Desktop Transformation Guide

Guidance for Moving to a Centrally Delivered Virtual Desktop Approach

Citrix Worldwide Consulting Solutions
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Introduction

When looking at desktop virtualization, it may be confusing to try to determine where to start when there are a variety of options and deployment scenarios. In an effort to help simplify the virtual desktop adoption process and provide IT organizations with a new vision for the future of enterprise desktop computing, Citrix has formed the Desktop Transformation Model. The model focuses on providing IT organizations with practical guidance for actually making that transition into a virtual desktop environment.

As part of this process, the Citrix Consulting Solutions team has applied their proven methodology to help guide an IT organization through the process of moving from a traditional, distributed physical desktop environment and into the very first phase of the Desktop Transformation Model known as centrally delivered. Centrally delivered desktops provide an IT organization with an easy, simple method for pursuing a virtual desktop solution and set the stage to pursue the other later phases of the Desktop Transformation Model.

The goal of this paper is to provide practical guidance to help an IT organization make the migration from a traditional, distributed desktop environment and into a centrally delivered desktop environment through the application of the Citrix Consulting methodology.

The Desktop Transformational Model

Citrix created the Desktop Transformation Model to illustrate the transition of enterprise desktop computing from the traditional desktop computing model into a completely transformed user-centric, on-demand service model. The following figure provides a high-level overview of the model, for a complete overview please visit www.citrix.com/desktoptransformationmodel.

![Citrix Desktop Transformation Model](image-url)

Figure 1: Citrix Desktop Transformation Model
Consulting Methodology

The Citrix Consulting methodology has been utilized to deploy hundreds of large-scale XenApp and XenDesktop deployments. This methodology provides a standardized, repeatable way to implement virtual desktops in environments of all sizes.

It follows a basic pattern of Analysis, Design, Build & Test and Rollout. This paper explains the high-level actions an organization should take to move from a traditionally managed desktop environment into a centrally delivered desktop environment as it relates to the methodology. A brief overview of each phase is detailed below and to help portray the migration process in a real-world scenario, and Citrix Consulting has also embedded a case study example modeling previous engagement experience.

![Citrix Consulting Methodology Diagram](image)

**Figure 2: Citrix Consulting Methodology**

**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 associated with their current desktop environment, infrastructure, and community is analyzed.

**Design**

The design phase will produce a plan for the physical and virtual architecture that will be 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.
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.
Migration Guidance

The first transition within the Desktop Transformation Model is the migration from a traditional, distributed desktop management environment, which most organizations currently use as their mainstream desktop offering, into a centrally delivered desktop environment. A centrally delivered environment offers IT organizations the ability to enable virtual work environments while maintaining data security. When looking to make the transition, it is best to utilize the Citrix Consulting methodology to gather the necessary information required to identify success criteria, create a detailed design, and develop a project plan all targeted at providing a successful deployment, positive end-user experience and operational guidance for continued support after the environment is released into production.

For the purposes of this paper, the migration process in adherence with the Citrix Consulting methodology for the select user group as identified through the review of business priorities, time to value, and an organization’s technology roadmap as documented here. Within this paper the select user group is making the simplest transition from a traditional, distributed desktop environment into a Hosted VDI virtual desktop environment. In the Hosted VDI virtual desktop environment, each user will have an assigned, dedicated virtual desktop just as they currently have an assigned, dedicated physical desktop. Although, the centrally delivered migration offers other virtual workplace options such as a Hosted Shared desktop or centrally delivered virtual applications through XenApp, the Hosted VDI solution represented in this paper provides a simple, clean transition between a distributed desktop into a centrally delivered desktop that enables a secure, centralized virtual workplace without requiring a large scale desktop management process redesign.

In this section each phase of the Citrix Consulting methodology will be laid out in detail as it specifically relates to the migration into a Hosted VDI desktop environment. The specific tasks associated with each phase will be provided and then a use case example of a real-world customer will be added for context. The use case example will assess how Worldwide Co. utilized the Hosted VDI migration plan outlined in this document to provide its off-shore developers with an assigned, dedicated virtual desktop that is centrally delivered.

Analysis

As previously mentioned, prior to the Analysis phase a select user group was identified to make the transition to a centrally delivered virtual desktop environment. The first part of the analysis process for that user group is to gain a detailed understanding of the user requirements and existing environment configurations. It is also very important to gain the support of the end-user community affected by the migration. Explaining the benefits of the Hosted VDI environment can be very beneficial here, as a group that’s excited about the new functionality will be much more receptive to the project and simplify all aspects of the process. When analyzing this user group, the following items needs to be clarified:

- **Applications and Work Styles.** Understanding which applications are used by this group and how they’re used will be important in ensuring that users have a seamless transition.

- **Data Storage & Profiles.** Determine what end-user and application data is currently stored on local devices, network shares and within user profiles. If data is stored locally on the user’s current physical desktop, a data migration process between the physical and virtual environment should be designed in the next phase.
• **Mapped Network Drives and Logon Scripts.** Actions that occur at logon should generally be replicated in a VDI environment to ensure that the end-user has the same, if not better, experience that they are currently having with their physical environment. In addition, this information is critical for understanding what type of data is being stored on local desktops from a security perspective.

• **Remote Access Requirements.** Understand how users access their environment from inside and outside the office. Remote access requirements may affect firewall and network configurations.

• **Network Bandwidth and High Fidelity Requirements.** Applications that may require video and audio will require higher bandwidth – understanding these requirements and ensure that the network can support them. This will be critical for ensuring a positive end-user experience and developing XenDesktop HDX requirements.

• **Antivirus & Security Requirements.** The current antivirus software deployment process, endpoint scans and security requirements for the existing environment should be understood. Some security requirements can be simplified or eliminated as a result of going to VDI, such as encrypted hard drives since the desktops are now protected in the datacenter.

• **Software Deployment.** The IT organization most likely has a process for updating and patching existing IT supported applications, but this process should also be reviewed for departmental applications.

• **Network.** Details regarding network configurations such as network printer access, DHCP scope, email servers, and domain membership are all important to have defined before creating new virtual desktop base images.

• **Environment Support.** Understand how the end-users currently escalate issues for support. This will help when developing the operational guides and training for both the end-user and helpdesk.

Finally, one other thing to consider in the analysis phase is how to move users to the new environment. Assuming that the existing environment is Windows XP, there are three common scenarios that are often seen in desktop virtualization implementations:

• **1-to-1 Migration.** Users existing machines are copied to the virtual environment. All user settings, programs and data are directly migrated. Time to migrate scales directly to the number of users being migrated, and any configurations on the machine, good or bad, are transferred with the rest of the programs.

• **Clean Migration with IT-base Image.** Users are given a clean virtual desktop with the standard IT image. No harmful content that the user might have installed on the current physical desktop is transferred into the datacenter, and all virtual desktops are fully configured with the latest, most-secure corporate image from IT. However, users may have to customize their new virtual desktop and data may need to be transferred from local physical devices based on existing storage configurations. Migration time is more of a fixed value than the one-to-one migration as base images can quickly be replicated for multiple users.

• **Clean Migration to Windows 7.** Moving to Windows 7 is a major driver for a virtual desktop migration, as many companies have hardware that cannot support the new operating system, and a
Each of the above paths has its benefits and costs, and deciding which method will depend largely on each IT organization and the needs of the business unit. That being said, starting with any of the methods will greatly reduce the difficulty of moving to a new OS or subsequent phase of the Desktop Transformation Model in the future given that a base foundation is now in place.

### Worldwide Co. Example Use Case: Analysis

Susan, a project manager for Worldwide Co, previously identified that the offshore developer group at Worldwide Co. is best situated for a Hosted VDI-based virtual desktop solution given the company’s business priorities and technology roadmap. This group only requires a limited number of applications including development tools (Microsoft Visual Studio 2007) along with several browsers and Microsoft Office. Users are all located at one site in Hyderabad, India and do not work from home. During the analysis phase, Susan assessed the existing environment for the offshore developers. Current developers use aging Windows XP desktops with 1-1.5 gigabytes of memory and occasionally run into memory issues. Data security is a concern for the offshore developers, so Susan understands that she will need to design policies that will prevent information loss. Based on all the criteria Susan identified an assigned, dedicated virtual desktop will provide each offshore developer with a dedicated virtual desktop capable of supporting Windows 7.

### Design

The design phase includes architecting the solution from both the software and hardware point of view. Using estimates gathered from the analysis phase and best practice architecture documents, appropriate hardware for infrastructure and virtual desktop hypervisors can be requisitioned. The goal of the design phase is to have a workable design to execute in the build and test phase.

The following typical actions take place during the design phase:

- **Virtual Desktop Requirements.** For a Hosted VDI virtual desktop model with assigned desktops, the virtual desktop image configurations should be standardized across the identified user group. The desktop image should at least meet the minimum requirements for the desired operating system and best practices recommend providing provisions for performance and future growth.
example, if Windows 7 has a minimum requirement of 1 GB, it might be worthwhile based on the application activities of the end user to provide 1.5 GB or 2 GB of RAM for performance and future application requirements. Virtual desktop requirements for RAM, CPU, and hard drives will determine the number of virtual desktops per physical server.

- **Hypervisor.** Citrix XenDesktop is hypervisor agnostic and can support Microsoft Windows Hyper-V, Citrix XenServer and VMware vSphere. If the organization already has a hypervisor in-house and expertise, the design will be simplified if the new Hosted VDI environment can leverage the existing hypervisor.

- **Hardware Estimation.** Based on the virtual desktop requirements, number of users, and available space on existing hypervisors, if available, then the hardware estimations for a Hosted VDI environment can be calculated.
  - **Scalability Testing.** If there are significant questions around the amount of hardware required to support virtual desktops, scalability testing can be performed to determine the hardware requirements more accurately. For details on scalability testing, reference Citrix eDocs.

- **Security & Anti-Virus.** While most security tools will continue to work in a similar manner, anti-virus should be optimized in the environment, as a standard antivirus definition (such as one with an identically scheduled full drive scan across all desktops) may extend the storage beyond acceptable capacities.

- **Storage.** The decision of whether to use local storage or SAN storage should be decided, and existing references should be used to ensure enough resources exist to support the environment.

- **Windows 7 Migration Considerations.** Some additional considerations should be taken into account if migrating from a Windows XP to Windows 7 environment – this includes profile settings as well as application compatibility in the new environment.

Products generally included in this stage of design will be a Desktop Controller (XenDesktop) infrastructure that manages the VDI environment, a SQL server and a hypervisor that hosts the virtual desktops. If an existing XenServer, Hyper-V or VMware environment already exist, this environment can be leveraged or expanded to be used in the VDI environment.

Additionally, including a remote access solution is highly recommended in this scenario as it will offer some of the largest benefits over a physical desktop to end users. Either an existing VPN solution can be utilized, or Access Gateway can be used to provide secure, integrated access to the virtual desktop environment.

The information gathered around application sets and desktop image customizations during the analysis phase can be utilized here to ensure that all applications will perform as expected. Design decisions around USB mapping, audio, video redirection, graphics intensive applications such as CAD applications and others should be discussed here and included in the design.
Armed with the information gathered during the analysis phase, Susan moves forward with the methodology and engages her IT architecture team to develop a design for the environment. In order to save on expenses, the IT team has determined that all the developers will continue to use their existing computers to save on costs, but will lock them down completely to convert them to essentially thin clients. The new Windows 7 virtual machine will have 2GB of RAM, 50 GB of hard drive, and 1vCPU which is a substantial improvement over their current environment. There are currently 45 developers located in the India office and open head count for 5 more. The developers are currently using a mandatory profile, so there aren’t any personalized user profile settings to migrate between XP and Windows 7. Susan’s team confirmed that the locked down version of XP they are using supports XenDesktop HDX, and she’s done some basic bandwidth testing to ensure that they have enough bandwidth, so no network changes need to occur. Knowing the requirements, Susan’s team decided to purchase two servers with 64GB of RAM, dual quad-core Intel X5550 Processors, and 2x72GB drives. She also purchased a 1TB storage array for direct attached storage between the two servers to support future growth, the virtual machine infrastructure for the environment and the ability to gradually add other non-developer users later on. Susan’s team already had XenServer experience, so the decision was made to utilize XenServer with XenDesktop. All the users will have a dedicated, assigned desktop to keep the migration process simple. Application updates are already deployed via SMS. Active Directory membership and operating system updates are handled via their Windows Server Update Services. McAfee antivirus and firewall will continue to be used, but the scheduled scans will be staggered so that they don’t all occur at the same time. The only additional change that will occur to the end-user thin client is the installation of the Citrix Receiver. The following picture shows a high-level overview of the architecture:
Build & Test

During the build & test phase, hardware is deployed, operating systems are configured, and software is installed. Basic functional testing is completed to ensure that the environment is operating correctly. The goal of this phase is to have a fully functional environment to present to end users to test.

Once the environment has been built and tested at a functional level, business owners that will be transitioning to the new environment should be responsible for validating that all applications are available and working as expected. Time should be allotted for making any requisite updates based on business unit feedback.

Finally, load testing is recommended to ensure that the environment can support the full user set before making the final cut over to production.

**Worldwide Co. Example Case: Build & Test**

Susan’s team took the design decisions from the previous phase and used these to build out a solid architecture. Once all of the components for XenServer and XenDesktop were installed, a base image was created with all of Worldwide Co.’s core applications and settings. Susan’s team tested the image first to fix any obvious issues, then confirmed that the installed applications including Visual Studio worked as expected on Windows 7. Susan then asked the development managers to select representatives to confirm that the image had all of the required software and worked as expected. During this time, Susan’s team tested the XenDesktop functionality of managing and connecting to the environment to ensure that the XD infrastructure and HDX functionality worked as expected.

Rollout

The rollout of the first group can be critical to the success and future delivery of virtual desktops throughout an organization. A smooth rollout can pave the way for future groups to easily encourage adoption. To accomplish this, Citrix Consulting recommends starting off with a pilot group – approximately 10% of the user base testing 100% of the functionality with basic training on how to access the environment and anything they need to consider. Time should be allotted to both gather the feedback and implement the changes.

Depending on the extent of the changes required and feedback received, either a more extensive pilot or a move into production is required. A question Citrix Consulting often receives is whether to allow users to keep using their endpoints as is, or to lock them down to thin client mode. Consulting has seen successes with both methods, though the most effective transition for most companies comes when companies announce that desktop virtualization will be the primary method for business application access, but either way the recommendation is to allow the end-users to access to their existing physical environment during the transition period to ensure that users are properly trained and comfortable within the new system.
Worldwide Co. Example Case: Rollout

With the architecture implemented and the business owners satisfied with the validation testing, Susan’s team moved to the pilot phase. Since the developer managers do not want to impact the overall performance with one massive change, Susan’s team took approximately 10% of the current developers and asked them to use the environment exclusively for one week as a pilot. She requested that they communicate any issues that they experienced to a single contact person that would compile the information. At the end of the pilot, she asked everyone to provide information on their experience. With the results of the pilot, Susan went to her team to ensure that the virtual desktops had the problems resolved. With the pilot testing complete, Susan felt confident that she could roll out the desktops to all of the developers and have them start working immediately.

Now that Susan has a working environment for XenDesktop and a certified base image, she can now roll out virtual desktops to new user groups. Susan’s team took every precautionary measure they could identify to ensure that the helpdesk was trained on the migration and available to escalate issues, the migration was scheduled during an off-hour, and a complete rollback plan was put in place just in case of an emergency.

Susan knew that having demonstrated a successful deployment with one user group would make it much easier for additional user groups to buy-in and integrating additional features to optimize the environment now becomes much simpler as the environment is centralized in one location on one hardware stack.
Conclusion

The transition from a physical to virtual desktop can be simple and impactful at the same time. By taking this simplified approach to desktop virtualization IT organizations can truly assess the greater impact of the solution and begin the 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 turn-around 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.
Revision History

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