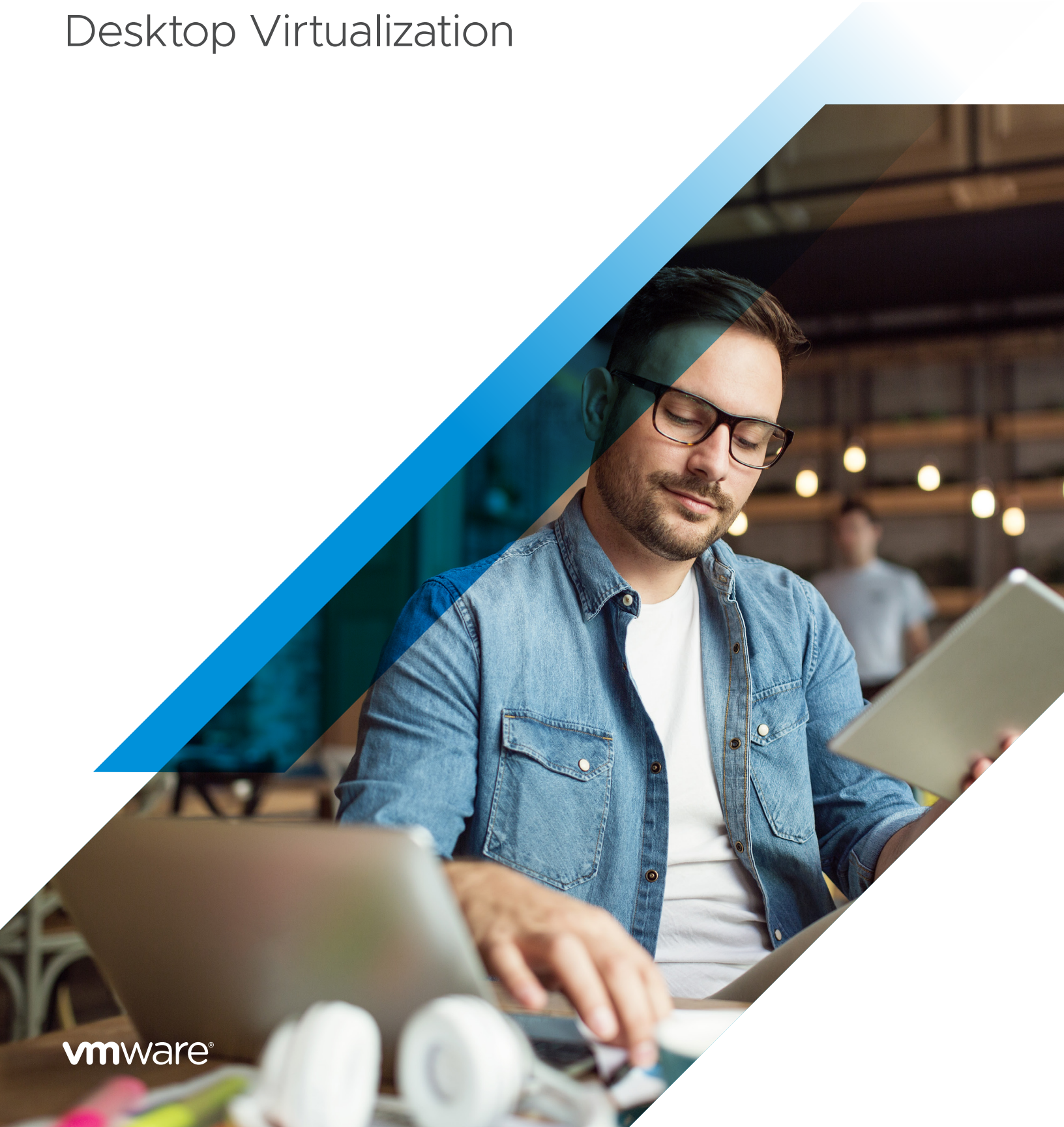
Avoiding the 9 Common Hazards of App and Desktop Virtualization



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Get on the Path to a Successful Deployment

Across industries, cloud and mobility are changing the way we work and live. Accessing and using personal apps and data on smart phones is so easy that people expect the same ease around the apps and data they need to do their jobs.

To support these changing expectations, more IT organizations are moving away from the traditional desktop model to new, more fluid digital workspaces. Their goal is to find solutions designed with mobility in mind, solutions that make it faster and easier to deliver traditional and new apps to a workforce that is continually adopting new device form factors. Solutions that support BYO devices used by employees, and non-corporate-owned devices used by contractors. Solutions that ensure security at every level, to keep both private data and corporate data safe.

IDC recently reported that organizations are seeing greater than 300 percent ROI from VDI and RDSH deployments while receiving significant business value.[1] Findings like these underscore the well-documented benefits of desktop and app virtualization.

One of the tools enabling this shift to digital workspaces is the virtualization of Windows desktops and apps.

Many IT shops leverage virtual desktop infrastructure (VDI) to virtualize desktops and Remote Desktop Session Host (RDSH) to virtualize applications. This approach has a great deal of momentum—and proven benefits.

For your IT administrators, VDI and RDSH solutions can reduce their 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 (TCO) 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 come with a fair amount of risk.

Hazards on the Project Path

VDI and RDSH change the way IT delivers desktops and apps to users—yet the success of an IT project path has many potential hazards. These hazards 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 plan for how to avoid them, you run the risk of disrupting ongoing business operations, slowing 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, the 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 will impact the daily lives of people throughout your organization. You can't afford to make mistakes. This reality points to the need to understand and avoid the common pitfalls of VDI and RDSH projects. This paper summarizes nine hazards that everyone planning a VDI project should consider.

[1] Gartner Report: Predicts 2019: Mobile and Endpoint Technologies, Manjunath Bhat, Michael Silver, Federica Troni, Annette Jump,Nathan Hill,Bryan Taylor, Stephen Kleynhans,Rob Smith, 5 December 2018.

Hazard 1: Not Involving Users

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

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

Another best practice is to take a step back before you think about IT requirements and consider what you are trying to achieve. For example, a desktop project focused on reducing costs has very different requirements and priorities than a project aimed at enhancing functionality, which might involve publishing an app with RDSH. 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 requirements might include compliance issues, high availability, disaster recovery plans, or even the need for the business to rapidly onboard 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 widespread user acceptance of the resulting solution. Even the most technically well-executed VDI or RDSH project can fail if enough users believe that it doesn't meet their needs or expectations.

How to Avoid This Hazard

When you give users input into the design of the environment, they're more likely to be supportive of the end product. Users are key stakeholders in any app and desktop virtualization project, and should be treated as such. Their acceptance and use of the solution will be the ultimate key performance indicator for the success of the project.

For example, as healthcare clinicians travel from room to room 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.

Whatever the use case or environment, it's vital to involve 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 on the deployment.

Hazard 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 that virtualizing desktops and apps is quite different from virtualizing infrastructure.

For example, administrators 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.

Even the need for the virtualization role is changing. With new Desktop-as-a-Service offerings, and VMware Horizon® Cloud Service™ for on-premises deployments, the virtual desktop and app administrator role is further abstracted from the underlying infrastructure.

How to Avoid This Hazard

IT organizations must take a fresh look at the roles and skill sets their teams truly need. A successful project requires 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, as environments and technologies continue to change. The good news: There are many 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.

Hazard 3: Defining App and Desktop Virtualization Use Cases Improperly

App and desktop virtualization use cases are built using several key considerations, including: 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 these complexities, 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 remote or mobile workers 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. With VDI, resources are shared and utilization of resources is designed to be more efficient.

The ultimate goal 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 Hazard

Clearly identifying different user requirements and balancing the needs of end users and IT can help you to define user segments. Take care to not oversimplify, such as lumping many people into a generic category called "office worker." Even "on-site" and "remote" categories can be too broad. In practice, different users within the same office setting likely run different applications and will have varying performance requirements.

Once you've developed user segments, you can define use cases, and ultimately build services. 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. Salespeople may have mobile use cases that people in other departments do not. While these might all be categorized as "office workers," their needs vary. The goal is to create enough use cases to cover the full range of requirements and services without creating a lot of special-needs desktops.

Hazard 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, you risk designing a solution based on assumptions that could be outdated, false, or incomplete. For example, the hardware you select 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 use, 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 you deliver applications to them 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 Hazard

Several 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. These reports provide key metrics about the performance of your existing environment, so that you can design a VDI environment to meet the performance and latency requirements of your end users.

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

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

Optimization strategies 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 Hazard

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? Though 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.

Your strategy will change based on whether you support the environment with on-premises or cloud-based systems. Ideally, you want the ability to decouple components of a desktop or RDSH server and manage them independently in a centralized manner, while being able to reconstitute them on demand to deliver a personalized user workspace when needed.

For on-premises systems in 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.

If you are juggling both on-premises and cloud-based systems, a simple, effective solution can be found in VMware App Volumes,™ a suite of software designed to provide fast application delivery and unified management. App Volumes uses a modern architecture to allow you to deliver desktops and apps across any infrastructure, to any device. You can more easily meet the needs of different types of users with the ability to deliver, update, manage, and monitor applications and users across virtual desktop (VDI) and published application environments.

Hazard 6: Not Understanding Impacts to the Performance of Other Systems

In a traditional desktop environment, each user has full access to their own disk spindle (or dedicated flash drive), which means poor network bandwidth for WAN sites can often be tolerated. When moving to VDI, it is important to understand the many ways performance can be impacted—stemming from network bandwidth, storage area network (SAN) array processor utilization, and display protocols. All of these variables can negatively affect application performance, though 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 Hazard

While VMware Horizon® Planner or tools like LoginVSI 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.

Using a validated HCI solution that integrates compute, networking, and storage in a single stack can make a significant difference. Building environments with VMware Cloud Foundation™ based on tested cloud-pod architectures simplifies the approach to designing appropriate architecture.

Network bandwidth is an especially important consideration on wide area network (WAN) links. Start by modeling the workload and tuning the protocols for desired results. If your WAN links cannot provide the bandwidth required for a VDI environment or the latency is too high, 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.

Consider moving to SD-WAN for branch or remote networking use cases, which enables consistent direct access to enterprise and cloud applications, and data. SD-WAN provides software-defined flexibility with automation and business-policy abstraction, which simplifies the complexities of traffic routing and policy definitions.

Hazard 7: Not Developing an Application Deployment Strategy

An enterprise with several thousand employees might have users on a couple hundred different applications, including specialty products for particular job functions. The company may have existing application deployment strategies for commonly used applications but may have overlooked specialty applications, 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 consistent 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 tackle such tasks in parallel to help your project team meet deployment timelines. For example, you might perform virtualization and imaging tasks in parallel to deploy faster.

In deploying an RDSH-based VMware Horizon solution, you should also pay attention to technical and operational considerations and best practices. Areas to consider 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 Hazard

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, those that are used only by certain user groups, and those that have only 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 cost of packaging them..

One way to enable faster delivery of desktops and applications is to leverage the capabilities of VMware App Volumes,™ a portfolio of industry-leading application and user management solutions for Horizon, Citrix XenApp, Citrix 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.

Hazard 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 Hazard

A properly managed pilot should engage real users from various use cases to pilot the environment and generate meaningful load data. IT administrators are often the most eager to use the VDI environment, but don't base your pilot on them: they aren't 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 24/7 support to users.

After you gather and analyze findings from your pilot project, you may choose to build only VDI or only published application services with Horizon—or you may choose to do both. That's why it's so important to go into the pilot without a rigid project plan.

Hazard 9: Not Considering Cloud-Based Tools

As with many of the prior hazards, this last one stems from starting a VDI project without testing prior assumptions. You might assume that your security needs require an on-premises solution—but some cloud-based services that allow you to achieve ease of management without sacrificing security.

By limiting yourself to an on-premises solution, you may not be able to scale up as quickly as you need to in the future.

How to Avoid This Hazard

Horizon Cloud Service, when used with on-premises instances of Horizon in your data center, makes it easier to manage and deliver desktop and application workloads. Together, they allow you to achieve the benefits of virtual desktops and hosted apps with:

- Multi-datacenter brokering
- Centralized updates and Horizon environment maintenance
- Centralized image management
- Centralized application lifecycle management
- Centralized monitoring and intelligence

With a truly modern desktop and application delivery architecture, you can provision desktops in seconds, reduce storage and operational costs, and ensure painless application packaging and installation.

Avoid the Hazards—and Deliver a Desktop-Like Experience

A well-designed VDI or RDSH environment helps you give users the ability to do their best work, wherever they go, without compromising performance or security. It provides most of the functionality and performance of desktop operating systems and applications, along with higher availability and a lower risk of hardware failure.

A successful strategy starts by studying these hazards, then taking the necessary steps to avoid them. Take the time 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 optimize the design of your VDI or RDSH environment to deliver a desktop-like experience in your virtualized environment. An additional resource on proven practices for success is contained in our Best Practices for Published Applications and Desktops.

VMware Horizon 7 provides the necessary capabilities to help you deliver virtual desktops and apps in a single unified workspace. Horizon goes beyond other VDI solutions, allowing you to provide end users with one place to securely access all their desktops, applications, and online services from any device, everywhere.

Take the Next Step

TRANSFORM YOUR VDI

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