

HP Virtual Desktop Infrastructure with VMware View

Bring the benefits of industry-standard servers to your desktop environment.



Are you meeting your desktop management challenges?

If you're part of an IT organization that serves hundreds or thousands of employees, the desktop environment creates huge challenges. For starters, there's the cost of ownership. While most desktop devices are inexpensive to buy, they are costly to own. Gartner estimates that an end-user desktop might cost you up to \$5,386 per user per year to own and operate.¹

What's driving up the costs? For one, you have the labor-intensive desktop management and technical support. Too often, valuable system administrators end up spending time on routine tasks like password resets. Management time is also lost to the inefficiencies associated with vulnerability and patch management for a mix of PC images. When you have products from multiple PC vendors, multiple models from the same vendor, and a variety of different access devices, you face expensive support and a range of refresh cycles.

Then there are the formidable security and data protection issues. It's hard to protect hundreds or thousands of client devices and the sensitive information on them. From data backup to virus containment, device theft to hacking attempts, the end user is the focus of much of today's data loss. Leaving end users as administrators is a risky proposition. In some cases, end users can install unlicensed software, creating both audit and security risks.

Finally, you have significant power and cooling costs that come with each PC. Given issues like these, at times you might have thought, "There must be a better way

to run a desktop environment." Now there is. It's called HP Virtual Desktop Infrastructure (VDI) with VMware View. This solution provides a centralized approach to managing your desktop environment and protecting the information within it. It brings the far-reaching benefits of industry-standard servers and shared storage to your desktop environment, while delivering a full virtual PC experience.

Move ahead with HP Virtual Desktop Infrastructure.

HP Virtual Desktop Infrastructure with VMware View allows your organization to consolidate many physical desktops onto a single server or a cluster of servers with shared storage. You can then centrally host and manage your desktop environment from within your data center or another robust and reliable location with advanced security features.

With your desktop virtualization solution in place, you can increase resource utilization and enhance the security, availability, and protection of the data you now hold on client systems. HP VDI with VMware View also helps you increase the manageability, efficiency, and reliability of your desktop environment. These are just some of the benefits you can realize when you bring server-class hardware, VMware virtualization software, and shared storage to your desktop environment.

Many organizations, from midsize companies to large enterprises, have put VMware virtualization to work to increase resource utilization, consolidate systems, and enhance business agility. Drawing on these successes, organizations are now turning to desktop virtualization to enable the same types of efficiencies gained with server virtualization.



What goes into HP VDI? Here are the key solution components.

HP simplifies desktop virtualization by bringing together all the components you need for an end-to-end desktop virtualization solution. The HP VDI solution is composed of several hardware and software building blocks—including servers, storage, VMware virtualization software, management tools, and access devices—along with professional services to design, integrate, deploy, and support your solution.

Specific solution components include:

HP ProLiant and BladeSystem servers

The high-availability design of HP ProLiant and HP BladeSystem servers means virtual desktops use the server's hot-plug redundant power supplies and fans, with access to either Smart Array RAID 5 local storage or a storage area network (SAN). These industry-standard servers offer a variety of memory DIMM and input/output (I/O) slot expansion options.

HP StorageWorks storage

HP StorageWorks network storage solutions make it safe and easy to meet your desktop virtualization storage needs with flexible, open, standards-based storage infrastructure that delivers secure, highly available solutions coupled with the efficiency and ease of management of consolidated storage.

HP Thin Clients

HP Thin Clients are certified by VMware and designed to work in VMware View's virtual desktop environment. Every HP thin client includes a certified VMware View Manager broker (previously called VDM). HP leverages decades of experience in designing and manufacturing of PCs to make one of the most reliable thin clients available in market today. These small-form-factor clients help you cut power consumption, reduce support costs,

and increase security while potentially extending the replacement cycle for end-user computing devices. Your applications and data are stored remotely in data centers making it much more difficult for end users to lose or remove confidential data or to introduce new, unapproved software into the system. The HP Thin Client portfolio includes a choice of five popular operating systems to meet the needs of a broad range of customer segments: essential, mainstream, and flexible and HP provides free management tools that further reduce the overall total cost of ownership of thin clients. In addition, HP Thin Clients support multiple protocols including the Remote Graphics Software (RGS).

Core software

Virtualization: VMware View is a robust end-to-end universal client solution that includes VMware Infrastructure 3 to host the virtual desktops, View Manager 3 to manage the virtual desktops and user connections, View Composer for advanced image management and quick desktop provisioning, and ThinApp for streamlined application management. Your SAN hosts your system and application files.

- **VMware Infrastructure 3** hosts desktops as virtual machines on servers in your data center or another secure central location. This platform extends powerful data center capabilities to the desktop, such as high availability, disaster recovery, and business continuity.
- **VMware View Manager 3** allows end users secure, flexible access to their virtual desktops in the data center, and provides administrators a single point of control to simply and cost-effectively manage, provision, and deploy virtual desktops. It enables you to manage thousands of desktops at once and reduce the time it takes to provision a new desktop or update and patch an existing desktop from hours to minutes. A new Unified Access feature allows users to access their hosted desktops from a VMware

Business-driven benefits

HP VDI with VMware View can help your organization move beyond traditional approaches to the desktop environment. With HP VDI, you can:

- Bring the benefits of high availability to the desktop environment.
- Enable efficient desktop configuration and management through centralized resources, thereby speeding up deployment and reducing labor.
- Strengthen security and protect valuable business information by managing applications and data centrally while maintaining user isolation.
- Reduce your overall cost of desktop computing by centralizing management, administration, and resources.
- Gain more value from existing infrastructure investments by leveraging industry-standard hardware, management tools, and virtualization capabilities.
- Improve power and cooling costs through the use of HP server-based power management tools and HP Thin Clients.
- Obtain greater business agility through a flexible user access model that enables access to your virtual desktop from any device.

Infrastructure 3 environment, a Windows® Terminal Server environment, a blade PC, or even a remote physical PC. Virtual Printing further enhances the user experience by letting users print from virtual desktops to local devices without compatibility issues, bandwidth restraints, or complicated setup procedures.

- **VMware View Composer** uses linked clone technology to rapidly create desktop images that share virtual disks with a master image to conserve disk space and streamline management. User data and settings are segmented from the desktop image, so they can be administered independently. All desktops that are linked to a master image can be patched or updated through View Manager 3 simply by updating the master image, without affecting users' settings, data, or applications. This leads to a dramatic reduction in storage needs and costs while simplifying desktop management.
- **VMware ThinApp** application virtualization separates applications from underlying operating systems for increased compatibility and streamlined application management. Applications packaged with ThinApp can be run on servers in the data center and made accessible through a shortcut on the virtual desktop, further reducing the size of the desktop image and subsequent storage needs. Since the applications are isolated and virtualized, multiple applications or multiple versions of the same applications run on users' virtual desktops without conflict.

Management tools

The HP VDI solution provides the tools you need to more easily deploy and manage both virtual and physical resources. The solution leverages:

- **HP Insight Control suite:** The HP Insight Control suite is essential infrastructure management delivering the following capabilities: deploy servers, manage health proactively, optimize power confidently, and control from anywhere. With the HP Insight Control (ICE) suite for ProLiant servers, you can take control of your valuable time and transform the way you manage servers, giving your staff total control and greater flexibility—which should lead to tangible savings. In fact, some customers report that they have experienced a reduction in expenses by up to \$48,380 per 100 users, yielding a return on investment of 563 percent.² The software helps you:
 - Configure server hardware and deploy your chosen operating system and applications quickly and reliably.
 - Manage server health proactively and trigger critical alerts in a timely fashion.

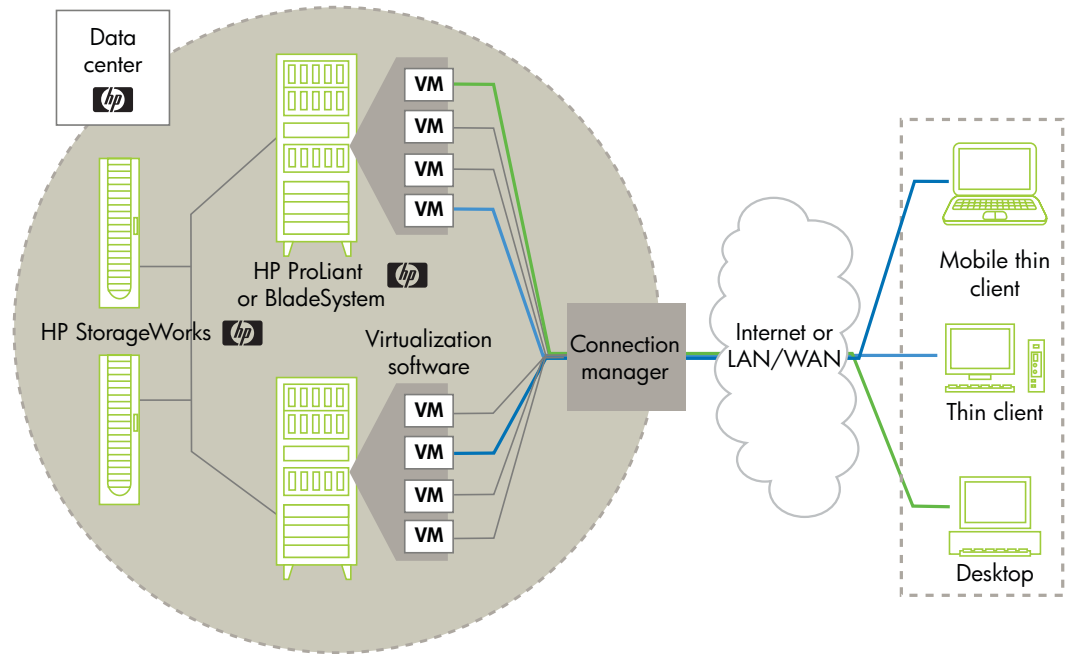
- Gain a true understanding of power consumption and thermal output and set power regulation policies across groups of servers.
- Take control of your servers safely from various locations, independent of OS state,² with remote management.

The HP Insight Control suite combines the capabilities of HP Systems Insight Manager (SIM), HP Insight Control, and HP Rapid Deployment software. HP Insight Control, now with Dynamic Power Capping, helps you understand power consumption and thermal output and set power regulation policies across groups of servers. With the enhanced HP Thermal Logic portfolio and services, customers can now take charge of power and cooling across their data centers, and triple the life of their data centers. HP SIM provides a centralized management console that simplifies and consolidates infrastructure management by discovering resources and monitoring them for health and performance. HP Rapid Deployment software allows you to deploy, configure, and license VMware ESX hosts in minutes.

- **VMware vCenter Server:** Using templates, vCenter Server (previously known as VirtualCenter Server) lets you rapidly provision pools of virtual desktop machines and monitor the performance of physical servers. It also intelligently improves resources, enables high availability to all applications in virtual machines, and makes your IT environment more responsive with virtualization-based distributed services, such as VMware Distributed Resource Scheduler (DRS), VMware High Availability (HA), and VMware VMotion.
- **HP Configuration Management (CM) Patch Manager software:** This software helps you avoid known software vulnerabilities by automating the patch management process—including acquisition, impact analysis, pilot testing, discovery, assessment, deployment, maintenance, and compliance assurance—verifying that devices are always configured correctly. Used in a VDI environment, HP CM Patch Manager maintains the operating system (OS) and applications within virtual machines. Using this policy-based software, your IT managers can accelerate the correct configuration of their software infrastructure and enhance the security and stability of managed systems.

HP VDI with VMware architecture:

The HP VDI architecture brings together a connection broker, thin clients, servers, shared storage, virtualization software, and management software.



How do you build a desktop virtualization solution? Follow these steps.

Here is a brief summary of how the individual VDI components come together to form a complete HP Virtual Desktop Infrastructure with VMware View solution.

HP VDI starts with an assessment of your VDI end-user requirements and existing infrastructure. Once this is known, you can configure your HP ProLiant and BladeSystem servers to provide a range of memory and I/O configurations to suit your architectural and load requirements.

1. If you have a multi-server VDI environment, we highly recommend that you connect the servers to scalable, shared storage from HP. The use of networked storage allows the virtual desktops to be stored and backed up centrally, with access from any server attached to the storage. Disaster recovery and live migration capabilities also require a networked storage infrastructure. For smaller VDI deployments, direct-attach storage offers a cost-effective alternative, but lacks some of the high availability features found with networked storage.

2. VMware virtualization software is installed on the servers to provide a many-to-one desktop-to-server ratio. The virtual desktops are hosted on storage devices or the servers themselves. The virtual desktops run standard desktop operating systems, such as Microsoft® Windows Vista® or Microsoft Windows® XP Professional operating system.
3. Many organizations choose to incorporate a connection broker, such as VMware View Manager 3, as part of their VDI solutions. The connection broker helps connect the desktop user to the appropriate virtual machine. It initiates and tracks connections between end users and resources based on policies you set. In addition, it offers enhanced functionality, such as load balancing and user verification against Active Directory, as well as enhanced deployment and management options.
4. A remote display protocol is used to allow the client devices in the desktop environment and the servers in the data center to interface over the network.
5. Consult your HP representative to determine the best solution for your needs.
6. Various client devices can be used in local and remote offices to complete the solution. HP Thin Clients are ideal access devices for your virtual desktop environment. You can also configure re-provisioned desktops, notebook computers, and even handheld devices to access virtual desktops.

Here are some of the best practices for desktop virtualization.

So what does it take to gain a high-performance virtual desktop infrastructure? Here is a look at some of the best practices and technologies for desktop virtualization. In our experience, these are all important points to consider when building a virtual desktop environment.

Sizing considerations

A good place to start is with five to six users per core. The actual count will depend on many factors, including the number of cores, the amount of installed memory, user workloads, the storage architecture, and more.

Storage and backup

Avoid I/O bottlenecks by dividing storage traffic across multiple controllers or disk spindles. When planning your storage infrastructure consider the performance needs of virus scans and patching, as well as normal user activity, so that your storage meets these needs. To enhance security, review data and user device lockdown policies to allow users to view data but not remove or copy data to external storage devices.

For SMB and workgroup deployments, consider low-cost network attach storage (NAS) solutions or the HP Clustered Gateway to store user data. This helps to maintain availability, and allows back up of file shares and user data, while leaving the virtual machines alone, as View Manager enhances their lifecycle. These practices help you improve the use of storage space while prioritizing data for backup.

Networking and protocols

Remember that network sizing depends on the remote protocol used, printing activities, and user device redirection. In making network sizing decisions, keep in mind that low network latency is critical—low latency means a better experience for end users.

With the HP VDI solution, you have multiple choices for your connection protocol. These protocols govern communications between the thin clients in the virtual desktop environment and the servers on the back end. The protocol you choose may have an effect on the network bandwidth and latency required for your VDI solution as well as the overall capabilities for things like streaming media and multi-monitor support.

Memory

Memory is a key consideration in choosing your virtualization platform. Look to achieve a large memory footprint by using less expensive dual in-line memory modules (DIMMs) across a large number of DIMM slots within the server. In addition, you can safely over-commit memory using VMware virtualization technology and HP ProLiant servers. You won't need as much memory per server due to VMware's memory management capabilities.

Operations

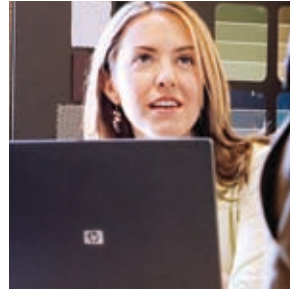
Plan for changes in your help-desk training competencies. Technicians may no longer need to be dispatched to the end-user site, but your help-desk staff may require additional troubleshooting knowledge.

Management tools

The use of a connection broker in a VDI architecture helps with load balancing and virtual desktop administration. In addition, the connection broker provides a central management tool for the system administrator to access virtual machine status and resource pool statistics.

Design and planning

We recommend that you work with an HP reseller or HP professional to develop a proof-of-concept for your VDI environment. This step gives you the chance to see your solution in action in a test setting and to customize the architecture for your particular user requirements prior to adding large numbers of users.



HP Services can help you bring it all together.

HP Services can help you design and transition smoothly to a virtual desktop infrastructure—without interrupting your usual program and business activity or over-extending your in-house IT support staff. Our vast portfolio of services allows you to use HP expertise as needed, tailoring it to your specific requirements.

Consider using HP Services to assist you with the major phases of implementing your HP Virtual Desktop Infrastructure. Our professionals can help you with IT service and desktop management, process and solution design, deployment onsite custom solution delivery, migration, and ongoing integrated support.

HP Services can deliver:

- Access to highly qualified experts who can cover all facets of your client, software, server, network, and storage infrastructure support needs, with a deep knowledge of multi-vendor hardware and software environments—not just HP technologies
- Comprehensive solution planning, design, implementation, optimization, and ongoing support services tailored to your virtualized environment needs
- HP Education Services that embrace the requirements of end users, system administrators, and support personnel—including online and instructor-led courses that build both core and advanced skill sets and can help you improve system performance and availability

In addition, HP Financial Services provides innovative financing and financial asset management programs to help you cost-effectively acquire, manage, and ultimately retire your HP solutions, including HP Virtual Desktop Infrastructure.

Ready to learn more?

To take a more in-depth look at HP Virtual Desktop Infrastructure and learn what it can do for your organization, visit www.hp.com/go/vmware/vdi. Among other resources, this site offers a downloadable white paper that provides insights into the configuration and sizing of your virtual desktop environment.

To find out more about desktop virtualization assistance from the HP Services organization, visit www.hp.com/services/virtualization.

To learn how HP Financial Services can help your organization move forward with your desktop virtualization initiative, visit www.hp.com/go/hpfinancialservices.

Or to discuss your desktop needs and goals, and how HP can help you meet them, contact your HP representative.

¹ "TCO Comparison of PCs With Server-Based Computing," June 15, 2006, Gartner Research

² "Gaining Business Value and ROI with HP Insight Control," IDC white paper, February 2008

Technology for better business outcomes

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