



Desktop Virtualization Strategy

Choosing the right solution for your needs

ABSTRACT

Several forms of desktop virtualization can help organizations satisfy users' needs for mobility and flexibility, while relieving pressure on information technology (IT) departments to manage cost, security, and compliance. Additionally, desktop virtualization can enable more dynamic centralized management by separating the elements of the traditional desktop computing stack. This white paper describes how to create a virtualization strategy that achieves these goals and introduces comprehensive desktop-virtualization solutions from Microsoft. Finally, it provides high-level guidance to help companies develop a desktop-virtualization strategy.

Evolving Needs of Users and IT Departments

Today's computing environment requires IT departments to address more PC management challenges than they did just a few years ago. Users are increasingly demanding access to their applications and data anywhere and from any device. The rapid growth of knowledge workers who roam from one PC to another within the office had led companies to provide access to the users' desktop experience at any computer in the workplace, effectively detaching the user from the physical PC.

Additional challenges stem from users' shifting views of technology in the workspace. At home, they are increasingly savvy about technology, and they expect similar personal configurations and freedoms in the workplace. Users are now more likely to use their own devices to access corporate applications, such as accessing corporate email from their personal mobile phones.

While these trends are making employees more productive, they are causing new challenges for IT departments. New form factors, network dispersion, and increased mobility result in more complexity

and higher pressures on cost control. The cost of deploying a traditional PC ranges from \$160 to \$350 and managing each PC costs another \$200 to \$1,300 per year¹. Furthermore, lost or stolen laptops are more common, and securing laptop and desktop PCs can require significant resources. Data loss is not an option today and such damage can be immeasurable. Finally, compliance regulations (e.g., Sarbanes-Oxley, HIPAA) have strict requirements for protecting privacy and corporate data as well as public disclosure when issues arise. Failure to protect this data can lead to significant punitive consequences and a negative impact to the organization's reputation.

Organizations are also looking for ways to help protect the environment, including looking for ways to effectively re-use older PCs instead of sending them to the landfill.

The question then is, "How can IT fulfill users' needs while managing complexity and cost with better efficiency, faster responsiveness, and additional business value or competitive edge?"



¹ IDC, Optimizing Infrastructure, 2006

The Promise of Desktop Virtualization

Companies are increasingly turning to virtualization as the answer to their desktop challenges. Desktop virtualization is the act of decoupling the different computing layers and storing some or all of them in a data center (see figure below).

Through virtualization, employees can access their applications and data very safely over a network and the risk of data loss is minimized. On the IT side, virtualization accelerates deployment of new capabilities without needing to acquire new hardware and configure components. It also reduces application testing requirements and compatibility issues and simplifies disaster recovery and compliance.

Over the past few years, businesses have simplified their data center management via server virtualization technologies and reaped enormous cost benefits in the process. Now, new advances in virtualization and more ubiquitous availability of broadband access enable

companies to do the same with enterprise desktops by providing the tools necessary to rearrange how PC components interact and to choose where those components reside.

Developing a Desktop Virtualization Strategy

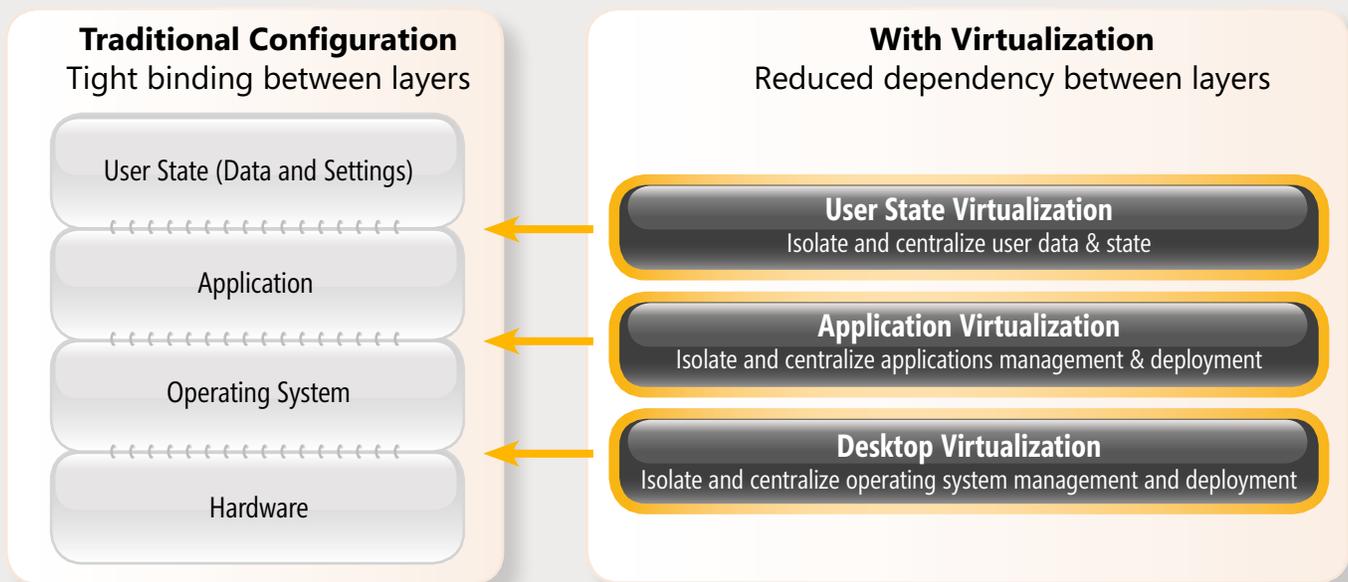
There are many desktop virtualization options and possible combinations and therefore the development of a desktop virtualization strategy requires three distinct steps:

1. Map the available technologies
2. Define user needs
3. Match technologies with user needs.

The next sections provide more detail and guidance on these steps.

What is Virtualization?

Virtualization is the act of decoupling one computing resource from others without impacting the usability across these resources. Rather than locking the various layers together—the operating system (OS) to the hardware, the application to the OS, and the user interface and data to the local machine – virtualization technologies loosen the direct reliance these parts have on each other.



Desktop Virtualization Strategy Steps:

1 - Mapping the Technologies

Given the many layers of the computer stack and multiple desktop virtualization options, it is useful to separate the technologies into two groups (see figure below):

Essential: These are the first steps that the IT department should consider given their relatively easier deployment and possibility of obtaining significant benefits in the short term with limited investments.

- **User state virtualization.** The first and simplest virtualization strategy is to deploy user state virtualization, which separates the user data and settings from any PC and enables IT to store them centrally (i.e., in the datacenter) while also making them accessible on any PC. It also simplifies the central backup of user data since data is already stored centrally on servers.
- **Application virtualization.** This technology isolates applications from each other and solves application to application compatibility issues by allowing applications to run together even though they may require the same resources from the OS. It also reduces the application testing and deployment effort because IT no longer needs to test how different groups of applications work together every time one of the apps is patched or upgraded. Moreover, application virtualization allows IT to store the application centrally and stream the application to a desktop based on user access. It further completely removes the applications from the desktop footprint and allows IT to deploy a smaller master image across variety of business groups.

In many cases customers will choose to deploy some applications locally on the PC and some applications remotely using Terminal Services. Application virtualization can be used in conjunction with the deploy technologies available for both of these scenarios.

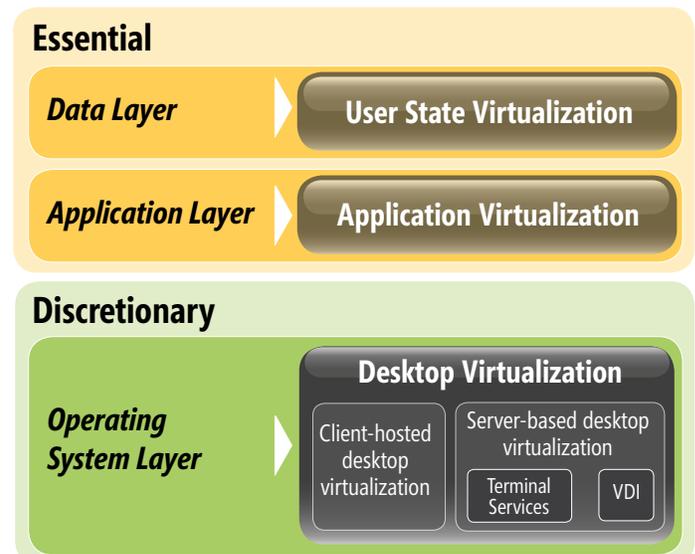
Discretionary: These powerful technologies allow for significant flexibility and efficiency but also require more sophisticated technical skills and a larger investment of IT resources. These optional technologies include:

- **Client-Hosted Desktop Virtualization.** Client hosted desktop virtualization is a type of machine virtualization technology (such as Microsoft® Virtual PC) that separates the operating system from the physical hardware and allows a single PC to run virtual machines side by side with the host OS. Typically, companies will require

enterprise management solution such as Microsoft Enterprise Desktop Virtualization (MEDV) to enhance deployment and management of Virtual PC images on a Windows® Desktop, while also providing a seamless and simple experience for the end-users, independent of the local desktop configuration and operating system.

- **Server-Based Desktop Virtualization:** Server based desktop virtualization solutions allow the execution of an environment at one place and presentation of that environment or user interface at a different location. These technologies usually use remote desktop protocols, such as RDP, to decouple the user interface location from the execution environment location. Remote execution enables organizations to use older PCs as “thin clients,” giving users the benefit of newer applications and versions of Windows while helping save the environment by avoiding the dumping of electronics into landfills. Server-based desktop virtualization technologies include:
 - **Microsoft Terminal Services Remote Desktops.** Remote desktops use session virtualization to partition a single OS into multiple user sessions in a cost effective manner.
 - **Virtualized Desktop Infrastructure (VDI).** VDI leverages machine virtualization technologies to allow a single server to run many virtual machines. With VDI, organizations can run multiple desktops, each in a virtual machine, on the same server in a datacenter and use remote desktop protocols to allow a user to access the desktop outside the data center.

Desktop Virtualization Technologies

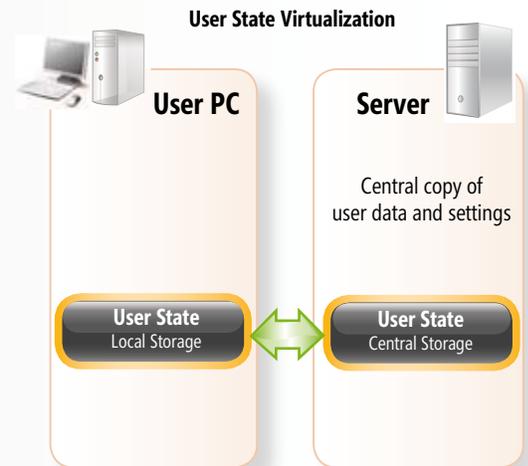


Essential Desktop Virtualization Solutions

User State Virtualization

The *user state* includes users' data as well as application or operating system configuration settings. Traditionally, users' PCs contain the authoritative copy of users' data and settings. There are three main challenges with managing the user state.

- The first challenge is how to back up user data and settings that are scattered from PC to PC and then restore users' productivity after a laptop is lost or stolen.
- The second challenge is how to migrate the user state during operating system migrations.
- The final challenge is how to make the data available to the user regardless of the PC being used. In any case, user state virtualization provides a solution.



With user state virtualization, organizations store users' data and settings in a central location (and, optionally, cache them locally for offline usage when users are mobile). The result is that users are free to roam, and their data and settings follow them. User state virtualization can also mitigate productivity loss of PC replacement. The central copy of the data is on the network, so it is easily restored in case of a lost or stolen PC and the user's settings can be re-applied automatically. When IT sets up the policy to allow offline access to the redirected folder, Windows® BitLocker™ Full Volume Encryption should be applied to the PC to help ensure data safety. A typical example of this type of virtualization is using Windows with Windows Vista Folder Redirection with Offline Files and a Roaming User Profile.

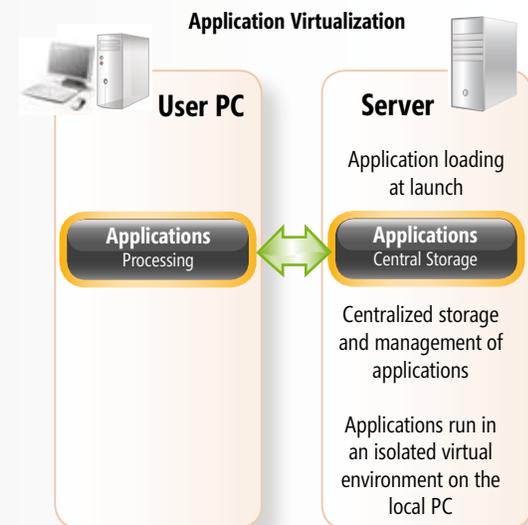


Folder Redirection, Offline Files, and Roaming User Profile

Folder Redirection and Offline Files are Windows® features that enable IT staff to redirect users' data and settings to a central network location. See the last section for details.

Application Virtualization

With application virtualization, organizations can store and manage applications centrally, integrate with third party PC lifecycle management and software distribution systems, or deploy using standalone media. Businesses deliver applications on demand and then these applications then cache and run locally. Application virtualization isolates applications from one another, thus reducing application-to-application conflicts. The application's footprint on the PC is reduced because the application is cached and not physically installed on the PC. Application virtualization also enhances organizations' ability to control access to applications, track usage of virtual applications, and quickly test, deploy, update and remove applications. Application virtualization simplifies the application lifecycle from test, deployment, and management all the way through to end of life.



Microsoft Application Virtualization transforms applications into centrally-managed virtual services that are never installed and don't conflict with other applications. See the last section for details.

Discretionary Desktop Virtualization Solutions

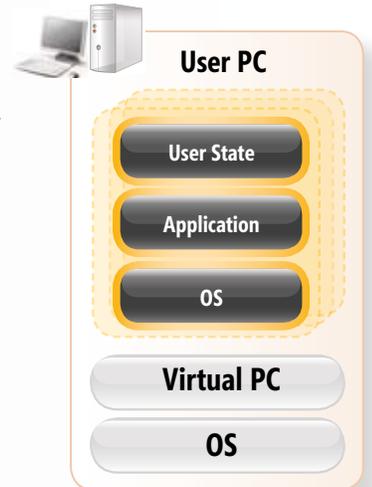
Client Hosted Desktop Virtualization

With desktop (machine) virtualization, multiple client operating systems can run on the same hardware at the same time where each operating system is running in its own virtual machine.

Client-hosted desktop virtualization offers the following benefits:

- Minimizes application-to-OS compatibility issues and accelerates OS migrations.
- Streamlines delivery and reconstitution of corporate desktops, simplifying support tasks, business continuity, and incorporation of heterogeneous IT environments.
- Support offline users and roaming users.
- Increases enterprise IT staff control over corporate laptops while providing users the flexibility needed to maximize productivity.

Client-Hosted Desktop Virtualization



Some client-hosted desktop virtualization technologies (ex: MEDV) support two modes of operation: full desktop mode, where users are presented with the full desktop running inside the virtual machine and a seamless integration mode that integrates the applications that are running inside the virtual machine environment with the host native desktop. An emerging twist on client-hosted VMs is the decoupling of the VM from the PC, making the VM portable. For example, organizations can distribute VMs on USB flash disks (UFDs). When users plug these UFDs into a PC, the VM starts, and users can log on to their virtual desktops. Just recently, Microsoft announced the intent to support such scenarios with MEDV and Windows license called Windows Vista® Enterprise Centralized Desktop (VECD).

Microsoft®
Enterprise Desktop Virtualization

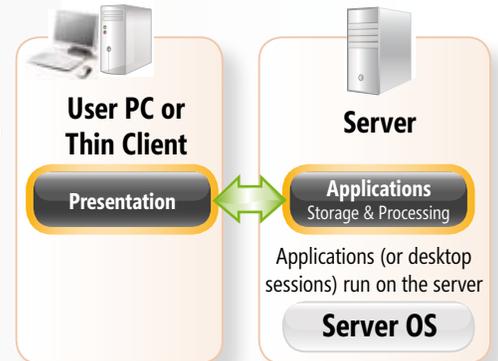
Microsoft Enterprise Desktop Virtualization (MEDV) enhances deployment and management of VMs on rich clients, providing a seamless user experience independent of the local desktop configuration and operating system. See the last section for details.

1. Server Based Application Deployment - Microsoft Terminal Services

Microsoft Windows Server® Terminal Services is a mature, server-based computing architecture that runs user applications on a single Windows Server operating system with multiple sessions on one server, enabling each user to remotely access a full desktop or single application from the user's local device via a remote protocol such as Microsoft Remote Desktop Protocol (RDP). Two general types of presentation virtualization exist:

- **Terminal Services Remote Desktop** provides each user with a complete desktop and applications that are running on the Terminal Server. This shared architecture provides centralized management and efficiency. Each server is running one operating system and thus can support many multiple users. On the other hand, this solution does not give users the flexibility to customize their environments in the ways that they can customize traditional PCs. Also, some applications do not run well on a multiple-session server operating system, and might cause some application compatibility issues.

Presentation Virtualization



2. Server Based Desktop Deployment - Microsoft Terminal Services

- **Terminal Services Remote App** suppresses the desktop and presents only the UI of the applications onto a local PC, while the applications themselves are running on a server. This solution allows the user to access remote apps as if they are running locally and thus eliminates the second desktop that uses training requirements. Application presentation virtualization has similar advantages and disadvantages to desktop presentation virtualization. It has the economic benefits of a shared-computing architecture, but it usually requires applications to run on a server operating system, which some application vendors do not support.

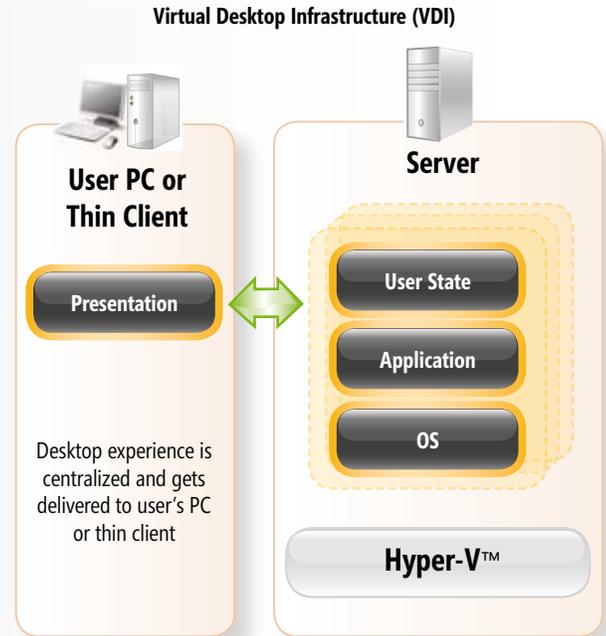
Microsoft
Terminal Services

Microsoft Terminal Services virtualizes the presentation of entire desktops or specific applications, enabling customers to consolidate applications and data in the datacenter while providing broad access to local and remote users. See the last section for details.

Server Based Desktop Virtualization - Virtual Desktop Infrastructure (VDI)

VDI is an alternative server-based desktop virtualization method, that extends the concept of server consolidation via virtualization to central management of client desktops. In VDI, multiple client operating systems are running in VMs on a server that remotely presents each desktop to a client device. VDI allows central management and deployment of user desktops while providing each user the capability to customize a unique desktop with admin rights if necessary (for developers, as an example). There are various ways to architect VDI, but in general there are two deployment models:

- Static Deployment:** In the static or persistent model, each VM is like a traditional PC, where user data, settings, applications and the operating systems are all mingled together, and each user has his or her unique VM. So, if there are 100 users, there will be 100 VM images. This deployment model utilizes both the presentation virtualization and machine (server) virtualization.
- Dynamic Deployment:** In the dynamic model, each VM is created when a user logs in. Based on the setup in the Access Directory and Group Policy, a copy of VM with OS is selected, created and placed on a server, specific application access is granted onto that VM, the user's settings are deployed and the user's data are attached. When the user logs off, the data and settings are saved, the VM copy is either destroyed or returned to a pristine state for future use. In such a model, the number of VM images is greatly reduced, where one image can potentially support all users. This model may also be known as the "pooled" or "temporary" VM model. This deployment model utilizes user setting virtualization and application virtualization, in addition to presentation and machine (server) virtualization.



Virtual Machine Manager is a comprehensive management solution for the virtualized datacenter. See the last section for details.



Microsoft Hyper-V Server, is the next-generation server virtualization technology. See the last section for details.



Windows Vista Enterprise Centralized Desktop (Windows VECD) is a unique Windows Vista licensing option for VDI. Windows VECD allows organizations to install Windows operating systems on an unlimited number of VMs on server and storage devices. See the last section for details.

Desktop Virtualization Strategy Steps: 2 - Define User Needs

The second step in defining a desktop virtualization strategy is to identify user needs and scenarios that might benefit from a particular virtualization technology. To simplify this process, Microsoft has identified five Windows Optimized Desktop Scenarios. Each usage scenario has its unique User and IT requirements.

User Scenario	Examples	User Requirements	IT Requirements
 Mobile Workers	Sales professionals, consultants, accountants	<ul style="list-style-type: none"> • Access to data and applications anywhere, anytime • Offline computing • Easy migration 	<ul style="list-style-type: none"> • Data protection & compliance • Replaceable PC in case of lost or stolen laptop • Full, rich desktop environment
 Office Knowledge Workers	Analysts, architects, designers, doctors	<ul style="list-style-type: none"> • Rich user experience with multiple applications running locally • Access to centralized line of business applications • Access to same experience at any PC across the organization 	<ul style="list-style-type: none"> • Data protection and compliance • Flexibility to move users from one PC to another across the organization
 Task Workers	Call center employees, warehouse workers, retail employees	<ul style="list-style-type: none"> • Task-based user experience and controlled environment • Access to centralized line of business applications from any PC in the workplace • No requirements to save data locally 	<ul style="list-style-type: none"> • Lower TCO through extended hardware life and sharing of physical PC • Centralized management of configurations • Highly-controlled Controlled environment
 Contractors and Offshore Workers	Offshore developers, offshore customer support personnel	<ul style="list-style-type: none"> • Remote access with full desktop experience 	<ul style="list-style-type: none"> • Standard corporate image on a non-corporate PC • Data protection and compliance
 Work from Home	Occasional access to applications and data from home	<ul style="list-style-type: none"> • Remote access with full desktop experience when not at work 	<ul style="list-style-type: none"> • Standard corporate image or applications on a user's home PC • Data protection and compliance

Desktop Virtualization Strategy Steps: 3 - Match technologies to User Needs

The following table provides guidance in deciding which desktop virtualization solution is most appropriate for each scenario.

	Optimized desktop scenarios	Key Microsoft Technologies
 <p>Mobile Workers</p>	<p>Replaceable PC <i>Flexibility, easy to migrate users</i></p> <p>With Application Virtualization and Folder Redirection, Offline Files, and Roaming User Profiles, customers can enable the “Replaceable PC” scenario for mobile uses – providing flexibility of user settings; ease of user migration and a high level of protection of the local data. Microsoft Enterprise Desktop Virtualization provides seamless access to an application running within a local virtual machine to resolve compatibility issues.</p> <p>BitLocker Full Volume Encryption is used to help maintain data protection in case the mobile PC is lost or stolen.</p>	<p>Application Virtualization</p> <p>MEDV</p> <p>Folder Redirection, Client Side Caching, and Roaming User Profile</p>
 <p>Office Knowledge Workers</p>	<p>Hot-desking <i>Flexibility, compliance, free seating</i></p> <p>With Application Virtualization and Folder Redirection, Offline Files, and Roaming User Profiles, as well as Terminal Services for the critical LOB application, customers can enable the “Hot desking” scenario – providing free seating (applications and data follow user) and addressing compliance needs. Microsoft Enterprise Desktop Virtualization provides seamless access to an application running within a local virtual machine to resolve compatibility issues.</p>	<p>Application Virtualization</p> <p>Terminal Services Remote App</p> <p>Folder Redirection</p> <p>MEDV</p>
 <p>Task Workers</p>	<p>Extending PC life <i>Security, low cost</i></p> <p>Presentation virtualization (Terminal Services) and Windows Fundamentals for Legacy PCs allow task workers to access applications executed on the server, so the confidential data never leaves the data center, improving compliance and limiting risk of data theft and extending the life of older PCs, saving them from landfills and helping the environment.</p>	<p>Terminal Services Remote Desktop</p>
 <p>Contractors and Offshore Workers</p>	<p>Hosted Image <i>Security, right apps and data</i></p> <p>Using Virtual Desktop Infrastructure Windows Server Hyper-V 2008 and Windows Fundamentals for Legacy PCs (WinFLP), contract workers can have controlled access to specific applications using legacy PCs while keeping the applications and data stored only on central servers, saving them from landfills and helping the environment.</p>	<p>Windows Vista Enterprise Centralized Desktop</p> <p>Microsoft VDI</p> <ul style="list-style-type: none"> - Windows Server 2008 w/ Hyper-V - System Center Virtual Machine Manager
 <p>Work from Home</p>	<p>Working from Home PC <i>Security, emergency access</i></p> <p>With Windows Server Hyper-V 2008, administrators can enable office workers to access their desktop, applications, and data via Windows Vista Enterprise Centralized Desktop (VECD) and a remotely accessible dedicated Windows Vista virtual machine, from their home PC.</p>	<p>Windows Vista Enterprise Centralized Desktop</p> <p>Microsoft VDI</p> <ul style="list-style-type: none"> - Windows Server 2008 w/ Hyper-V - System Center Virtual Machine Manager

Evaluating Microsoft® Comprehensive Solutions

Microsoft has the most comprehensive family of solutions for desktop virtualization and management and provides flexible licensing designed to simplify adoption of these technologies. Microsoft virtualization products and technologies are already helping companies automatically match computing capabilities to user and IT needs. The following table describes how Microsoft technologies can help to implement your organization’s virtualization strategy.

Virtualization Solution	Microsoft Product	Description	Licensing
User State Virtualization	Windows Vista®: Folder Redirection, Offline Files, Roaming User Profiles	Folder Redirection and Offline Files are Windows features that enable IT to redirect users’ data and settings to a central network location.	Built in to Windows
Application Virtualization	Microsoft Application Virtualization	Application Virtualization eliminates application to application conflicts allowing them to co-exist side by side - no matter which other application are installed and running on that device. The infrastructure streams applications on demand and they run on any licensed machine, including virtual machines. Virtualized applications are also available in offline mode.	Microsoft Desktop Optimization Pack
Desktop Virtualization	Microsoft Enterprise Desktop Virtualization (MEDV)	MEDV enhances deployment and management of VMs on rich clients, providing a seamless user experience independent of the local desktop configuration and operating system. MEDV helps to mitigate application to operating system compatibility issues by enabling organizations to run multiple operating systems on the desktop PC.	Microsoft Desktop Optimization Pack
Presentation Virtualization	Windows Server Terminal Services	Terminal Services virtualizes the presentation of entire desktops or specific applications, enabling organizations to consolidate applications and data in the datacenter while providing broad access to local and remote users.	Terminal Services Client Access Licenses (CALs)
VDI	Microsoft System Center Virtual Machine Manager, Windows Server Hyper-V	<p>VDI from Microsoft is a carefully-matched combination of Virtualization Technology and Licensing. Together, they make possible a host of benefits to your company, including the centralization of data, enhanced security, and increased business continuity. On the technology side, the core components of Microsoft’s offering for VDI are:</p> <ul style="list-style-type: none"> • Windows Vista Enterprise Centralized Desktop — the foundation on which all user applications run on Virtual Machines. • Windows Server 2008® with Hyper-V™ <ul style="list-style-type: none"> • Windows Server 2008 — the most advanced Windows Server operating system ever offered by Microsoft. • Hyper-V — the next-generation hypervisorbased server virtualization technology from Microsoft. • System Center Management Suite with Virtual Machine Manager (or VMM) — simplifies the deployment, provisioning, and management of virtual servers. • Microsoft Application Virtualization (formerly SoftGrid) — delivers applications that are never installed, and are dynamically delivered on demand. • Microsoft Terminal Services — virtualizes the presentation of entire desktops or specific applications. <p>Virtual Machine Manager is a comprehensive management solution for the virtualized datacenter. The solution enables increased physical server utilization, rapid provisioning, and centralized management of VM infrastructures. Windows Server Hyper-V, the next-generation hypervisor-based server-virtualization technology, allows organizations to make the best use of their server hardware investments by consolidating multiple server roles as separate VMs running on a single physical machine.</p>	<p>Windows Vista Enterprise Centralized Desktop (Windows VECD)</p> <p>Microsoft System Center Virtual Machine Manager</p> <p>Microsoft Hyper-V Server 2008</p>

Microsoft's Flexible Licensing Options

Microsoft Software Assurance

The key technologies that enable desktop virtualization are available through Software Assurance (SA). SA provides great value for all Microsoft products. In addition to upgrade rights to the next version, SA provides unique technologies designed to help organizations optimize their desktop infrastructures by simplifying deployment and management and improving security, while providing the best user experience.

Microsoft Desktop Optimization Pack (MDOP)

With SA, organizations have access to the Microsoft Desktop Optimization Pack (MDOP), a suite of best-of-breed desktop management technologies—such as Microsoft Application Virtualization. These applications work together to help organizations manage their desktop environment, lower TCO and be more responsive to users by providing anywhere, anytime access to the OS and Applications.

MDOP is an additional subscription available to SA customers that gives rights to any new MDOP technologies that are released.

Windows Vista Enterprise

Next, through SA, organizations get access to special releases of Windows designed for enterprise requirements, including Windows Vista Enterprise and Windows Fundamentals for Legacy PCs.

Windows Vista Enterprise offers additional capabilities above and beyond Windows Vista Business to provide a higher level of data protection, with Windows BitLocker™ Drive Encryption, and easier desktop management with Multilingual User Interface Packs and rights to run up to 4 additional copies of Windows in a virtual machine.

Windows Fundamentals for Legacy PCs is a small-footprint Windows-based operating system solution designed for customers who have legacy computers running early operating systems and are not in a position to purchase new hardware.

Windows VECD

Windows Vista Enterprise Centralized Desktop (VECD) provides unique licensing to run Windows in virtual machines (VMs) on servers. Users are able to access these VMs on either PCs or thin clients. Windows VECD supports hosted desktop architectures, also known as centralized desktop or virtual desktop infrastructures (VDI), and provides customers the flexibility to explore this particular model of desktop deployment.

Benefits and features of Windows VECD

- Unlimited installs of Windows Vista Enterprise (or downgraded Windows operating system) on the server
- Licensed by access device (PC or thin client)
- Four running virtual instances per access device for a user at a time
- Ability to run both static and dynamic hosted desktop architectures

Microsoft
Software Assurance
for Volume Licensing

Microsoft
Desktop Optimization Pack
for Software Assurance

 **Windows Vista**
Enterprise

 **Windows Vista**
Enterprise
Centralized Desktop

 **Windows Fundamentals**
for Legacy PCs

Appendix: Additional virtualization concepts

To fully understand client virtualization, two more concepts need to be introduced:

1. Where the software is executed; local or remote
2. How it is presented or delivered to the user

These two concepts, illustrated in the figure below, are important given that they will greatly impact the hardware requirements in the infrastructure and the fulfillment of various user requirements.

Local Execution vs. Central Execution

In local execution, the software instructions are performed locally on the client device, such as Microsoft Office running on a traditional PC and storing documents locally on a PC hard-drive. In central execution, the software instructions are performed remotely, such as in a data center on a server, and not on the user's local device. Central execution also requires network connectivity from the client device to the computing device in order for the user to provide input and receive the output.

Typically, technologies utilizing local execution can provide richer user features and better performance on graphic and audio compute intensive software, while central execution can provide a higher level of security by having the software contained within walls of the datacenter.

Software Deployment and Presentation Virtualization

All virtualization technologies not only virtualize the software layer but also provide the delivery to the user-facing client device. For example, Microsoft application virtualization not only virtualize the application layer but also stream the apps to a central or virtual desktop. We typically do not separate the virtualization technology from its delivery mechanism.

This changes, with new innovations in remote presentation technologies, where virtualization technologies in the OS

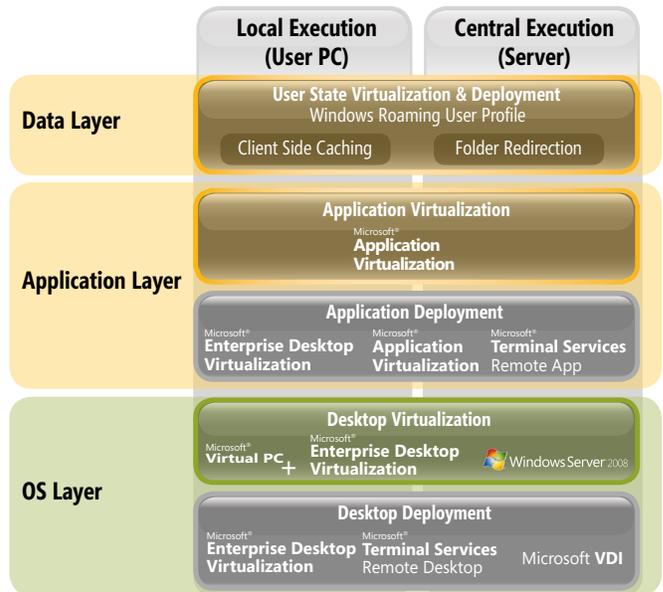
layer can hide the background of one desktop and publish the apps of that desktop to a 2nd desktop.

For example, utilizing MEDV, a user can be run both Windows Vista and Windows XP on the same laptop. The applications running on Windows XP can be published onto Windows Vista "START" menu, and its icons shows up on the Windows Vista Desktop. When the user click on the app icon, the app opens as if it is running on Windows Vista natively.

This same capability is also available in Microsoft Terminal Services, where a session of Windows Server is delivered to a user PC and the applications running on the server can be published onto the user's "Start" menu even though it is actually running on a server in a data center and the UI is displayed via Microsoft Remote Desktop Protocol (RDP)

Detailed map of virtualization solutions

The figure below considers these two new concepts and provides a more complete picture of the virtualization options available to IT managers.



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