



How far will you take virtual?

**Competitive Comparison Between Microsoft® and
VMware Desktop Virtualization Solutions**

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Introduction

Virtualization has helped organizations reduce cost and increase efficiency in the datacenter, and new virtualization products are available to help organizations with their desktop challenges as well. Any investment in virtualization needs to be carefully considered and planned effectively to realize business benefits in the longer term. By making desktop virtualization a part of a broader strategy to increase desktop flexibility, manageability, and security, organizations can increase user productivity and decrease IT costs.

Microsoft® has the industry's widest range of desktop virtualization and management products that can be flexibly combined to address a range of customer challenges and produce a best-fit solution for many different scenarios. From scenarios where users need greater data or application mobility to scenarios with demanding compliance requirements, Microsoft's desktop virtualization solution can deliver benefits without the high cost of competing solutions.

Microsoft's System Center integrated management suite provides comprehensive desktop management for both physical and virtual desktops. Improved desktop management has always been the most effective way to lower Total Cost of Ownership (TCO), and Microsoft System Center is the industry's most comprehensive management suite. System Center manages both desktops and servers, provides extensive monitoring and management control, and helps IT staff resolve problems quickly by showing causal relationships between components through an integrated management console.

Desktop Virtualization Approaches

VMware's desktop virtualization approach is structured around selling a Virtual Desktop Infrastructure (VDI)-based solution. While this approach may add useful functionality, it often forces customers to add VDI infrastructure which may not be the most effective virtualization solution to overcome the challenges at hand. And while VMware's desktop virtualization offerings provide application virtualization and operating system virtualization for client computers, these services are delivered through VMware's VDI backbone and its inherent shortcomings discussed below.

Microsoft takes a more nuanced approach to desktop virtualization offering a range of desktop virtualization and management products. These products can be flexibly combined to create a better fit between an organization's desktop management challenges and the software used to meet those challenges. Microsoft also believes that effective management tools are essential and accordingly has built a comprehensive suite of management tools to enable customers to reap the most out of virtualization.

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This paper will examine the platform offerings and management tools that Microsoft and VMware have brought to market in the desktop virtualization space. With a good understanding of the design approach of each company around desktop virtualization, customers will be able to make informed decisions around which solution will work best in their respective environments.

Microsoft's Desktop Virtualization

Microsoft's desktop virtualization solution offers a broad portfolio of products, designed to help customers with a wide array of desktop and application management challenges. Figure 1 below describes the products in Microsoft's solution.

Function	User Data and Profile Virtualization	Enterprise Desktop OS Virtualization	Application Virtualization	Application Virtualization	Session Virtualization	VDI
All products managed with Microsoft System Center						
Product	Windows User Profiles and Folder Redirection	MED-V	App-V for Desktops	APP-V for RDS	Remote Desktop Services	VDI Suite
Benefits	Lowest cost desktop virtualization	Used to enhance application to operating system compatibility	Reduces application maintenance effort and disk footprint, increases application to application compatibility	Improves server consolidation and infrastructure utilization by allowing more applications to co-exist on a single terminal server	Delivers session-based desktops or applications, well-suited for low complexity or high user density scenarios	Provides cost effective and comprehensive VDI solution for low complexity deployments

Figure 1 Microsoft Desktop Virtualization Product Portfolio

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User Profiles and Folder Redirection

Built into Microsoft Windows®, User Profile and Folder Redirection isolates user data and settings from PCs and enables storage of this information in a datacenter instead of locally. From this central store, several other Windows technologies – such as Windows Roaming User Profiles, Windows Folder Redirection, and Offline Files – enable users to access their data and settings from any PC. The benefits of using this type of virtualization – often called User State Virtualization – is that it enables easily replaceable PCs for business continuity, centralized backup and storage of user data and settings, end user access to their data from any PC, and simplified PC provisioning and deployment. On rich clients, user data can be cached for offline access and then automatically synchronized with datacenter servers upon re-connection to the network. MDOP Microsoft Desktop Optimization Pack (MDOP) is a suite of Windows virtualization and manageability technologies that decreases desktop TCO by making users productive anywhere, giving IT greater control of desktops, and simplifying PC manageability. MDOP is regularly updated, and lets customers continuously enhance desktop manageability practices and user experiences.

The Microsoft Desktop Optimization Pack enables IT professionals to better manage desktop Windows environments by:

- Minimizing desktop down time with diagnostic and recovery tools.
 - Accelerating application and operating system deployments and manageability using application and desktop virtualization.
- Enhancing control with advanced group policy and comprehensive manageability of virtual machines on desktops.
- Tracking application usage to improve license compliance and reduce overbuying of software licenses.
- Transforming applications into centrally managed, on-demand services which are available when and where needed.

All of these benefits result in immediate ROI, improved end user experience, better IT responsiveness, predictable desktop deployment, and decreased TCO.

Make People Productive Anywhere

One of the core challenges that MDOP addresses is that of user productivity, which suffers when application delivery time to production takes too long. In addition, operating system or application failure also decreases user productivity. As organizations face more dynamic conditions in the business environment, they require greater flexibility for user location and roaming. MDOP helps address issues like:

- Users lose application settings when moving from one computer to another.
- Difficulty in assuring availability of crucial tools and applications from anywhere.
- Many localized applications are on servers, constraining access for roaming users.
- Reduced productivity due to computer or application failures.

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- Difficulty in working at home without company laptops.

Enhance Control

Creating an effective balance between client computer manageability and local user control has always been challenging. Unauthorized or pirated software, applications that require administrative level access, and inadequate control over local virtual machine images are a few of the issues that challenge IT department control over client computers.

MDOP provides tools to address these challenges. Application virtualization with App-V breaks the deadlock between applications that require local administrator access and the lack of control introduced by this requirement. The greater integration of Microsoft Enterprise Desktop Virtualization (MED-V) provides much-needed control over local virtual machine images and a reduction in help-desk calls and user training requirements.

Streamline PC Manageability

Traditionally, software has been tightly bound to hardware and operating systems, making it difficult and costly for IT to adapt quickly to business changes and deliver computing resources based on real-time needs. Often, multiple operating system images must be supported for different departments, hardware configurations, and classes of users. IT managers never know which applications will conflict, therefore, they can spend weeks regression testing and staging them before deployment.

MDOP helps address issues like these:

- Application provisioning is slow because of an overburdened IT help desk.
- The OS deployment process is a complex series of disconnected tasks that span multiple sources, targets and security models.
- Lengthy application regression delays bringing applications, OS images and patches to production.
- IT managers can't deliver continuously updated applications to end users because today they are installed on specific hardware and operating systems. This traditional method of managing software does not adapt well to the introduction and manageability of new and updated applications, operating systems, or business changes.
- IT managers are under pressure to reduce the costs of managing desktops and at the same time improve service and end user experience.
- OS compatibility issues prevent application deployment on Windows 7 or Vista computers.

App-V

Microsoft Application Virtualization (App-V) transforms applications into centrally managed services that are never installed, never conflict, and are streamed on-demand to users. App-V can be used for physical, virtual and session-based desktops. It is available to customers via MDOP, as part of the Remote Desktop Services CAL or via Microsoft's Service Provider Access License (SPLA).

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The modern business desktop uses many applications, and their performance and availability is critical to user productivity. Without App-V, applications are only available where they are installed, which ties users to computers.

App-V significantly simplifies and [reduces TCO](#) related to the application lifecycle of packaging, testing, deploying, updating and deprovisioning applications and removes many of the time-consuming steps in the process for both IT and end users. App-V transforms applications into centrally managed virtual services that are never installed and, because each application executes inside its own virtual space, it does not conflict with other applications.

With App-V, desktop administration becomes a simpler, automated process for enterprise IT organizations. Moreover, when you need to re-deploy your applications as part of a Windows 7 upgrade, for example, you can benefit even more by using App-V to:

- Reduce the costs of application packaging, testing, deployment and increase user productivity.
- Reduce base image footprint and accelerate new PC provisioning time.
- Lessen end user impacts typically associated with application upgrades, patching, and deprovisioning.
- Seamless integration with Windows 7 capabilities including the new user interface, AppLocker, BitLocker™ ToGo, and BranchCache.
- Maintain Windows 7 user experience and productivity with virtual applications that behave just like regularly installed applications.
- Accelerate your adoption of Office 2010 with App-V
- Deploy 32 and 64-bit applications to both x86 and x64 Windows platforms.
- Reduce SAN storage by using a cache of virtualized applications that is shared across all VDI desktops, saving gigabytes of space, eliminating duplication, and enabling faster application launch.

App-V and System Center Configuration Manager integration brings full PC lifecycle management to enterprise customers by providing the ability to manage and deploy both physical and virtual applications with one solution. The combined solution includes seamless integration with System Center Configuration Manager software distribution to both users and machines. System Center Configuration Manager enables administrators to centrally manage the entire desktop lifecycle from the initial deployment of operating systems and applications to the updating software and hardware to desktop and laptop computers independent of location.

App-V provides benefits that are not available with VMware's ThinApp. Because App-V uses a client agent and has a scalable server-side infrastructure, it has support for application streaming over RTSP and HTTP, client-side application caching, and comprehensive management and reporting features. The list below describes App-V features that have no counterpart in VMware ThinApp:

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- Support both 32 and 64 bit apps on X86 and X64 platforms
- Secure RTSP or HTTP application streaming available.
- Client-side application caching.
- Ability to target and deploy virtual applications to computers.
- Ability to target and deploy virtual applications to users.
- Reporting and management for both virtual and physical applications.
- Inventory and license metering for virtual applications.
- Centralized status reporting.
- Supports Internet-based virtual application delivery and management.

MED-V

When facing an upgrade to a new version of Windows, IT departments typically map and test all of their line of business applications on the new operating system. While Microsoft offers a variety of methods and tools to address applications that are not working properly, in every organization there will be a subset of applications that are not yet officially supported by their manufacturer, or might not work at all despite all efforts. The process of testing, fixing the application, upgrading to a new version that supports Windows 7, for example, or finding an alternative application can be time-consuming. Meanwhile, users are unable to take advantage of the operating system's new capabilities and enhancements, and IT departments have to delay their upgrade plans.

MED-V removes the barriers to Windows upgrades by resolving application incompatibility with Windows Vista or Windows 7. MED-V delivers applications in a Virtual PC that runs a previous version of the operating system (for example, Windows XP). And it does so in a way that is completely seamless and transparent to the user. Applications appear and operate as if they were installed on the desktop, so that users can even pin them to the task bar. For IT administrators, MED-V helps deploy, provision, control, and support the virtual environments.

MED-V offers several advantages:

- Enable incompatible applications.
- Accelerate the upgrade path to Windows 7.
- Incompatible or unsupported applications continue to run in a virtual environment with a previous operating system version, seamlessly integrated into the Windows 7 desktop.
- Deploy and provision
 - Deploy IT-managed virtual XP environment to end users.
 - Enable customization in heterogeneous desktop environments.
 - Automate first-time Virtual PC setup (i.e., initial network setup, computer name, domain join).
 - Adjust Virtual PC memory allocation based on available RAM on host.

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- Application provisioning based on Microsoft Active Directory® users/groups.
 - Assign a virtual image and define which applications are available to the user.
- Redirect web requests that require IE6 to the virtual XP environment.
- Control and Monitor
 - Centrally define usage permissions, and Virtual PC settings.
 - Centrally monitor endpoint clients.
 - Provide helpdesk tools to diagnose and troubleshoot virtual PCs.

Remote Desktop Services

Since Windows NT 4.0, Microsoft has provided a session virtualization solution known as Windows Terminal Services. This solution was extensively improved in successive versions to provide efficiency, security and manageability at scale and has undergone significant enhancements in Windows Server 2008 R2. To reflect the continued focus on enhancing the remote desktop experience, in Windows Server 2008 R2 Microsoft has renamed Terminal Services to Remote Desktop Services (RDS). The change to RDS, however, goes beyond just a name change, as it now supports both session virtualization and VDI technologies as part of the platform.

RDS is a centralized desktop and application deployment platform solution that uses session and desktop virtualization technologies to:

- Increase the speed and flexibility of desktop and application deployments.
- Help improve remote worker efficiency.
- Improve the security of critical data and applications.

RDS accelerates and extends the deployment of desktops and applications to a wide array of client devices, helping make your organization more agile and responsive.

To understand how RDS can add value to your organization, it is useful to understand the functionality it provides in certain scenarios. The following scenarios relate to specific types of employees and factors important to the IT department managing your organization's infrastructure.

Mobile Workers

The RDS solution can help improve mobile employee productivity and increase the effectiveness of user collaboration without compromising security features. RDS offers security-enhanced access to applications or entire desktops over low bandwidth connections without requiring the distribution of new applications to every client. Your employees will see a consistent set of applications and can access their own data regardless of location.

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Task Workers—Factory Floor, Call Center

RDS can provide a more scalable, consistent and reliable experience for structured task workers. These types of employees often only need to access one or a few applications to complete business processes, or sometimes their work environment is not appropriate for PCs (for example, a factory floor).

RDS can provide the same experience even if the client machine is a legacy desktop, a non-PC desktop, or a mobile device. This type of deployment can extend the reach of Windows-based applications within the enterprise and is a valuable way to offer access to applications that employees use infrequently.

Contractors and Offshore Workers

In an environment with complex LOB applications or customized in-house software, RDS can reduce the burden of providing access to these applications to outsourced firms or partners. The client machines can access the applications they require from a central source, rather than requiring local installation of those applications. If needed, the IT department can also limit the access those workers have to specific LOB applications.

Office Workers

Office workers, such as analysts, marketing managers and lawyers, use computers that connect to the corporate network most of the time, and they expect a rich client experience that can handle a broad range of tasks that fall under their responsibility. Many of these users move frequently from one workstation to another and require a free seating environment.

Occasionally, office workers may need to connect to the corporate environment from their home PCs. RDS enables organizations to help these workers achieve high levels of productivity by providing them access to their personalized set of applications and data on their PCs and on different PCs for situations where they need to continue working from a different machine.

The Remote Desktop Connection Broker

The new Remote Desktop Connection Broker, which extends the Session Broker capabilities already found in Windows Server 2008, helps administrators deliver remote resources like desktop and applications to user devices.

If an organization includes structured task workers, the IT department can provide access to a session-based desktop deployed on the server through Remote Desktop Session Hosts. This type of deployment allows access to standard applications in a cost-effective manner and enables users to access LOB applications even from their legacy systems.

The Remote Desktop Connection Broker supports four key deployment scenarios:

- Session-based Remote Desktops

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- Session-based Remote Applications (RemoteApp)
- Virtual machine-based Personal (permanent) Virtual Desktops (VDI)
- Virtual machine-based Pooled (non-permanent) Virtual Desktops (VDI)

Session-Based Remote Desktops

With session-based Remote Desktops, administrators install and manage a complete desktop on centralized servers in the data center; screen images are delivered to the users, and the users' client machines then send keystrokes and mouse movements back to the server the same way they would with a VDI desktop. This deployment benefits task or office workers who require access to an entire desktop that contains less complex applications such as Microsoft Office, ERP/CRM applications or which are not suitable for the client's machine. Typically more users can leverage the same server than a comparable VDI server, with session to VDI ratios in favor of sessions as high as 5:1. This makes session virtualization a much cheaper alternative to Pooled VDI scenarios both in terms of Capital Expenditure and ongoing maintenance for very similar use cases.

Session-Based Remote Applications (RemoteApp)

Like session-based remote desktops, RemoteApp programs are programs that users access remotely on a Remote Desktop Session Host; these programs integrate with the client's desktop, running in its own resizable window with its own entry in the taskbar, and appear as if they are running on the end user's local computer. This feature is valuable when, for example, users need to run custom applications regardless of their client hardware. Local application compatibility problems can be avoided because the application is not installed locally, but executed remotely from an RDS Server. This capability can also be delivered over the Internet to users working at home. RemoteApp Applications can be deployed to physical and virtual desktops.

Virtual Machine-Based Personal Virtual Desktop

The Personal Virtual Desktop uses a dedicated VM that is assigned to a particular user. All user data, like the My Documents folder, and profile information is retained on an image specific to the VM, so the experience is similar to a physical desktop client. This deployment is suitable for knowledge workers, for example people using business analytics software, who require extensive control over their virtual desktop environment.

Existing management tools can also work very well with personal virtual desktops so that VDI becomes just another workload of your existing management tooling, rather than a separate process to manage.

Virtual Machine-Based Pooled Virtual Desktop

Another way of deploying VM-based desktops is through pooled VMs that are identically configured and hosted on one or more Hyper-V servers. Like Session Virtualization, Pooled Virtual Desktops are best suited for office or task workers who need to work on some standard applications and do not require personalized desktop configuration or customization. In this configuration, when a user's session ends their data is not stored on the virtual machine. A typical configuration uses folder redirection to save their data to another server so it is available when they next log on, but no configuration data is saved between sessions. The Pooled Virtual

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Desktop is a more efficient use of VM resources because a set of VMs can support a larger number of users than the Personal Virtual Desktop. Customers find that pooled desktops are typically harder to manage than personal desktops because existing management infrastructure cannot support pooled deployments very well. This means that pooled VDI desktops require a separate management process from existing desktop deployments.

In conclusion, RDS in Windows Server 2008 R2 can provide the following benefits to an organization:

- Achieve more efficient IT administration by storing desktops on servers within the data center. IT has convenient access to those machines, which helps reduce the need to travel to user locations for service requests.
- Reduce the impact of client hardware failure and increase business continuity by storing all desktops and their data in the data center. Even if a computer's hardware fails, or the device is lost, users can remain productive because they can access their applications and data from any client.
- Ensure a higher level of security for intellectual property as data resides in the data center instead of a traditional desktop environment where data resides on local client disks.
- Enhance IT's control over corporate desktops and applications with built-in disaster recovery capabilities that enable administrators to back up and reimage desktops from a master image for all users.
- Increase worker mobility by centralizing desktop workloads and making them available over the network, so workers are no longer restricted to the physical location of their end-user devices.
- Enable a richer end-user experience similar to the interaction with a local desktop and applications.
- Integration with application virtualization to consolidate servers, prevent application conflicts and enable more applications per RDS server.
- Support for both Session Virtualization and VDI instances for the best and lowest cost combination.

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Managing Desktop Virtualization

As organizations incorporate desktop virtualization into their IT infrastructures, they have access to new capabilities that can reduce TCO, increase business agility and continuity, enable anywhere access, and improve security and compliance. To fully benefit from these new capabilities, organizations require management tools and monitoring software that fully integrates with virtualization capabilities. With System Center, organizations gain the ability to fully integrate both desktop and server virtualization as a core capability in a dynamic, self-managing IT infrastructure.

System Center includes the ability to monitor and manage all Microsoft desktop virtualization technologies, server and desktop applications, as well as hardware, hypervisor, and operating systems software. Without monitoring software that has visibility into the entire IT infrastructure from the hardware to the application levels, organizations are lacking a crucial tool for infrastructure management. In environments that use virtualization, this shortcoming is exacerbated. Because desktop and server virtualization often increases complexity, effective management of a virtualized environment demands a single tool that can show cause-effect relationships between physical hosts, virtual machines, and applications. Microsoft System Center is the only monitoring tool available that provides this level of comprehensive monitoring.

If an organization uses desktop virtualization in its IT infrastructure, the monitoring and management software must effectively administer all parts of the IT services infrastructure, including the desktop virtualization components. As monitoring information gathered from multiple sources becomes more integrated and consolidated, IT staff become more effective in their ability to respond to desktop problems quickly and help maximize desktop user efficiency. This increased management effectiveness drives TCO down. Microsoft System Center is the only comprehensive monitoring and management software that effectively includes all parts of the IT services infrastructure, whether desktop virtualization is used or not.

The Microsoft VDI Suites

The Microsoft VDI Standard Suite and Microsoft VDI Premium Suite volume licenses provide excellent value for customers, by making it simple to purchase comprehensive Microsoft VDI infrastructure and management software. The VDI Standard Suite includes a complete VDI offering,

The Microsoft VDI Standard Suite includes the following features:

Desktop Delivery:

- Basic connection broker to deliver personalized and pooled virtual machine-based desktops in low-complexity environments.
- Web-based remote access and full-fidelity end user experience.

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Application Delivery:

- Separation of application layer from image with app streaming.
- Reduces app-to-app conflicts and need for regression testing.
- Easy application life cycle management via policies.

Virtualization Platform:

- Reliable hypervisor with small footprint.
- Supports live migration.

Management:

- Integrated, end-to-end management.
- Dynamic provisioning of apps to physical, virtual and session-based desktops.
- Rapid VM provisioning with cloned VHD's.
- Support for failover clustering and storage migration.
- Patching, updating, and monitoring of physical VDI host.

The Microsoft VDI Premium Suite includes the features of the VDI Standard Suite plus the full capabilities of Windows Server Remote Desktop Services to provide greater flexibility for desktop and application delivery. Additional features include:

Desktop Delivery:

- Single brokering, discovery and publishing infrastructure for VDI, and session-based desktops and applications.
- Higher user density with session-based desktops than with virtual desktops.

Application Delivery:

- Separation of hosted applications from the image.
- Isolation of incompatible applications and consolidation of Remote Desktop Session Host server silos.

Microsoft continues to partner with Citrix and Quest to provide enterprise VDI functionality at a very competitive price, such as a rich remote user experience, integrated management of physical and virtual desktop environments, single image management and storage optimization.

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VMWare's Desktop Virtualization

VMware's claims to offer a broad suite of desktop virtualization products including VMware View, VMware ThinApp, and VMware Ace among others. It's important to realize, however, that while these technologies do provide different capabilities, they all rely on a VDI-based foundation which is inherently limited. Because VDI requires uninterrupted network connectivity, for example, remote or mobile users suffer in a VDI centric environment. There are other user scenarios that are also not fully served in the pure VDI model that VMware advocates. Consequently, administrators are left with facing providing less-than-ideal workarounds or simply offering limited functionality to configurations that VDI is not designed to handle gracefully.

VMWare View

VMware's View product functions as a centralized VDI management tool which allows administrators to create server hosted virtual desktops and manage policies to regulate how virtual desktops are deployed and used. As part of this solution, VMware recommends the use of a technology known as Linked Clone to create desktop images from a master image. This technology is intended to create some efficiency by allowing IT staff to update and patch the master image, and have the changes automatically apply to the linked desktop clones. Linked Clones are managed independently of other desktop management and update software, which creates additional management work.

View prefers the use of a remote desktop display protocol known as PCoIP, though View can also use Microsoft's Remote Desktop Protocol (RDP). PCoIP has support for multiple monitors and rich media content delivery, as well as access to local peripherals like scanners and mass storage. PCoIP is a new protocol that VMware has licensed from Teradici in an effort to improve the desktop experience.

As of the time of writing, View does not support Windows 7 as a guest operating system, but does have beta support for Windows 7 as a virtualized desktop operating system. View can be used with thin client devices. View also offers a beta feature that allows users to download a virtual desktop onto a client device for disconnected state operation.

VMware ThinApp

VMware ThinApp isolates applications from the underlying operating system. ThinApp is designed to reduce application conflicts and simplify application delivery. Instead of using a client agent, ThinApp embeds its agent into every software application it virtualizes. While this gives the impression that an agent is not required, the agent is actually duplicated in every virtual application delivered to the end point. Organizations may view this as a benefit because there is no service installation, however, this approach reduces the control available to IT staff and makes it more difficult effectively manage applications across their enterprise. For example, any user can take any ThinApp application and use it anywhere. Flexibility without management will ultimately drive up IT costs, minimizing the benefits provided by application virtualization. ThinApp does not provide any management of its applications. Instead, it is dependent on 3rd party management systems. In

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order to capture any information related to a ThinApp virtual application, customers must create customized scripts and write to the Windows Management Interface for every application. VMware provides little to no guidance on how to effectively integrate into existing management systems, which leaves the learning and associated costs to the customer.

ThinApp streams the application to the client computer as needed over the Server Message Block protocol only, and the application runs in user mode on the client computer. Updates to the virtual application are streamed over HTTP, forcing customers to configure separate delivery protocols. Because ThinApp uses no client agent, it has no footprint on the client device. This means that ThinApp is unable to use caching to support offline access to virtualized applications. This also means that if the streaming server is not available, the user is unable to launch the application. Instead the entire application must be copied to every single device, which defeats the benefits of application streaming.

ThinApp does provide any management infrastructure in the box. It relies on a file server or Web server for the basic streaming capabilities it provides. All ThinApp management is done using command line or by editing XML files on a per package basis. There is no administrator console to help IT staff understand what applications have been delivered, to where or to whom. This makes version control, compliance and licensing very difficult to manage. ThinApp relies on an existing software deliver system to handle inventory, configuration management, and delivery of virtualized applications. VMware passes the ThinApp management costs onto the customer, which is a non-trivial and costly task for most organizations.

VMware ACE

VMware ACE provides users with standalone virtual machines that can be centrally managed by IT staff. ACE is used to simplify application backwards compatibility and provide users with a standardized desktop environment complete with applications. ACE supports Windows 7 as a guest operating system. The ACE 2 Management Server can be used to manage and control ACE clients from a central location. ACE 2 Management Server also uses policies to regulate user access to ACE clients, ACE client access to other computers on the network, and ACE interaction with client peripherals and hardware.

VMware Workstation and Player

VMware Workstation provides operating system virtualization for desktop users. Workstation is compatible with a range of guest operating systems and uses snapshot and clone technology to allow users to roll VMs back to a previous point in time or easily duplicate VMs. VMware customers often use Workstation to facilitate testing or development scenarios. VMware Player is a free, functionality-reduced version of VMware Workstation.

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Conclusion

Customers who choose Microsoft's desktop virtualization solution will gain access to the most flexible, effective products for meeting their desktop management challenges. While other vendors like VMware provide a virtualization-centric product line that may be a good fit for some desktop management challenges, Microsoft provides a multi-tiered solution that helps customers create a great fit between their particular challenges and the solution.

The entire Microsoft desktop virtualization solution is managed and monitored by System Center. System Center management provides comprehensive management so that organizations can efficiently manage all the components of their desktop virtualization solution in conjunction with the other parts of their infrastructure. This comprehensive management capability is a vital part of realizing maximum TCO reductions from a desktop virtualization solution.

MDOP helps customers better manage their Windows desktops, even if they choose not to implement any desktop virtualization components. Customers who want to address their application compatibility and maintenance challenges can do so with MDOP's MED-V and App-V components. Customers who require centralized manageability for applications can choose between RDS and VDI solutions. And customers who face all of these challenges can implement the entire Microsoft desktop virtualization solution with a single software license that includes all the solution components.