unidesk Desktop Layering for VDI™

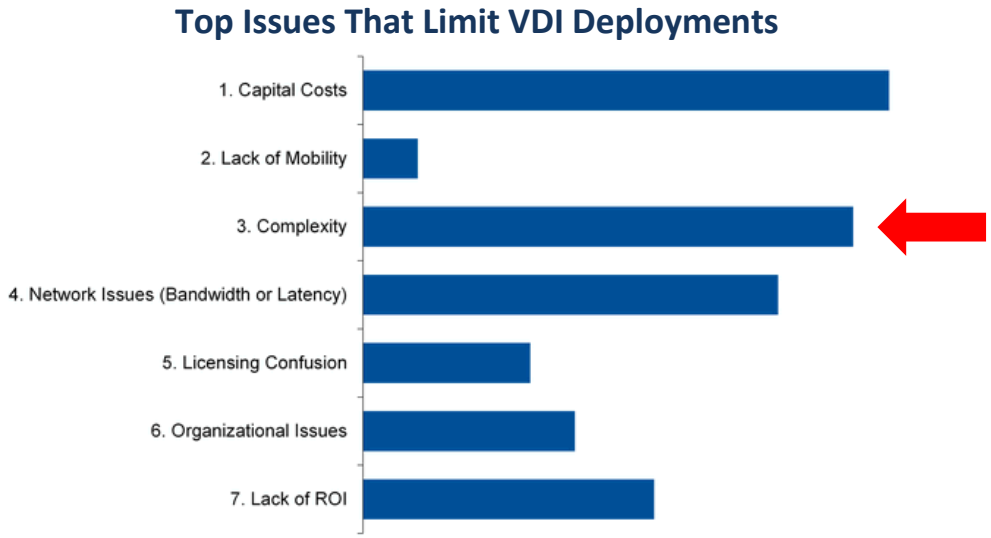
5 Tactics for Successfully Operationalizing VDI

IT organizations have found that managing Virtual Desktop Infrastructure (VDI) is so complex that the senior IT staff who designed and implemented VDI are needed for day-to-day administration. Learn the 5 tactics that IT teams are now using to simplify Citrix XenDesktop and VMware Horizon View deployments so VDI can be operationalized with Tier 1 IT administrators.

Introduction

Enterprises of all sizes are moving Windows desktops to public and private clouds for greater mobility, security, and manageability. To date, private cloud adoption is outpacing public cloud adoption. According to Gartner, the hosted virtual desktop market will hit 76 million users by 2016. IDC forecasts similar growth, predicting the on-premise and hosted Virtual Desktop Infrastructure (VDI) market will reach $1.3 billion in the next three years.

However, IT organizations are finding that the day-to-day management of virtual desktops is not going as expected. The IT architects who designed VDI are able to perform the daily storage allocation, host configuration, desktop provisioning, application delivery, image management, desktop break/fix, and Windows patching tasks. But when they turn these operational tasks over to less experienced, Tier 1 IT staff, the complexity of management causes VDI projects to stall.



Source: Is the Hosted Virtual Desktop Market Struggling to Grow? (Gartner, April 2014, Research ID G00259186)

The alternative is to continue relying on senior IT staff or consultants to manage VDI. However, this increases operational costs, impacts ROI, and diverts resources from strategic, forward-looking IT projects.

Fortunately, new technologies, tools, and techniques have emerged to make day-to-day management of VDI easier and minimize the complexity traditionally associated with Citrix XenDesktop® and VMware Horizon View™ deployments. This eBook gives you 5 tactics that organizations are using to transition virtual desktop management to Tier 1 IT staff and successfully operationalize VDI.

Tactic #1:
Use Layering to Deliver Your Applications

Application delivery is one of the biggest challenges managing VDI day-to-day. Early on, application virtualization was the recommended way to deliver applications to virtual desktops. But traditional application virtualization has three challenges that make it difficult for Tier 1 IT staff to take ownership:

- **Expert knowledge is required.** Microsoft App-V, VMware ThinApp, and other traditional app virtualization tools are effective at isolating applications to avoid conflict. However, isolation isn't needed for the majority of applications, and the time and expertise required to package applications in their own protective "bubbles" overwhelms lean IT teams. Desktop setup, pre-scans, post-scans, scripting workarounds, Windows registry tweaks, and package delivery can be mastered by a dedicated expert. But that expert will be needed every time a virtualized application needs to be "cracked open" to apply an update.
- **Not all apps can be virtualized.** Even if you have an expert, there's a long list of apps that cannot be virtualized with traditional application virtualization technology. Apps with system services and boot time drivers (e.g. antivirus, printers, scanners, etc.), homegrown apps, and apps with complex setup procedures often won't work.
- **Isolated apps cannot cross-communicate.** Application isolation puts apps into their own "sandbox," effectively hiding them from Windows and other apps. This is an advantage for the few apps that require different versions running on the same desktop (e.g. Java, Microsoft Access). But it is a showstopper for the majority of apps that need to share data, link to each other, and cross-communicate.

"Our first attempt at VMware Horizon View stalled. Too many apps wouldn't virtualize, and we were using a lot of resources trying to make them work. With Unidesk, we're layering printers, Office, QuickBooks, Adobe Creative Suite, Dymo LabelWriter, Odyssey court software, you name it. We're now over 400 virtual desktops and counting on 1 gold image."

Chris Mertens, Director of IT, Hamilton County Government, IN
Connect with Chris Mertens on LinkedIn | Read Hamilton County's VDI Success Story

Application Layering

Application layering technology from vendors such as Unidesk offers an easier and more complete way to manage applications in VDI. With layering, Windows itself and all applications can be packaged separately and then combined using file system and registry virtualization.

Layering technology captures every file and registry key that is different from the base Windows OS, and stores the application "layer" as a read-only virtual disk that can be mounted and shared by many VMs. After app layers are assigned to desktops in various combinations, the layering engine does the hard work of merging the files and registry keys in each layer into a unified file system to form a perfect virtual C: drive.

This approach – which operates above the hypervisor but just below Windows and occurs before a desktop boots – enables any application to be layered.

Layering an application is fast and simple. Here is how Unidesk does it:

1. A Tier 1 IT administrator or service desk administrators clicks Create Layer, gives the layer a name, description, and version number, selects the gold image of Windows that will serve as the base OS, and selects any prerequisite applications (e.g. if you are layering a Microsoft Office plug-in, you'll need Office as a pre-req).

2. Unidesk launches a prepped and ready virtual machine with just the Windows OS and prerequisite applications installed.
3. The administrator installs the application, running Setup and doing whatever they would normally do to install the app on a regular desktop.
4. The administrator clicks "Finalize" to save the layer as a shareable virtual disk. The application layer is now available to be assigned to any desktop.

This same process is followed whenever a layered application needs to be updated.

A big advantage of layering, in addition to simplicity, is that layered apps are not isolated. They appear to Windows and to other apps as if they are locally installed. As a result, organizations that use applications or plug-ins that depend on Microsoft Office and other core applications can layer the depending applications separately to make patching and updating fast and easy. Yet, they don't have to worry that the dependent apps won't work with the base application.

Tactic #2:
Use Next-Generation Arrays for Storage

Successful VDI depends on high performance storage. Yet traditional SAN provisioning is a pain. LUNs, WWNs, IOPS calculations, RAID management, performance tuning, tiering and caching, host/array block alignment, provisioning, and the other disciplines of legacy array management require that storage experts always be on hand.

"One of the primary reasons that the school district chose VDI is the ability to manage thousands of virtual machines with a small staff. Unlike the legacy SAN that required significant expertise, the Pure Storage FlashArray offers highly simplified management. When we first set up volumes it was so easy we thought we were missing something. It just works."

Robert Keith, Director of Technology, Waxahachie School District, TX
Connect with Robert Keith on LinkedIn | Watch Waxahachie's On-Demand VDI Webinar

Next-Generation Storage

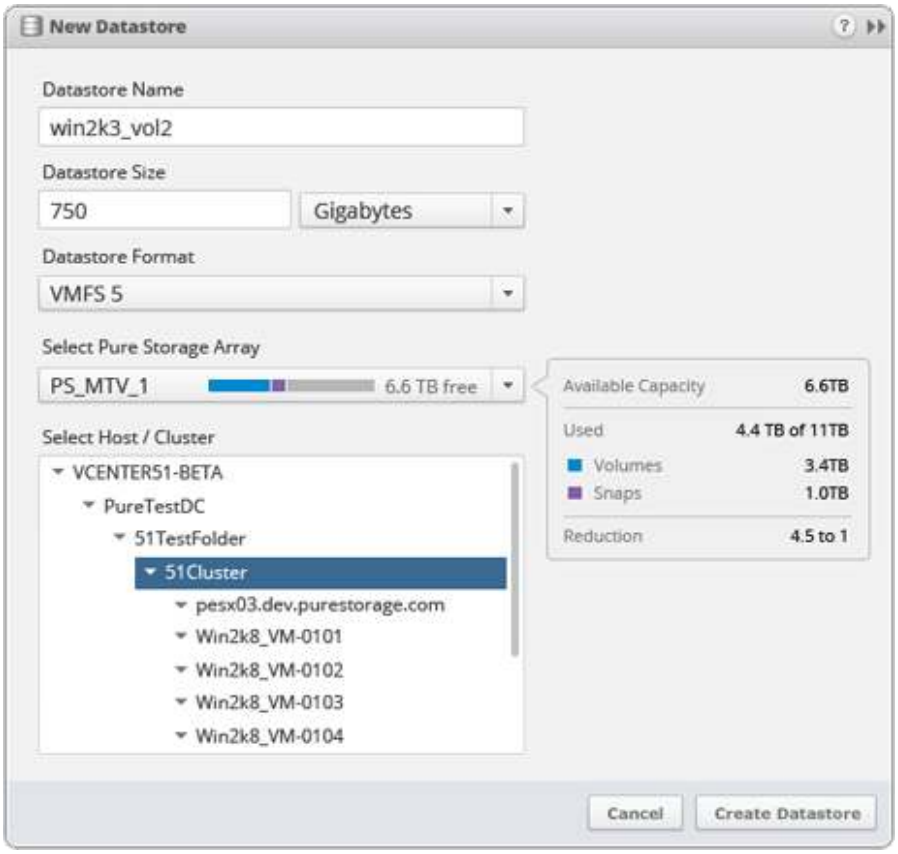
New storage solutions that leverage the falling price of solid state drives (SSD) and flash memory and that are designed for virtualized environments have given IT organizations new ways to cost-effectively meet the performance requirements of demanding virtual desktop workloads, while greatly simplifying storage administration:

- **Flash-optimized hybrid storage.** Hybrid SAN arrays from vendors such as Nimble, Tegile, and Tintri use high performance RAM and/or SSD in combination with traditional HDD to optimize capacity, performance, and cost. Frequently accessed (hot) data is cached in the SSD or RAM tiers and writes are coalesced to maximize performance, while infrequently accessed (cold) data is stored on HDD to maximize capacity.
- **All-flash storage arrays with data reduction technology.** All-flash arrays from vendors such as Pure Storage offer inline data reduction techniques including deduplication, compression, and thin provisioning to dramatically reduce the data footprint. The result is a logical array size that is 5-10X larger than its actual raw capacity, driving down the cost per GB and making all-flash storage affordable.
- **Software-defined storage.** Converged server and storage systems from vendors such as Nutanix enable lower-cost local storage to be managed as part of a virtual storage pool shared by many hosts. This allows enterprises to fully leverage server-attached flash technology, and avoid the end-to-end latency incurred when flash is simply added to centralized, network-based storage systems.

Many of these newer solutions automate storage in a single-screen wizard, so creating a new datastore is as easy as specifying:

1. Name
2. Size
3. Host/cluster

All the other hard work is done automatically in the background. Storage is provided as one big pool, so your Tier 1 admins can just create volumes and go. Here is how Pure Storage does it.



The newer storage solutions also recognize that virtual infrastructure administrators live in the world of vCenter and SCVMM. So they've designed their arrays to fit into daily workflows. You can create, grow, or delete datastores; drill-in to datastore capacity; see real storage consumption through dedupe and compression; understand datastore IOPS, latency, and bandwidth; and see a full datastore-host mapping, all from centralized consoles and plug-ins to existing virtual infrastructure platforms.

Tip #3:
Offload Management of One-Off Apps to End Users

In the early days of VDI, the best practice was to create non-persistent desktops. At the time, it was thought that this approach would reduce disk space requirements and simplify management. As with application virtualization, it didn't have the intended result:

- **Knowledge workers rebelled.** With non-persistent desktops, all settings, data, and user-installed applications are lost after every desktop patch. This might be acceptable to some task workers, but not to knowledge workers who require a customizable desktop experience. Profile management helps preserve some changes, but cannot capture vital user-installed applications and plug-ins. Profiles also add additional management complexity and I/O overhead.
- **Management complexity increased.** The "free" tools included with VDI brokers to create and manage non-persistent desktops are too difficult to use for lean IT teams. The separate consoles needed to reduce disk space, provision desktops, patch Windows, virtualize applications, and manage profiles and personas are why Gartner cites complexity as the #2 reason VDI projects struggle to grow.
- **All applications must be delivered by IT.** Since applications installed by end users on their non-persistent desktops are lost, the burden of application delivery falls completely on IT. Given the many one-off applications that are required by individual users, centralized delivery of all apps quickly becomes a barrier to operationalizing VDI.

"Our users are architects and engineers who need one-off apps and plug-ins. Unidesk persistent desktops preserve their customizations without adding IT overhead or consuming all our storage. Layering is amazing. It really brought everything together for us. With Unidesk as our management platform, our Tier 1 folks now handle VDI day-to-day and we've been able to scale VMware Horizon View as originally planned."

Matt Dierolf, Manager of Network Systems, STV, Inc.
Connect with Matt Dierolf on LinkedIn | Watch STV's On-Demand VDI Webinac

Persistent Desktops with Layering Preserve One-Off Applications

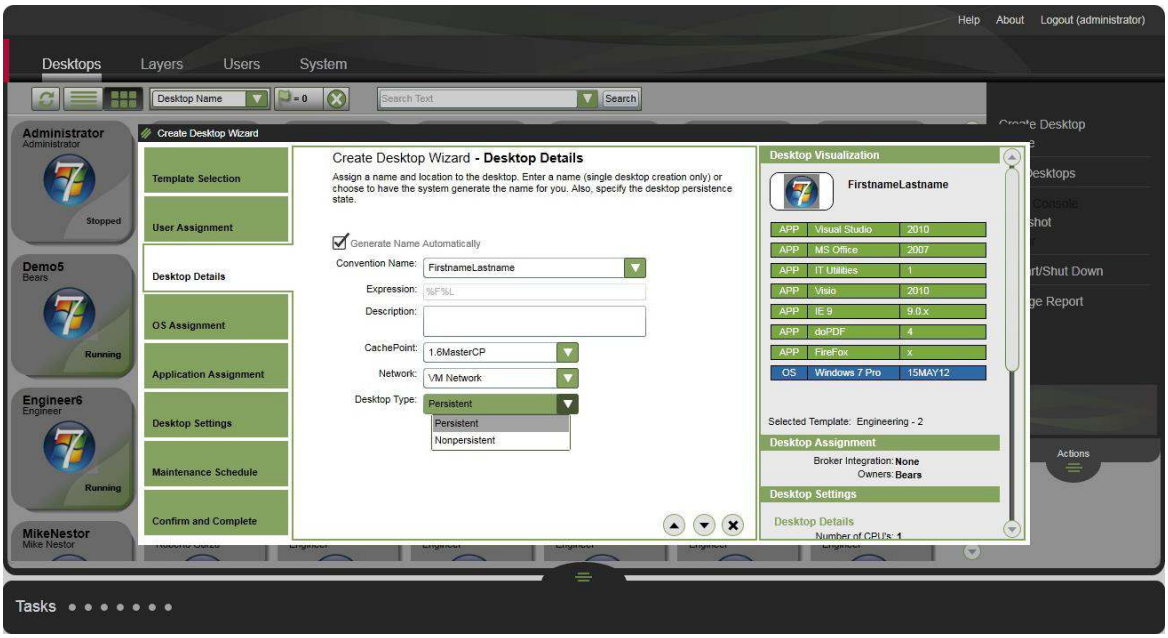
Layering technology eliminates the old issues of persistent desktops using too much storage and having to manage full Windows and application images on every desktop. With layering, Windows OS and application layers are updated and stored once as read-only virtual disks,

enabling them to be shared by many VMs, and making persistent desktops as storage-efficient and as easy-to-manage as non-persistent desktops.

Layering solutions such as Unidesk enable persistent and non-persistent desktops to be provisioned from one interface using the same shared Windows OS and application layers. The only difference is whether the Personalization layer is erased after each use.

Here is how Tier 1 administrators provision desktops with Unidesk:

1. Click Create Desktop.
2. Select Persistent or Non-Persistent from the Desktop Type dropdown menu.



3. Select the Windows OS and Application layers that will be assigned to the desktop.
4. Select the broker that will be used to access the Unidesk-provisioned VM (e.g. Citrix XenDesktop, Microsoft RDS, VMware Horizon View).
5. Set the size of the Personalization layer that will store local profile settings, user-installed applications, and data (effectively a “quota”).
6. Select how often the Personalization layer will be backed up.

Any applications or plug-ins that an end user installs are automatically written to the desktop’s Personalization layer. These apps and plug-ins will persist no matter how often the underlying read-only OS and application layers are updated by IT.

End users can be trusted to install their own apps without worrying about interfering with the Windows and application layers centrally managed and delivered by IT. With the burden of managing one-off applications shifted to the end users, lean IT organizations are better equipped to operationalize VDI.

Tip #4:
Empower Service Desk to Handle Desktop Break/Fix and Backup/Recovery

Giving users persistent desktops that they can customize makes them happier and more productive and offloads one-off application management from IT. But it will also result in users "breaking" their desktops.

Traditionally, break/fix required costly, time-consuming escalations to Tier 2 or 3 IT administrators. How costly are such escalations? Gartner research shows that the cost of desktop support ranges from $100-500 per incident for Level 2/3 IT staff, compared to only $10-37 per incident for Level 1 service desk analysts (Source: "How to Reduce the Cost of PC Support," Gartner Research ID G00211079, March 2011).

The alternative is to re-image their desktop and blow away all user personalization. While this will certainly fix their corrupted registry and get rid of any malware that they downloaded, the productivity loss from users having to re-personalize their desktop won't make IT many friends.

"We have a broad set of use cases including a large development team and practicing physicians who need fully persistent desktops. If somebody installs something that completely breaks their desktop, I have the option to roll them back to a snapshot of their personalization layer. As far as they see, just their apps are reset. All of their other customizations are still intact. It makes it much easier to fix things."

Richard Savage, Systems Administrator, USF Health
Email Richard About VDI | Watch USF Health's VDI Webinac

Layering Enables Simple, Space-Efficient Desktop Repair and Recovery

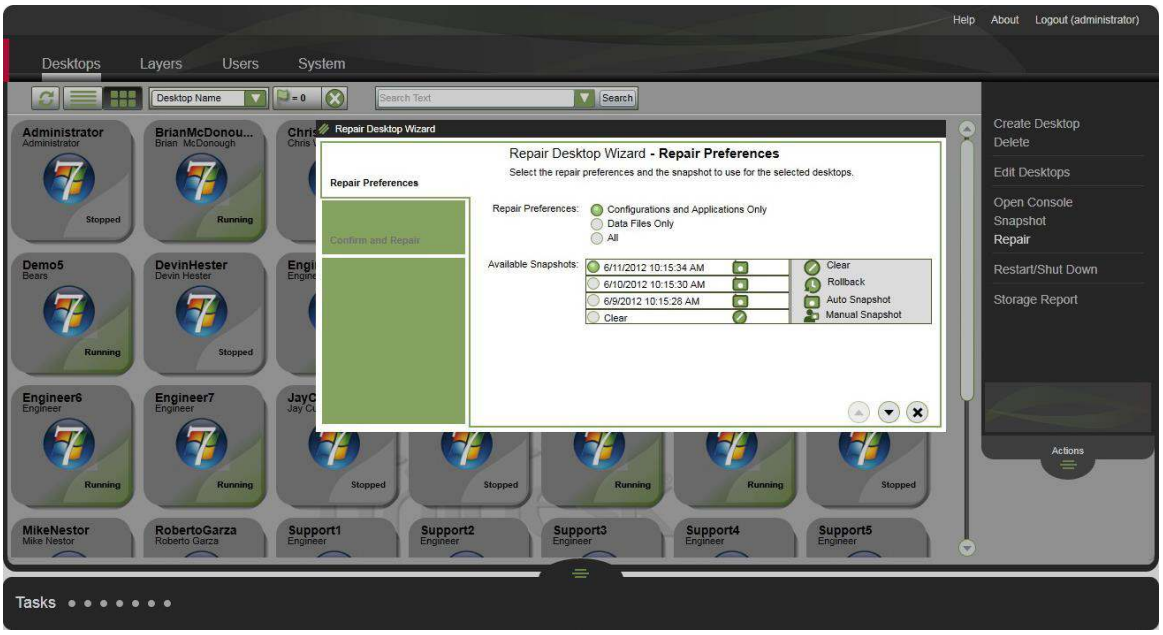
Desktop layering solutions such as Unidesk enable Tier 1 Service Desk staff to repair and recover any type of desktop in minutes, without a complete loss of personalization.

All user customizations – local profile settings, data, and user-installed apps – are captured in each desktop's Personalization layer, a writeable virtual disk that's unique to each VM. Unidesk snapshots all Personalization layers as time-stamped versions, enabling Level 1 service desk staff to do break/fix simply by assigning an earlier version to the desktop and rebooting. Most of the users' personalization will be intact. But any malware, DLL conflicts, or viruses they've introduced will be gone.

The Personalization layer snapshot is also a space-efficient, easy way to offer desktop backup and recovery. Since the Windows OS layer and application layers are stored once as read-only virtual disks and shared by many virtual desktops, there is no need to backup multiple copies of these layers. Any desktop can be recovered simply by assigning any snapshot of the desktop's Personalization layer on top of the centrally stored and backed up OS and Application layers.

Here is how Tier 1 Service Desk analysts repair and recover desktops with Unidesk:

1. Login to the Unidesk Management Console using the help desk "role," which limits the tasks that the service desk analyst can perform.
2. Select the desktop that is having problems.
3. Click Repair. The Repair Desktop wizard will display the date/time stamped snapshots of the Personalization layer.



4. Select whether the entire desktop will be rolled back, just user installed applications, or just locally saved documents and data.
5. Reboot the desktop.

With the simplicity offered by desktop layering technology, desktop backup/recovery and break/fix in VDI environments can be operationalized using Tier 1 administrators.

Tip #5:
Reduce the Number of Management Consoles to 1

For decades, IT organizations could rely on PC configuration management software, recently renamed by Gartner to Client Management Tools, to help reduce the costs of managing distributed PCs. Using these tools, Tier 1 administrators have been able to operationalize PC management. These PC tools, however, are of limited value in the new world of desktops in the cloud.

To manage virtual desktops, administrators have had to cobble together a collection of tools included with their brokering platforms for day-to-day desktop provisioning, image management, storage optimization, application delivery, Windows patching, break/fix, and personalization:

- Citrix includes vDisk, Provisioning Server, Machine Creation Services, XenApp, User Profile Management, and Personal vDisk as part of Citrix XenDesktop.
- VMware includes Linked Clones, View Composer, ThinApp, CloudVolumes, Mirage, and Persona as part of VMware Horizon View.

The complexity of these tools and the sheer number are at the root of why Gartner cites complexity as the #2 issue limiting VDI deployments. It is also the reason VDI cannot be operationalized with less experienced IT administrators.

"Even though we have a lot of desktops with a wide variety of complicated software, we're down to only one gold image, giving us even more efficiency. App delivery and image management are so easy, our IT interns are managing VDI! I only wish we had implemented Unidesk sooner because it has made our process of deploying and managing VMware View so much smoother."

Jim Nonn, CIO, Egan Company

Connect with Jim Nonn on Linked In | Read Egan's VDI Success Story

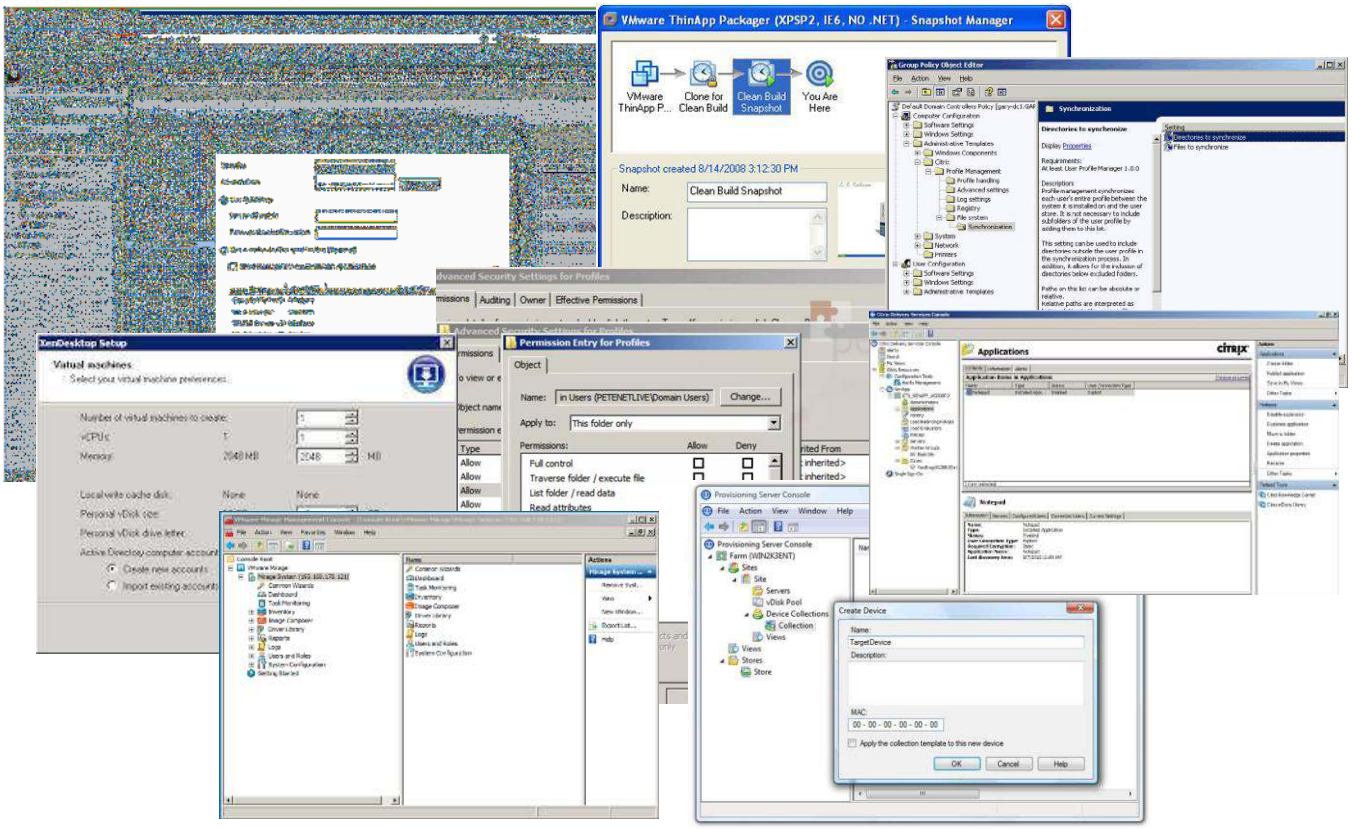
Unified VDI Management Simplifies Daily Desktop Operations

A simple, comprehensive virtual desktop management solution is needed to make Windows in the cloud easy to manage for lean IT staffs and Tier 1 administrators. Unidesk has emerged as the leading solution in this category. Its all-inclusive management capabilities are delivered in a single, easy-to-use web interface that can be easily mastered by non-experts.

Unidesk Composite Virtualization® technology makes this possible. The game-changing invention virtualizes everything above the hypervisor – Windows OS, Applications, and Personalization – into separately manageable "layers." Layering makes desktop provisioning, storage optimization, application delivery, image management, patching, personalization, and desktop repair remarkably simple.

The difference between having just a broker and Unidesk compared to a broker and many separate tools is often the difference between operationalized VDI and stalled VDI.

vs.



Summary

Deploying and managing Windows desktops in the cloud doesn't have to be hard. It also doesn't have to require high level IT staff resources or costly IT consultants. With the right management toolset and infrastructure choices, lean IT organizations in small, medium, and large enterprises are successfully operationalizing Citrix XenDesktop and VMware Horizon View implementations with Tier 1 administrators. If you follow the tactics and lessons learned from the customers profiled in this eBook, you can, too.

Unidesk Corporation, 313 Boston Post Road West, Marlborough, MA 01752 USA Tel 508-573-7800 Fax 508-573-7801