

# EIGHT COMMON PITFALLS OF APP AND DESKTOP VIRTUALIZATION AND HOW TO AVOID THEM

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Avoid the Pitfalls—and Deliver a Desktop-Like Experience. . . . .11

## Get on the Path to a Successful Deployment

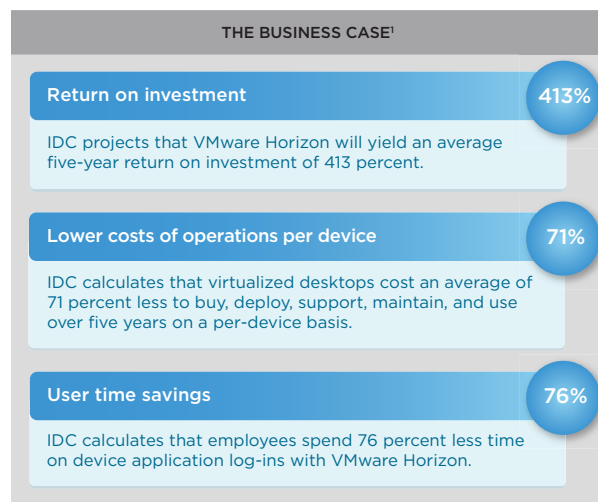
Across a wide spectrum of industries, the consumerization of IT is driving digital transformation. Cloud and mobility are changing the way people work and live—and creating new requirements for the delivery of IT services and a rethinking of management tools and processes.

To support a dynamic workforce in the era of consumerization, IT organizations need to move from the traditional desktop model to new, more fluid digital workspaces that are tuned for mobility, a workforce using new device form factors, and the agile delivery of new apps. The virtualization of Windows desktops and apps is one of the keys to enabling this shift to digital workspaces.

In a typical route forward, IT shops leverage virtual desktop infrastructure (VDI) to virtualize desktops and Remote Desktop Session Host (RDSH) to virtualize applications. This path to the future has a great deal of momentum—and proven benefits. IDC recently reported that organizations are seeing greater than 300 percent ROI from VDI and RDSH deployments while receiving significant business value.<sup>1</sup> Findings like these underscore the well-documented benefits of desktop and app virtualization.

For your IT administrators, VDI and RDSH solutions can reduce desktop administrative and management tasks and enable applications to be easily added, patched, and upgraded. They also allow your administrators to manage security and data protection from a central point of control, which can provide the business with a lower total cost of ownership and enhanced data protection.

These are just a few of the many benefits of running desktop operating systems and applications on virtual machines that are hosted on premises in the data center or off-premises in the cloud and accessed via desktop clients or mobile devices. However, as many IT administrators have learned, there's a catch: The benefits of desktop and app virtualization don't come without change and a fair amount of risk.



1. IDC, "The Business Value of VMware Horizon," January 2016.

## Pitfalls on the Project Path

VDI and RDSH change the way desktops and apps are delivered to users, and the success of an IT project path is lined with potential pitfalls. These pitfalls can stop you at any stage of a VDI or RDSH deployment, from initial planning to the rollout of production systems. If you don't avoid them, you run the risk of disrupting ongoing business operations, losing staff productivity, and creating unhappy end users.

In worse cases, if users can't perform their jobs because they can't access their desktops and applications, business operations might come to a halt. And in some industries, an inability to access desktops and applications could be even more damaging. Healthcare professionals, for example, might be impeded in their efforts to make life-and-death decisions and administer quality treatments at the point of care.

Given the high stakes, the message to project planners should be clear: When you launch a VDI or RDSH initiative, you are going to impact the daily lives of people throughout your organization. You can't afford to make mistakes. This reality points to the need to avoid the common pitfalls of VDI and RDSH projects—eight of which are summarized in this paper.

### Pitfall 1: Not Involving Users

From the outset of a VDI or RDSH project, end-user involvement is essential to help your project team understand how workers perform their day-to-day jobs. With an RDSH deployment, for example, you're serving up apps instead of full desktops, so you have to understand how the users interact with the software. This end-user perspective is one of the keys to ensuring you have gathered the full range of user and business requirements and have a clear definition of the problem you are solving.

Clear, widespread communication is one of the keys to project success. For IT, it's important to involve all parties early on, to start with a blank drawing, and to engage everyone in the process of moving forward. For end users, it's important that they know what's coming. To that end, set up a schedule for periodic mailings that talk about the upcoming changes and the benefits they will bring.

Another best practice is to take a step back and consider what you are trying to achieve, before you think about IT requirements. For example, a desktop project that is focused on reducing costs will have very different requirements and priorities than a project like publishing an app with RDSH, which might be aimed at enhancing functionality. Instead of diving straight into technical requirements, such as numbers of servers and sizing of WAN links, begin by exploring user needs, business drivers, and special requirements. These special requirements might include compliance issues, high availability, disaster recovery plans, or even the need for the business to rapidly on-board large numbers of new users due to mergers or acquisitions.

User involvement in the design process is also one of the keys to managing expectations and, ultimately, gaining acceptance of the resulting solution. Even the most technically well-executed VDI or RDSH project can fail if enough users have the perception that it does not meet their needs or expectations.

**How to Avoid This Pitfall**

Users who have input into the design of the environment are more likely to be supportive of the end product. Users are key stakeholders in any app and desktop virtualization project, and they should be treated as such, as their acceptance and use of the solution will be the ultimate key performance indicator on which the success of the project is judged.

For example, as healthcare clinicians travel within and between facilities with their mobile devices, they need fast access to patient and diagnostic data, including high-resolution medical image files from picture archiving and communication systems (PACS). In such a case, it would be critical to gather requirements for response times, medical image views per minute, and other metrics to deliver the right solution.

The message should be clear: Involve the users throughout the life of the project. Interview representatives from the business units to understand their requirements and what they perceive as the current shortcomings of the existing desktop environment. During rollout, provide users with a questionnaire to give them the opportunity to express their opinions of the deployment.

**Pitfall 2: Putting Together the Wrong Team**

A common mistake of app and desktop virtualization projects is to build a team around virtualization architects rather than desktop and app administrators. While it may seem logical to begin with the people in your organization who best understand virtualization, the reality is virtualizing desktops and apps is quite different from virtualizing infrastructure.

For example, administrators who are skilled in virtualization typically don't build their own workloads, such as desktop images and virtualized apps. They tend to be more focused on operating servers in a virtualized environment. In the new world, you have to consider how you will manage virtualized desktops over time and how you will manage applications independently from desktop images and user preference for personalization.

**How to Avoid This Pitfall**

For a successful project, you need the close involvement of the people in your organization who design and manage desktop and application environments. For example, with desktops now hosted in the data center, it is important that the storage systems hosting the desktops and the networks used to access them are properly designed, so you will also need the involvement of storage, server, and network specialists. Coordination and collaboration are keys to success here.

It's also important to focus on skills development, to help your current IT administrators become masters of your virtualized desktop and app environment. The good news: There are lots of resources to draw on for skills development, including certification courses from technology vendors, involvement with user groups, and interaction with IT administrators from other companies that are on the same path.

### Pitfall 3: Defining App and Desktop Virtualization Use Cases Improperly

App and desktop virtualization use cases are built on types of workers and their job requirements, the applications and devices they use, their requirements for storage and multimedia performance, and their network connectivity restraints. Given this reality, it's important to consider the culture of the organization and its attitudes toward the use of infrastructure when defining culture and workflow requirements. Does the organization allow multimedia streaming? Does it have teleworkers who watch high-definition video? The answers to questions like these should be factored into use cases.

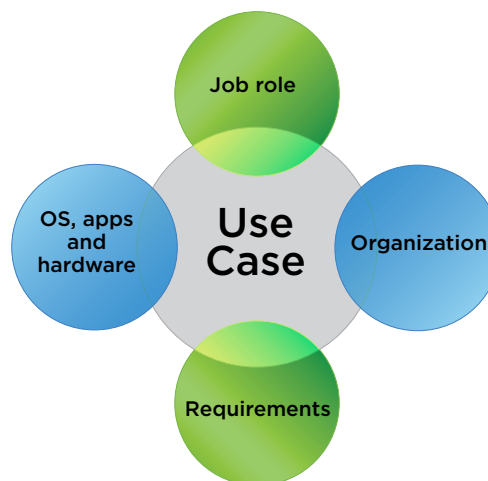
For example, if some workers need to stream video as part of their jobs, you might want to let video streaming run natively on laptops and publish just the most sensitive data through RDSH infrastructure. Or, if users have no business requirement to stream video but the practice is allowed in the work environment and frequently done, you would want to consider the impact of video streaming in the design of a VDI solution. Traditional desktops typically provide an abundance of resources to users and saturation of a resource will not affect other users, but with VDI resources are shared and utilization of resources is designed to be more efficient.

The ultimate goal here is to ensure that users receive the resources and system performance appropriate for the work they do and the way they currently perform their tasks.

#### How to Avoid This Pitfall

In developing use cases, take care to not oversimplify, such as lumping lots of workers into a generic category called "office worker." In practice, different users within the same office setting likely run different applications and have varying performance requirements.

For example, users in accounting may need to use specific accounting applications or large spreadsheets, while users in human resources might use Microsoft Word and web-based applications. While both are categorized as "office workers," they use different applications and have different performance requirements. The goal is to create enough use cases to cover the full range of requirements of different types of users without creating a lot of special-needs desktops.



#### Pitfall 4: Not Conducting a Pre-Assessment

The desktop and application pre-assessment helps you gain an understanding of the workloads that will run in the virtualized client environment and their associated technical requirements. The information gathered in this phase of a project is critically important to the design of the VDI or RDSH solution. Without a pre-assessment, assumptions will be used to design the solution, which adds risk to the project. For example, the selected hardware may not be able to provide the required compute or storage resources, which could lead to additional capital investments that could have been avoided if the solution had been sized properly.

The pre-assessment considers the applications people are using, how long it takes to launch them on a physical desktop, and how they perform on a physical desktop. The pre-assessment can be useful to determine how many users are actually using specific applications, which may impact the way the applications are delivered to the users or the license requirements for the applications. The pre-assessment also considers utilization of CPUs, memory, disk, and network bandwidth in the physical systems—considerations that are crucial in properly sizing the underlying infrastructure.

##### **How to Avoid This Pitfall**

A number of vendors provide desktop and application pre-assessment software. These products typically use an agent installed on the local desktop that feeds metrics into a central reporting server. Reports can be generated from the administrative console to provide a detailed analysis of the current desktop environment. The reports generated by the pre-assessment software give you key metrics about the performance of your existing environment, so a VDI environment can be properly designed to meet the performance and latency requirements of your end users.

#### Pitfall 5: Not Properly Optimizing the Desktop Image or Considering an RDSH Deployment

A common pitfall is to not properly optimize the standard operating environment (SOE) for VDI (via a desktop image) or RDSH (via a server image). This skipped step might stem, for example, from a mindset to manage virtual desktops the same way existing physical desktops are managed. In reality, virtual desktops are quite different from physical desktops, in part because they live in a world of shared resources, and they should be optimized accordingly.

Optimizations for virtual desktops include disabling unused Windows services, streamlining the Windows user experience, and ensuring the optimal virtual hardware is selected. When applied across an environment, optimizations of the desktop image can save precious resources, such as network bandwidth and storage capacity, while enabling a better user experience. However, keep in mind that there is also the risk of over-optimization of the desktop image. You can over-optimize to the point of affecting system usability by disabling services that the users or applications may need or expect.

**How to Avoid This Pitfall**

To avoid this pitfall, you have to work with users by conducting surveys or workshops with business unit representatives to understand the impact of optimizations. For example, while it may reduce bandwidth consumption, how will users react if you disable their desktop themes? And although it may help reduce disk growth, what will happen if you disable the recycling bin in the desktop image? Will users accidentally delete files? Or how will users react if you turn off graphics modes or printer access? You want to understand the answers to questions like these before you move down the optimization path.

In the case of an RDSH deployment, you might want to create a server silo dedicated to a particular app. This approach helps you remove a lot of the variability from the app maintenance equation. In addition, it might be advantageous to deploy RDSH server images to further define what is delivered and to scale and manage updates. Or you might leverage a server with a GPU to increase availability by offloading graphics compression from the CPU. You might then be able to run 20 to 30 videos with a GPU without negatively impacting the performance of the CPU.

Another way to solve this problem is to leverage the VMware App Stacks™ feature in VMware App Volumes™, a suite of software designed to provide fast application delivery and unified management. The App Stacks feature allows you to deliver app stacks more efficiently by injecting them into the VM as a user logs in, rather than building them into the server image. This approach allows for the temporary enablement of an application based on a specific user profile.

## Pitfall 6: Not Understanding Impacts to the Performance of Other Systems

In a traditional desktop environment, each user had full access to his or her own disk spindle (or dedicated flash drive), and poor network bandwidth for WAN sites could often be tolerated. When moving to VDI, it is important to understand the full range of performance impacts stemming from network bandwidth, storage area network (SAN) array processor utilization, and display protocols. All of these variables can affect application performance. However, in some cases application performance will improve over the WAN as the actual data between client and server apps remains in the data center.

**How to Avoid This Pitfall**

While VMware Horizon® Planner can provide a synthetic workload for benchmarking performance, ideally the performance impacts should be fully explored through engagement with users. Your users can help you generate realistic proof-of-concept or pilot workloads to validate their requirements for graphic bandwidth, storage, I/O, and more.

Network bandwidth is an especially important consideration on wide area network (WAN) links. If your WAN links cannot provide the bandwidth for a VDI environment or the latency is too high, then you might want to consider local deployments. Also, while your SAN arrays might initially be able to handle the workload of the pilot, particularly if shared with other workloads, they may represent a performance cliff and cause a sudden degradation of performance as the environment scales.



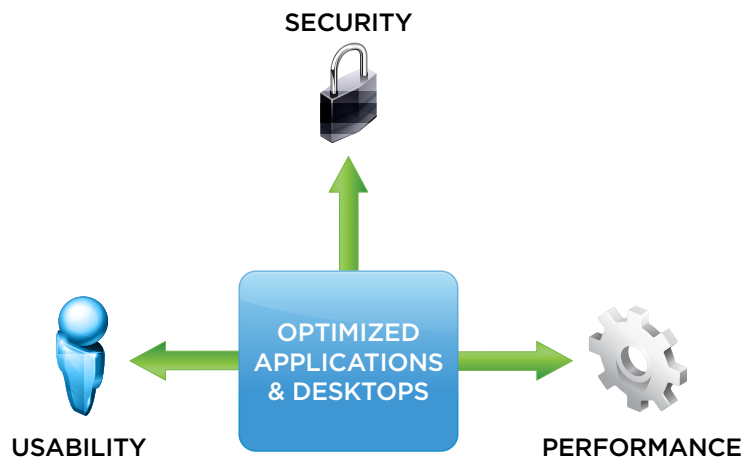
### Pitfall 7: Not Developing an Application Deployment Strategy

An organization with several thousand employees might have users on a couple hundred different applications, including specialty products for particular job functions. The organization may have existing application deployment strategies for commonly used applications but specialty applications may have been overlooked because it was easier to simply install these applications for the small number of users who required them.

Cases like these underscore the needs for a deployment strategy for all applications. The application deployment strategy will have a direct impact on the way the virtual desktop environment is designed. If applications are installed on user login, this limits the design choices, but a VDI or RDSH environment can still be properly designed to meet this constraint.

One best practice is to do such tasks in parallel to help your project team meet your deployment timelines. For example, you might perform virtualization and imaging tasks in parallel to drive toward a time-efficient deployment.

In addition, in deploying an RDSH-based VMware Horizon solution, you should take into account a number of technical and operational considerations and best practices. Areas to consider here include ESXi host sizing, RDSH image configuration and optimization, Horizon configuration and policies, antivirus solutions, provisioning, and “Day 2” operations, such as recurring maintenance.



**How to Avoid This Pitfall**

Before rolling out a VDI or RDSH environment, you need a clear understanding of how you will deploy, update, and manage applications that are common across the user base, that are used only by certain user groups, and that are used by just one or two users.

Consider how applications will be packaged and the impact on performance if updates need to be pushed out to a large number of desktops in a short amount of time. Application virtualization may be challenging for some applications but could provide management benefits that outweigh the costs to package the applications.

One way to enable faster delivery of desktops and applications delivery is to leverage the capabilities of VMware App Volumes. VMware App Volumes is a portfolio of application and user management solutions for Horizon, Citrix XenApp and XenDesktop, and RDSH virtual environments. App Volumes is a key component of Just-in-time Management Platform (JMP), the next generation desktop and application delivery platform from VMware. JMP untangles the operating system, applications, and user personalization. By doing so, all component pieces can be reconstituted on demand to deliver just-in-time desktops and apps across any infrastructure topologies and to any device.

**Pitfall 8: Skipping or Mismanaging the Pilot Project**

Organizations that skip the pilot phase, or run a pilot that doesn't produce a clear outcome, risk failure when an environment goes into production or never moves out of the pilot phase. The pilot should have clearly defined objectives and a specified timeframe. Objectives of the pilot may include validating the performance data used to size the environment and surveying end users. These are critical steps in the development of a VDI or RDSH solution.

**How to Avoid This Pitfall**

A properly managed pilot should engage real users from various use cases to pilot the environment and generate meaningful load data. While often the first to want to use the VDI environment, IT administrators are not a good group to base the pilot on, as they are not representative of your entire organization's user base.

If the goal is to include an executive user in the pilot, ensure the environment has been thoroughly tested and the support processes are in place to provide the service level this user would require. In general, the pilot should also engage the desktop support teams to provide end-user support to prevent the project team from attempting to provide 24x7 support to users.

### Avoid the Pitfalls—and Deliver a Desktop-Like Experience

A well designed VDI or RDSH environment can provide users with most of the functionality and performance of desktop operating systems and applications along with higher availability and a lower risk of hardware failure.

To achieve these benefits in your environment, you need to avoid the common pitfalls in VDI projects. One overarching way to do just this is to follow proven practices for success, such as those explained our *Best Practices for Published Applications and Desktops*.

Another overarching way to stay on the path to success is to take proactive steps to understand the business drivers for your projects. Identify your technical requirements. Involve users in the requirements gathering, and run a pilot with real users. Then take steps to optimize the design of your VDI or RDSH environment to deliver a desktop-like experience in your virtualized environment.

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