Single-instance management implemented with centralized applications and user profiles.	Users get self-service IT with automated workflows for provisioning and billing.

Who can benefit from the Desktop Transformation Model?

In essence, the larger the organization—be it federal agency, higher education institution or healthcare group—the more far-reaching the benefits in terms of operating efficiencies and cost savings. Those that should consider using the Citrix Desktop Transformation Model include:

- Federal government agencies, departments and institutions
- State and local government entities
- Primary and secondary (K-12) schools
- Colleges and universities
- Regional healthcare systems
- Hospitals and clinics
- Medical center campuses
- Aged care facilities

With the move to virtualized computing, organizations instantly become better equipped to address initiatives for telework programs, green IT, cost-cutting, consolidation, improving overall security and more. Citrix cloud solutions make it possible for users to work securely and productively, from any location, over any connection and on any device.

The Three Steps to Transformation

The Citrix Desktop Transformation Model provides actionable steps that IT leaders and architects can take to ensure that they are well prepared to address IT and business priorities by transforming traditional desktops into optimally managed, transformed desktop computing resources. However, before government, education and healthcare groups delve into the technical details associated with implementation, they must carry out the following key exercises:

1. Establish Business Priorities. The best way to leverage desktop virtualization is to first identify and prioritize immediate and future business requirements, including business agility, security concerns, virtual work styles and cost reduction. Organizations must also account for end-user and IT attitudes toward change, new technologies and new approaches to computing. Identify which users map to the top priorities, helping to determine which groups can immediately drive the most benefit to the organization.

2. Assess the Time to Value. Once an organization establishes its priorities, it must map out how quickly the business priorities can be addressed. Establishing the time to value of desktop virtualization begins at user segmentation and then assesses the complexities of implementing the right technology for each user group. To gain a quick and visible win, organizations should start with high-impact user groups that promise a relatively short time to value. Once an initial project has been implemented, adding additional users with similar requirements becomes faster, simpler and more reliable.

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3. Establish a Technology Roadmap. Following completion of the first two steps, IT leaders can start prioritizing and planning individual projects— which will in turn help determine which virtual desktop technology and other technologies are best suited to deliver maximum value to each user group. This should bring IT closer to defining the roadmap for gradually transforming the entire enterprise. It's critical that IT staff spend time on project planning to set realistic goals, adhere to milestones and avoid missing important project dependencies.

Establish Business Priorities

IT leaders must get clarity on their overall strategic imperatives to force-rank all possible virtualization initiatives. Organizations should map out business priorities driving the desktop transformation: reducing costs, increasing security, enabling virtual work styles, increasing business agility and achieving greater device independence. It is important that this exercise is done jointly with IT decision makers and the representatives of the various business units within a government agency, school system or healthcare network.

Assess the Time to Value

When selecting potential projects to meet the business priorities, leaders must consider the time to value of each project. A multitude of factors affect how quickly a potential benefit can be realized. They include the following two steps:

> User Segmentation. Clearly identify user needs and establish common requirements that can drive common technical solutions.

> Identifying Desktop Transformation Model Architectures. IT architects can design a variety of different virtual desktop models. Each model is characterized by varying degrees of complexity in its implementation, varying changes in IT business practices and is associated with varying levels of capital and operational expenses. Picking the right desktop delivery model that meets the user's business needs is critical to the long-term success of the project and user satisfaction.

User Segmentation

In high-level discussions, users are often classified as "task workers," "branch office workers," "mobile workers" and the like. For IT decision makers, this classification is too broad to offer meaningful segmentation. Many real users can simultaneously be described as task workers, mobile workers, and branch office workers, so a better definition is required:

"User Segmentation" is the activity that classifies IT users along common requirements that lead to common technical solutions. That way, the proper infrastructure can be built out in manageable IT projects that minimize risk and maximize the chance for project success.

User Segmentation Dimensions

To capture the right user attributes that allow technical IT staff to execute a well-defined virtualization project, decision makers must take technical requirements into account. The significant dimensions in many proven virtualization projects are:

1. Required application set
2. User locations
3. Mobility requirements
4. Physical endpoint requirements

Required Application Set

Capturing all applications is critical since applications are what users need to perform their jobs. While the analysis of most of these dimensions is a straightforward exercise, enumerating the required applications is a tougher step to perform. In many organizations, the corporate IT department does not actively manage all of the departmental applications. Many users are allowed to install their own applications onto their end point, often as a result of IT not having the resources or too-high lead times to support requested applications.

The simplest way to enumerate a department's applications is to administer a survey where department managers name the apps that their users require to perform their jobs. In large organizations, even that exercise can be cumbersome. Several Citrix Technology partners including Liquidware Labs, Lanamark, Novell, Matrix 42, RES and others offer tools and processes that gather data directly on user end-points or over the network, and report any running application back to a central database. Should the project involve a change in operating system (rolling out Windows 7 or leveraging Windows Server 200x), application compatibility assessments can become an important step. App-DNA and other partners offer software solutions to accelerate this process.

IT may find itself in the situation of having to oversee previously unmanaged applications. In the simplest case, existing application management tools such as Active Directory or Microsoft System Center can be used to deploy application packages into virtual desktops; Citrix XenApp™ and Microsoft App-V may be used to virtualize applications. Note that the specific application delivery mechanism is not important at this time—it is only critical to capture all applications required for users to perform their jobs.

User Locations

A user's primary location is used as a distinguishing attribute as well. While the infrastructure required in a datacenter may be entirely independent of the end user's location (a feat that is a major benefit of desktop virtualization in the first place), IT leaders may find that network connections, the need for remote access and WAN optimization solutions, and location-specific infrastructure can be significantly different from location to location. Therefore, IT leaders who seek to minimize project complexity may wish to treat otherwise identical users groups differently based on their primary location.

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Mobility Requirements

While two different sets of users may have similar job titles and both work from their home offices, their mobility requirements may be different, which can increase the complexity of any desktop virtualization project. Offline use cases and a distinction of mobile access scenarios, such as access from a government branch office as opposed to a hotel or airport lobby, can drive different technical requirements.

Physical Endpoint Requirements

A wide variety of end points can be leveraged in desktop virtualization. In most cases, delivering virtual desktops with XenDesktop™ is as easy as providing the proper Citrix Receiver™ for the end-point platform. However, if IT plans on replacing traditional PCs with thin clients to reduce cost and complexity on the users' desks, the specification of the end point may need to meet minimum requirements, for example to be used with HDX (High Definition User eXperience) video re-direction modalities.

Establish a Technology Roadmap

In order to establish a technology and project roadmap IT leaders must consider the two previously discussed dimensions:

Business Impact

First, the business impact of the desktop virtualization for each user group must be considered. The desktop virtualizations of high-business-impact users map best to the business dimensions identified in the Business Priorities exercise introduced above. It is not necessarily the users who provide the most value to the organization's core business, but those with a specific need or use case that is difficult to address with today's desktop computing environments.

Time to Value

Second, the time to value of each project must be evaluated. IT leaders are encouraged to think about the time needed for the technical implementation of the infrastructure, the amount of testing required (which can increase significantly for business critical user groups), and the conceptual changes on the organizational chart that such a project brings with it.

To minimize initial apprehension about desktop virtualization, Citrix recommends that IT leaders in government, education and healthcare do not introduce too many changes into the existing IT processes at once. If an organization has only limited experience with desktop virtualization, it's better to tackle the central delivery of desktops first, and then build out the capability for optimal management at a later point.

After an initial user group is successfully reached, IT organizations can expand their desktop virtualization capabilities and offerings based on business priorities. Once a particular technology has been implemented, additional user groups can be added to the environments by simply adding capacity and performing the actual user transition activities. Implementation and support get easier as organizations build out their competencies in the different desktop virtualization modalities, and costs per user are often reduced as more users are added to the existing infrastructure.

Planning the Project Implementation

As is the case with any major business transformation process, IT leaders are advised to spend significant time on project planning at the outset. In particular, project managers can develop and execute Gantt charts that establish the individual milestones and project dependencies.

It is important that IT leaders enlist help from desktop virtualization professionals in order to stick to timelines and avoid potential implementation pitfalls. Citrix Consulting Services and various System Integrators such as Capgemini, Dell, Fujitsu, Hewlett-Packard, IBM and members of the Global Network of Citrix Partners have the technical expertise and project execution experience to lead the transformation.

The Citrix Methodology

The implementation of a typical desktop virtualization project follows a standard planning strategy; an example is the Citrix Consulting methodology, which is comprised of four core phases. The Citrix methodology has been utilized to deploy hundreds of enterprise-scale XenDesktop and XenApp infrastructures. It provides a standardized, repeatable way to implement virtual desktops in environments of all sizes while following a basic approach of **Analysis, Design, Build & Test** and **Rollout.**

A brief overview of each phase is detailed below:

Analysis. The first stages of the Desktop Transformation Model contain a process for selecting a user group based on business priorities, time to value, and the organization's technology roadmap. During the analysis phase, that select user group is evaluated in detail and information about its current desktop environment, infrastructure and community is analyzed.

Design. The Design phase will produce a plan for the physical and virtual architecture used to host the virtual desktop environment. This involves a detailed architecture design, a breakdown of the individual software components and the final determination for overall hardware requirements.

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Build & Test. The Build & Test phase includes the process of implementing the design through obtaining and implementing the physical hardware and network, installing and configuring the software components of the virtual desktop solution, and preparing the base virtual desktop image. Functional and unit testing is completed during this phase to validate environment functionality.

Rollout. The Rollout process consists of end-user testing through a pilot and full production rollout to all targeted users. This phase includes the go-live planning, support procedures and IT operations and end-user training. Time is also allotted during this phase to gather feedback and implement relevant changes.

Through the use of proven methodologies, tools and best practices, Citrix Consulting helps to ensure the successful implementation of Citrix technologies while tailoring its solutions and project approach to fit the individual needs of our clients. By leveraging real-world experience, Citrix Consulting plays an integral role in each of the four project phases.

Citrix Solutions for Public Sector

Each sector faces a unique set of IT challenges and initiatives. With this understanding in mind, Citrix offers a customized approach to desktop and application delivery for federal, state, and local government; K-12 and university-level education; and healthcare groups—but always with the same result: a simpler, secure, cost-effective IT environment that enables virtual workstyles for users and virtual datacenters for IT.

Government. Now more than ever, governments depend on the ability to share and act on vital information—across agencies, functions and borders. For these groups, centralized applications, data and desktops are an essential requirement to support multiple branch locations. Many agencies also need to communicate with other agencies, often across state and national boundaries, adding further challenges to delivering applications over costly wide area network (WAN) links. Content privacy and security are essential to ensure that confidential information is not compromised.

The power of virtualization lowers IT support and administration costs while providing a vital platform for mobility and teleworking programs under normal conditions or in a disaster situation. Best-practice technologies offered by Citrix for telework, workforce mobility and disaster recovery enable federal agencies to expand current initiatives with the least expense and staff resources, while giving employees simple, secure and reliable solutions for connecting to the information and tools they need while working remotely.

Citrix can help IT teams and their executives meet these challenges, to enable agencies to effectively respond to emergencies, recover from disasters, and deliver basic services; increase worker productivity and efficiency; improve taxpayer satisfaction; and keep the costs of IT infrastructure low. Governments worldwide rely on Citrix, including more than 200 U.S. federal agencies, agencies in 50 U.S. states, and agencies in the 10 largest counties in America, as well as major government agencies across the globe.

Education. The world of education is increasingly going online. From providing students with courses and study material to managing staff and internal resources, recruiting, and conducting classes, educational institutions are turning to the web to streamline processes and cut costs. More schools are implementing e-learning programs to expand the reach of their classrooms to students across town and around the globe, while students are registering for class, applying for financial aid and conducting other school business online instead of on paper. Web applications for human resources and employee management are being used to keep track of faculty and staff requirements.

This massive online movement brings about some demanding requirements, even beyond IT efficiency and cost reductions, such as very high demand on application servers for each few days when students register, absolute privacy of information, and a server infrastructure that can adapt as more services (for example, CPU-intensive e-learning programs) become available online.

A partnership with Citrix enables continuous learning and other important education activities for students, teachers, faculty and administrators, while allowing schools to operate more efficiently and manage resources more effectively. Today, Citrix is relied upon by more than 200,000 such organizations worldwide, including all of the "Big 10" universities and more than 200 primary and secondary schools in the U.S.

Healthcare. Although the needs to reduce costs and increase services are much like those found in other industries, the healthcare arena finds itself facing additional challenges—increasing legislative mandates, staffing shortages, the demand for better customer service and diminishing government reimbursements, for example.

Such an environment has spawned the need to modernize IT systems, and this is where Citrix comes in—to help healthcare organizations address challenges and streamline IT processes to increase security and overall patient confidentiality, improve customer service and lower total cost of IT operations. Citrix is used by a wide array of organizations across the globe, including the top five global healthcare organizations and the top 15 U.S. healthcare organizations.

Citrix can help healthcare organizations:

- Meet the challenge of clinical modernization, by enabling the healthcare organization to reduce the complexity and costs of EMR delivery.
- Meet the challenge of clinician mobility, and improve physician and nurse satisfaction, by providing application security for patient diagnostic and treatment information on any device, at any location, over any connection.
- Meet the challenge of stringent privacy and security, by ensuring confidentiality for applications and information while building a foundation to comply with regulatory requirements, such as HIPAA.

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How it works: Citrix Delivery Center™

Citrix Delivery Center provides IT with an end-to-end solution for entering the cloud that virtualizes servers, applications and desktops, centralizes them in the datacenter and broadcasts them to users over any network as an on-demand service. The suite simplifies management while providing secure and reliable application and data delivery.
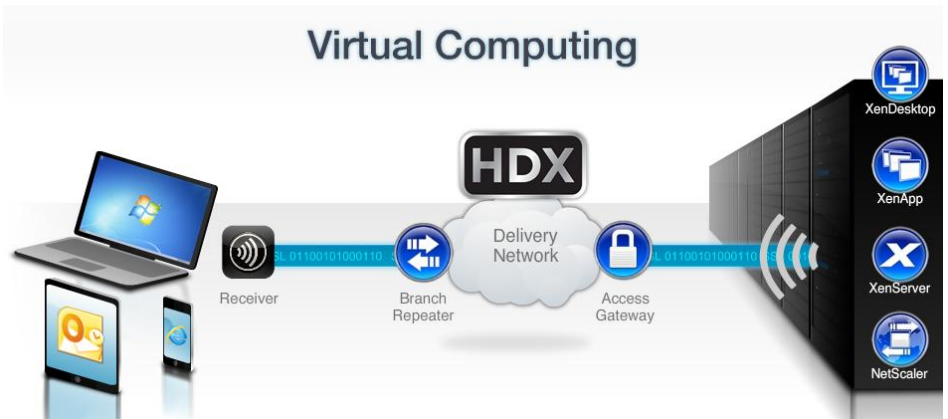
The Citrix Delivery Center suite features the following key elements:

Citrix® XenDesktop® is a desktop virtualization solution that delivers Windows desktops as an on-demand service to any user, anywhere. Whether users are task workers, knowledge workers or mobile workers, XenDesktop can quickly and securely deliver individual applications or complete desktops while providing a high-definition user experience.

Citrix® XenApp™ is an on-demand application delivery solution that enables any Windows application to be virtualized, centralized and managed in the datacenter, and instantly delivered as a service to users anywhere on any device. XenApp reduces the cost of application management by up to 50 percent, increases IT responsiveness when delivering an application to distributed users and improves application and data security.

Citrix® XenServer® is an enterprise-ready, cloud-proven virtualization platform with all the capabilities needed to create and manage a virtual infrastructure at half the cost of other solutions. The advanced XenServer capabilities enable organizations of any size to integrate and automate management processes to transform complex IT environments into virtual computing centers.

Citrix® NetScaler®, available as a network device or as a virtualized appliance, is a web application delivery appliance that accelerates internal and externally-facing Web applications up to five times, optimizes application availability through advanced L4-7 traffic management, increases security with an integrated application firewall, and substantially lowers costs by increasing web server efficiency.

Citrix® Access Gateway™ is a secure access solution that provides administrators with application control while empowering users with access from anywhere. With flexible deployment options and a single point of management, IT administrators set policies—based on roles, devices, and networks—to control access and user's actions, ensuring better security and compliance management.

Citrix® HDX™ technologies enable a high-definition user experience for virtual desktops and applications. HDX extends across the entire infrastructure. In the datacenter, HDX leverages the processing power and scalability of servers to deliver advanced graphic and multimedia performance, regardless of the capabilities of the endpoint device. On the network, HDX incorporates advanced optimization and acceleration capabilities to deliver a great user experience over any network, including for remote desktop access over high-latency, low-bandwidth environments. At the device, HDX leverages the computing capacity of endpoint devices to enhance user experience in the most efficient way possible.

Citrix® Branch Repeater™ is a branch optimization solution that provides a high-definition desktop and application experience to branch and mobile users while dramatically reducing bandwidth costs and simplifying branch infrastructure. Branch Repeater accelerates desktop and application delivery, decreases bandwidth consumption, and enables server consolidation.

Citrix® Receiver™ is a high performance, universal client technology that enables on-demand delivery of virtual desktops and Windows, web and SaaS applications to any user or device—including PCs, Macs, tablets and smartphones. With Citrix Receiver, IT has complete control over security, performance and user experience with no need to own or manage the physical device or its location.

Going From Wow to How: A Short yet Profound Leap

For government, education and healthcare enterprises, the transition from a physical to virtual desktop can be both easy and high-impact at the same time. By following the simplified Citrix approach to desktop virtualization, IT organizations can accurately assess the greater impact of the solution and begin their exploration into desktop virtualization. Through the process of identifying a group that is best situated for an assigned virtual desktop, organizations can easily begin the transition to a Hosted VDI model with minimal cost, minimal turnaround time and maximum impact. The migration from a distributed desktop is the first piece of the puzzle, and by taking a gradual approach to desktop virtualization the overall end goal of a completely transformed desktop as a service model will be much easier to attain.

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To learn more, please visit www.citrix.com/desktoptransformation

Citrix virtual computing solutions help the government build simpler and more cost-effective environments that deliver IT as a service and make it easy for users to work in the most optimal way.

Citrix® XenDesktop™ is a desktop virtualization solution that delivers Windows desktops as an on-demand service to any user, anywhere.

Citrix® XenApp™ is an on-demand application delivery solution that enables applications to be centralized and managed in the datacenter and instantly delivered as a service to users anywhere.

Citrix® XenServer™ is an enterprise-ready, cloud-proven virtualization platform with all the capabilities needed to create and manage a virtual infrastructure at half the cost of other solutions.

Citrix® NetScaler®, available as a network device or as a virtualized appliance, makes web applications run better by accelerating application performance, optimizing application availability, and enhancing web application security while substantially lowering costs.

Citrix® Access Gateway™ is a secure desktop and application access solution that provides administrators granular application-level control while empowering users with access from anywhere.

Citrix® Branch Repeater™ is a branch optimization solution that provides a high-definition desktop and application experience to branch and mobile users while dramatically reducing bandwidth costs and simplifying branch infrastructure.

Citrix Receiver™ is a high performance, universal client technology that enables on-demand delivery of virtual desktops, Windows, web and SaaS applications and IT services to any device.

Citrix Systems, Inc. (NASDAQ:CTXS) is a leading provider of virtual computing solutions that help companies deliver IT as an on-demand service. Founded in 1989, Citrix combines virtualization, networking, and cloud computing technologies into a full portfolio of products that enable virtual workstyles for users and virtual datacenters for IT. More than 230,000 organizations worldwide rely on Citrix to help them build simpler and more cost-effective IT environments. Citrix partners with over 10,000 companies in more than 100 countries. Annual revenue in 2010 was $1.87 billion.

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