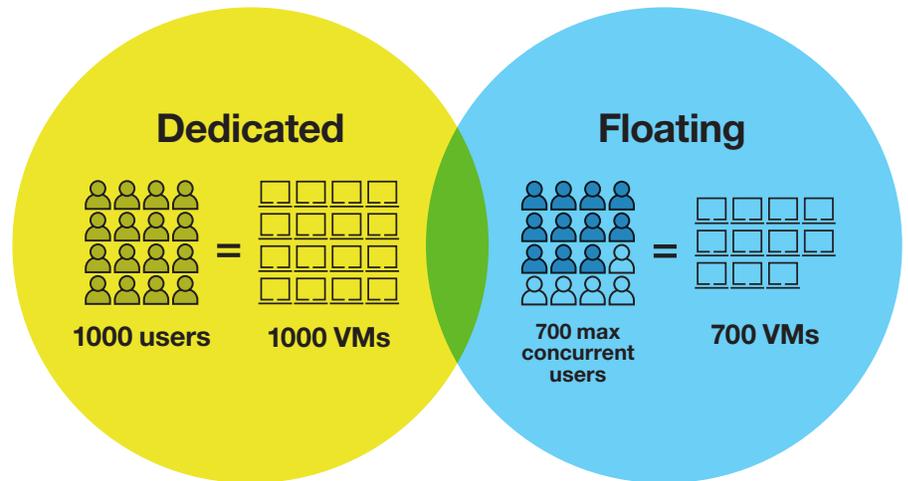


Horizon Virtual Desktops

A Guide to Your DaaS Architecture with Virtual Systems



Horizon DaaS: Beginning Architecture Considerations

Horizon DaaS from Virtual Systems is the only Desktop-as-a-Service platform to offer the ability to deploy full VMWare VDI architecture on demand with no deployment minimums in either a full-cloud or hybrid cloud model. This brings all the benefits of VDI to a “push-button” deployment model and even the flexibility to retain software and apps on-premise or bring them to the cloud as you see fit.

Now, businesses who have already deployed VMWare VDI, can consume it in a low-cost OPEX model and businesses who have been considering VDI but held back due to cost, complexity, or cloud confusion can deploy it with a team of experts behind them.

Whether you’re new to VDI or you’ve been managing Horizon for years, an architectural overview is a great way to start considering (or re-considering) your end-user strategy. VDI can bring significant workflow efficiencies, important security benefits, and substantial cost-savings to your business but many of those benefits are hidden in your VDI architecture decisions. Your end-user needs are unique so use this guide to help you understand your options, maximize the benefits of VDI, and transform end-user computing for your business.

Traditional VDI architecture requires a pod of ten or more Virtual Desktops that utilize a small security server, a connection server, and a domain controller in the data center with the desktops. The connection server facilitates connections from users on the thick client or web to the desktop they’ll be assigned to. The security server is located in the DMZ of the network to pass only secure traffic to the connection server. Application servers may also be hosted in the data center or, alternatively, a VPN configuration might be utilized so desktops can talk to application servers and/or data stored in your own environment. Older conventional wisdom suggested VPN’s between the desktop and app servers could introduce unnecessary lag to the user experience but improvements to VMWare’s VDI architecture over the last 24 months have remedied that problem to an almost imperceptible level. Depending on workloads, desktop pods benefit from additional connection/security servers at around the 250 level. These pods can be spread across data centers (to mitigate single-point-of-failure risk) or they may be contained in the same data center. As we examine further architecture options, start with this basic framework in mind.

Getting Started: Provisioning Users

VMWare Horizon offers two Desktop Pool Types, two User Assignment Options, and two Desktop Provisioning Methods. The result is eight basic architecture designs and almost infinite variations that you can use to create the ideal solution for your business. The following pages will help you navigate these options as you consider the best way to support end-users, streamline IT procedures, secure infrastructure, and control costs.

Pool Types:
Automated + Manual



Assignment Options:
Dedicated + Floating



Desktop Provisioning:
Full Clones + Linked Clones

Pool Types: Automated & Manual

Automated	Manual
Typical setup Create on demand from master image Managed by vCenter	Atypical, used in special circumstances Already existing desktop <ul style="list-style-type: none"> • Managed by vCenter • Unmanaged by vCenter • Physical desktop

With an **automated pool**, vCenter Server is used to create the virtual machines automatically from a master image. An automated pool will almost always be used in every deployment. Horizon will then use vCenter to manage the VMs, such as power them on, delete them, re-create them, and so on.

With a **manual pool**, the desktop(s) already exist and could be a virtual machine both managed and unmanaged by vCenter or even a physical desktop. This pool type is atypical but it's important you're aware of it in case you see the need for a Manual Pool in your work environment.

Assignment Options: Dedicated & Floating

Dedicated	Floating
User is assigned specific desktop <ul style="list-style-type: none"> • No other users may use that desktop Desktop allocation before or during log on	User can log on to any available desktop in pool Users retain profiles and applications across desktops

Dedicated user assignment is just that, a named user is assigned a specific desktop in the pool. No other users may use that desktop, even if the assigned user is not logged on and there are no spare desktops in the pool. Additionally, with dedicated assignment, users may either be assigned a desktop before they log on or, alternatively, the first time they log on an unused desktop will be allocated to them.

(e.g. DOMAIN\jane.doe is assigned to desktop VDI-W8-123).

Floating user assignment allows a user to log on to any desktop that is available within the desktop pool. Each time a user logs off and on, they will get a different randomly selected desktop each time. Users retain their unique profiles and application sets even though they're assigned different desktop resources.

(e.g. Log on 1: DOMAIN\jane.doe assigned desktop VDI-W8-001
Log on 2: DOMAIN\jane.doe assigned desktop VDI-W8-321)

Desktop Provisioning Methods: Full Clones & Linked Clones (Horizon Composer)

Full clones utilize a master image in template format. The master image is built exactly as required and the template is cloned by vCenter the required number of times to the exact same size as the virtual machine. So, if the virtual machine is 25GB in size and you have 100 VMs, that is 2.5TB. Of course this requires a large amount of storage and a significant amount of time to provision that many VMs. Once the desktops are created, they are completely independent copies of the master image which must be managed and updated by another tool such as Altiris, WSUS, SCCM and various scripts as required.

Linked clones utilize a feature called Horizon Composer which decreases the storage space required and improves management. Linked clones utilize a master image in virtual machine format with at least one snapshot which represents the version instance of the master image you wish to create the desktops in the pool from. When a linked clone desktop pool is created, a replica VM (parent) is first provisioned, then the required number of desktops are created as a child VM of the replica VM. These linked clone desktops read from the replica disk and write changes to a different disk. Initially before being powered on are KBs in size and during daily use can range from 1-5GB depending on OS, apps, page file and usage. However, they represent around an 80% storage space saving on full clones. Furthermore, with linked clones, it is possible to configure the pool to refresh or delete the desktop at log off, ensure the desktop is exactly as per the master image, and discard the different disk changes that have occurred.

Full Clones	Linked Clones
Utilize master image (template format)	Uses Horizon Composer
Process: <ul style="list-style-type: none"> Cloned by vCenter Required number of times to the exact same size as the virtual machine 	Process: <ul style="list-style-type: none"> Utilize master image (VM format) Cloned by vCenter Replica VM (parent) is first provisioned, then the required number of desktops are created as a child VM of the replica VM
Desktops are completely independent copies of master image	Designed to: <ul style="list-style-type: none"> Decrease storage space Improve management
Tools used to manage: <ul style="list-style-type: none"> Altiris WSUS SCCM 	



ThinApping to Supplement Your Desktop Pool Type

You might already be able to see that Automated Linked Clone Floating Pools have strong benefits and are a typical configuration. While it's a strong architecture, it may not always be the best for every user group. Your solution may likely include both full clones and linked clones. Understanding the user groups that may be departmental and what applications they use will inform your direction in this. In most cases all users require a standard application stack such as Windows 10, O365, Adobe Reader, Flash, etc.

However, in addition to this, you may find a department which this standard stack suffices but a couple of users that also require another 3rd party application. In this case rather than creating a separate pool just for this small requirement, ThinApp could be utilized to capture the application and make it available to those two users in the desktop pool. This saves having to clone the master image, install the two applications and manage two master images.

It would not be good practice to create the desktop pool as full clones because of a few

requirements such as this. Doing that might have a dramatic effect on the underlying storage requirements and costs.

If you do have a scenario where an application cannot be ThinApp'd and a group of users must be able to for example install their own applications, this is a requirement for an automated full clone pool. However, a desktop in this pool might have a higher cost associated with it due to increased storage (e.g. 25GB to 75GB) and also increased management (e.g. solution required to update/manage desktop – Altiris, SCCM).

Complex Example: Jonny's Skateboard Emporium

Let's look at a rollout architecture that includes multiple user groups with varying application stacks, different pool types, and some ThinApping.

	Call Center	Finance Department	Finance Manager	Engineering	Developer
Profiles	250 Total People 200 Concurrent Users	10 Total People 10 Concurrent Users	2 Total People 2 Concurrent Users	100 Total People 75 Concurrent Users	5 Total People 5 Concurrent Users
Application Requirements	MS Word MS Outlook CRM (web-based)	MS Office Salesforce Finance app Payroll app	MS Office MS Project Salesforce Finance app Payroll app	MS Office Visio Engineering client app	MS Office MS Visual Studio Admin rights to test and to install any development application
Recommended Pool Type	Automated Linked Clone Floating	Automated Linked Clone Floating	Automated Linked Clone Floating	Automated Linked Clone Floating	Automated full clone dedicated
Storage Required	1.25 TB vs. 6.25 TB	50 GB vs 250 GB	–	500 GB vs 2.5TB	–
Rationale	All users require a standard app stack	Users require standard app stack plus some finance-related applications.	Use existing Finance department master	Use Call Center master	Users must have their own desktop to install applications and test.
New Master Image	Yes	Yes Cannot ThinApp Salesforce, so must create a new master image for finance.	No ThinApp MS Project	No ThinApp Visio and engineering client app	Yes It's not possible to ThinApp each test environment. Requires a 3rd master image with the base development tools included

Complex Example: Jonny's Skateboard Emporium

- **Call Center Users**

Suggested Pool Type: Automated Linked Clone Floating Pool

Why: 1.25TB storage instead of 6.25TB, only requires standard app stack, one master image to update for 250 users.

- **Engineering Staff**

Suggested Pool Type: Automated Linked Clone Floating Pool

Why: 500GB storage instead of 2.5TB, Only require standard app stack so keep with the original master image, Visio and engineering client app ThinApp'd. Still two master images to update for 362 users!

- **Finance Department Users**

Suggested Pool Type: Automated Linked Clone Floating Pool

Why: 50GB storage instead of 250GB* without replica, only require standard app stack plus some finance related applications. Cannot ThinApp Salesforce, so create a master image for finance. Takes it to two master images to update for 260 users.

- **Developer**

Suggested Pool Type: Automated Full Clone Dedicated Assignment

Why: These users must have their own desktop to install application in and test. It is not possible to ThinApp each test build and the developers are constantly installing new development tools. Requires a 3rd master image with the base development tools in. Updates are managed by Altiris.

- **Finance Manager**

Suggested Pool Type: Automated Linked Clone Floating Pool

Why: Utilize the existing finance linked clone floating pool, and ThinApp MS Project and only make available for the two required users. Still two master images to update for 262 users. If a 3rd user needs MS Project then add them to the group to use it, still no change in required pools.

Conclusion

The result here supports 367 unique profiles with 292 total virtual desktops in five distinct departments using only three master images. We've kept operational management simple, saved money by using "floating pools," and

introduced storage savings by applying linked clones and ThinApping where possible.

The options you'll find in Horizon should spark some dialogue on your IT team about the strategies that

best fit user groups in your organization. Keep the dialogue going with your Virtual Systems account team to figure out which methods might apply to your work groups and how to best deploy them!