



VMware Horizon Reference Implementation Case Study for Global Car Manufacturer

Architecture for 2,100 End Users and Multiple Data Centers

TECHNICAL WHITE PAPER

Table of Contents

Introduction	3
VMware Reference Implementation Case Studies	3
Executive Summary	4
Implementation Overview	4
Project Overview	4
Architecture Overview	5
VMware Horizon	5
Horizon Solution Components	6
Global Car Manufacturer Reference Implementation	7
Business Drivers, Business Case, and Benefits	8
Business Drivers	8
Business Case	9
Business Benefits	9
Project Overview	10
VMware Professional Services	10
Pilot Phase	11
Two-Year Project	11
Lessons Learned	12
Architecture	13
View Block Design	14
VMware Workspace	16
VMware ThinApp	17
Resiliency, Business Continuity, and Disaster Recovery	18
Conclusion	19
Authors and Contributors	20
References	20
Learn More	20
About VMware	20

Introduction

This document is a reference implementation case study for VMware Horizon® at a global car manufacturer based in the United Kingdom. The solution delivers desktop virtualization for 2,100 concurrent users from two data centers. This case study illustrates how deploying Horizon with View provides tangible business benefits and cost savings. This document includes an architectural overview and key configurations to deploy the solution.

The intended audience is technical decision-makers considering deploying Horizon with View at scale. The executive summary and business benefits sections are also suitable for nontechnical decision-makers.

VMware Reference Implementation Case Studies

A reference implementation case study shows how specific customers in differing geographies and industry verticals have deployed and benefited from a VMware solution. It details the project approach, the business benefits for a specific customer site, the lessons learned, and the architecture used. These implementations are usually based on reference architectures validated by VMware.

A reference implementation is built on a foundation of best practices, but trade-offs are made to meet specific project requirements or constraints. When referencing these implementations, it is critical to know where the architecture has deviated from best practice and where improvements could be made. To understand the modifications, you can compare a reference implementation to VMware reference architecture documentation. For information about other technical reference architectures, visit [VMware Horizon with View Design resources](#).

This case study is intended to help customers—IT architects, consultants, and administrators—involved in the early phases of planning, design, and deployment of Horizon-based solutions. It provides an example of a successful implementation that meets specific industry vertical challenges and the benefits gained.

Executive Summary

The customer needed to deliver on its promise of “anytime, anywhere, and any place” by improving its end-user computing technology while maintaining tight control of intellectual property, delivering rapid provisioning, and supporting a bring-your-own-device (BYOD) initiative.

The project’s key requirements included:

- Leverage technical agility to increase speed and flexibility to implement new engineering design center
- Implement and migrate to a standardized Windows 7 desktop build
- Access virtual desktops from any device, such as laptops, thin clients, and iPads
- Remove the need to supply and manage desktop hardware to offshore and external contractors

Three distinct business areas to benefit from the project were identified:

- Offshore workers
- Executive users
- Purchased services (external users)

The company is transitioning to outsource its IT operations to a support provider. In addition it is laying the foundation for a new strategy behind desktop and application delivery. The ability to support this business growth is driven by the following objectives:

- End-user computing transformation
- Enterprise desktop delivery platform
- Global end-user computing IT function
- Lower IT running costs

The solutions team evaluated VDI technologies and selected VMware vSphere® 5.0, VMware Horizon with View, VMware Workspace™, and VMware ThinApp® as the preferred technologies.

Implementation Overview

The Horizon implementation is deployed across two data centers in an active-active configuration providing 2,000 virtual desktops and 100 brokered physical desktops. The implementation follows a modular design, which enables the environment to be easily scaled up beyond the original designed capacity.

Project Overview

The desktop virtualization project was initiated with a proof of technology (PoT) of the View, Workspace, and ThinApp products in August 2012 to assess whether the proposed solution would fit the customer’s needs.

Hewlett-Packard (HP) was selected to deliver the hardware infrastructure and project management. VMware Professional Services was engaged to lead the design activity, which is structured to follow VMware best practices and methodology.

The PoT was implemented in February 2013, and users were invited to participate in this new environment. After the PoT was successful and well received, VMware Professional Services architected the View, Workspace, and ThinApp design for 2,100 concurrent users. Because the PoT design is intended for a production-ready environment, the project team was able to quickly and effectively transition users onto this platform.

Architecture Overview

The architecture of the VDI solution consists of two data centers in an active-active configuration on a VMware virtual infrastructure. HP blade technology with 3PAR storage arrays provides the physical platform for hosting the Horizon with View environment for 1,000 users in each data center.

VMware View® 5.3 brokers desktop sessions to users. It is tightly integrated with vSphere 5.3, which provides ease of management and less complexity than comparable VDI solutions. View is also used to broker 100 physical performance workstations for computer-aided design (CAx) users.

ThinApp is used as the application virtualization technology. Application delivery is performed via Workspace.

This architecture leverages standard infrastructure services, such as Active Directory (AD), user profile, data, printing, software deployment, and management. The data center architecture is designed to meet disaster recovery requirements and enable the business to continue operating in the event of a failure at one of the data centers.

VMware Horizon

Horizon is a desktop virtualization solution that simplifies IT manageability and control while delivering the highest fidelity end-user experience across devices and networks.

IT organizations can automate desktop and application management, reduce costs, and increase data security by centralizing the desktop environment. This centralization results in greater end-user freedom and increased control for IT. By encapsulating the operating systems, applications, and user data into isolated layers, IT organizations have greater flexibility and control over how they deliver a desktop. The Horizon with View solution lets IT deliver dynamic, elastic desktop cloud services, such as applications, unified communications, and 3D graphics, to promote increased productivity and greater business agility.

Horizon is built on and tightly integrated with vSphere, the industry-leading virtualization platform, allowing customers to extend the value of their VMware infrastructure and its enterprise-class features, such as high availability, disaster recovery, and business continuity. Support for vSphere leverages the latest functionality of the cloud infrastructure platform for highly available, scalable, and reliable desktop services.

For more information, see the [Horizon with View documentation](#).

Horizon Solution Components

Typical VMware Horizon deployments consist of several common components, as shown in Figure 1, which represent a typical architecture.

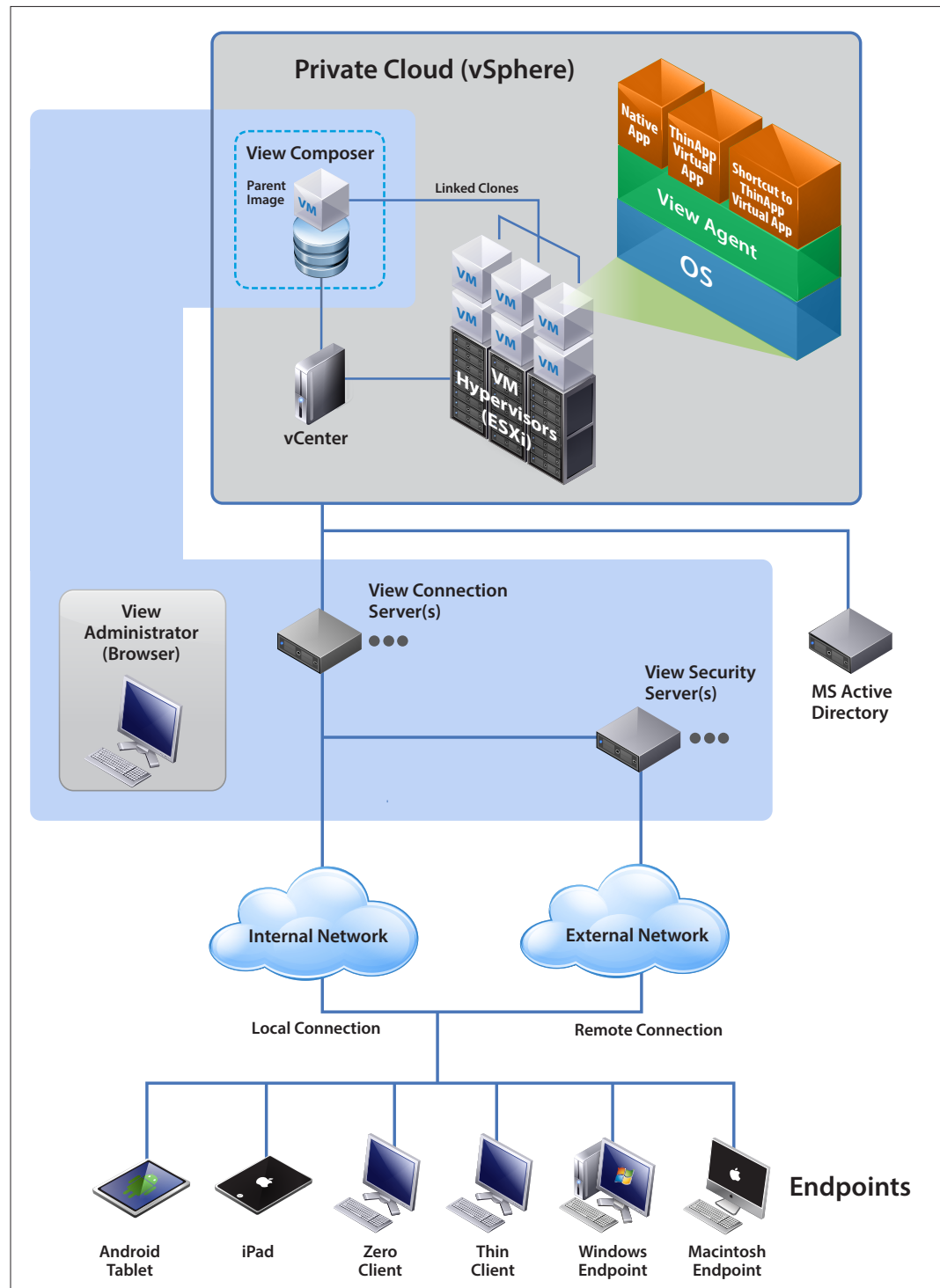


Figure 1: Typical Horizon with View Architecture

Global Car Manufacturer Reference Implementation

The Horizon implementation is deployed across two data centers in an active-active configuration providing 2,000 virtual desktops and 100 brokered physical desktops for five types of users:

- Standard users (office based)
- Agency and purchased services (external vendors and contractors)
- UK executive users (office and home based)
- Offshore users (workers in India, China, North and South America, and Australia)
- CAx (Computer-aided design users)

The virtual desktops are distributed across the two data centers, which provide a disaster recovery solution. In the event of an outage at one of the sites, 50 percent of the staff can continue to be operational at full performance capacity or all users at 50 percent of performance capacity.

The company uses ThinApp to virtualize applications. The applications are managed by Workspace, which integrates the applications into the View desktop.

Of the 2,100 desktops, the following table is a breakdown of the desktop types brokered by Horizon with View:

DESKTOP TYPE	QUANTITY	DESCRIPTION
Floating desktop	1,400	Standard desktop build
Dedicated desktop	600	For users that require persistency with their desktop, estimated to be 30 percent of staff
Brokered physical workstation	100	CAx users with DELL R5500 physical workstations

Table 1: Desktop User Types




HP assessed the physical desktop infrastructure to gather current desktop configuration and measure resource utilization metrics. VMware Professional Services used this data to size the Horizon with View solution accurately, taking into account hardware specifications and CPU, memory, network, and storage usage levels, including peak average metrics for CPU, memory, I/O storms, and user login and logout patterns, and recognize busy periods.

Performing a desktop assessment is an important phase for VDI transformation projects. It should not be overlooked, because it captures metrics from actual production users and machines. The assessment also detects usage patterns specific to the environment. Because standard estimates are often not suitable, this phase is critical to the design.

Following the assessment, VMware Professional Services delivered an architectural design with the data gathered, and the production environment was implemented. An initial pilot for 500 users was conducted over six months.

Business Drivers, Business Case, and Benefits

The project had a clear definition of requirements and measurements for success, which were met by an accurate architectural design and the capabilities of the Horizon platform.

 Business Drivers	 Business Case	 Business Benefits
<ul style="list-style-type: none"> • Improve ability to work any time, anywhere, and any place • Enable executive staff to access corporate applications and data with BYOD • Accelerate setting up new engineering design centers • Enable external vendors to perform their role without needing to issue devices to these users • Enable working remotely, which is not possible with current technology 	<ul style="list-style-type: none"> • Remove the need to procure, manage, and support devices outside corporate locations • Rapid provisioning of new agency staff • Enable the customer to implement a standardized Windows 7 platform • Separate duties for desktop management roles • Improve protection of company IP with external and offshore workers 	<ul style="list-style-type: none"> • Gained significant cost savings at offshore locations • Enabled local and remote CAx users to work through a zero client, eliminating need to purchase engineering workstations • Increased availability for desktops and applications • Rapid provisioning and reclamation • Effectively maintained and enforced standard corporate desktops • Simplified management and support by centralizing desktop infrastructure

Business Drivers

A primary goal for the end-user computing transformation is the ability to securely access desktops from any device, in any place, at any time. The ability to log in to the environment using non-corporate devices, such as iPads, agency-owned hardware, and personal computers, from any location without compromising security, not only provides users flexibility but also offers the business an effective solution for agency and remote users. Physical desktop infrastructure challenges and issues around logistics, support, and licensing were either simplified or no longer a concern.

The company must be able to start up new engineering design centers, for the research and development of vehicle technologies, at remote locations. Previously, waiting for IT to set up the infrastructure at these sites to support the desktop environment usually was hampered by delays, which in turn affects the business. Horizon with View requires only a minimal IT infrastructure, which has reduced the time needed to enable access to the environment from these sites.

To improve flexibility and productivity, an increasing number of staff have adopted BYOD. Executives must be able to use mobile devices, such as tablets, for business purposes. Horizon with View supports this initiative with the Horizon Client. However, with its physical desktop infrastructure, the customer did not have remote and flexible working capabilities, so users could not be as productive when traveling or visiting different sites. This limitation was one of the main drivers for the project, hence its slogan “Anytime, Anywhere, Any Place.”

Business Case

The car manufacturer engages with a large number of third-party vendors in their Agency and Purchased Services division, which historically has been logistically challenging and expensive to support. One reason is that the company had to supply devices to these users to enable them to work on the corporate network and environment, and procuring and provisioning the devices took a long time to complete. The Horizon with View VDI solution offers a more efficient, faster, and cost-effective provisioning model than traditional physical desktops.

Microsoft support for Windows XP ended on April 8, 2014. It was critical for the company to implement a standardized Windows 7 desktop. Because internal and external users are geographically dispersed, it would be extremely difficult, time consuming, and resource intensive to migrate physical desktops from Windows XP to Windows 7. The Horizon solution delivered a standardized and secure Windows 7 desktop platform, solving the problem of migrating to Windows 7.

Data security is of the utmost importance for the highly competitive automobile industry. Many third-party suppliers used physical desktops, making the audit and control of data difficult to track. The Horizon with View solution's centralized infrastructure enables intellectual property and data to be securely stored in the data centers. Client access devices do not contain intellectual property or data as they are used only to connect to the corporate environment.

Business Benefits

The centralized infrastructure consolidates licensing costs. The company no longer needs to negotiate and acquire licenses from regional suppliers at offshore locations. It can also audit and document the application licenses, helping to ensure compliance and curtail unnecessary spending. Other cost savings come from being able to keep the number of different devices to a bare minimum. Managing and supporting the desktop infrastructure is now performed centrally, reducing the need for a regional support workforce and resulting in significant cost savings at offshore locations.

Managing and supporting desktops has always been challenging, especially with external third-party vendors. Activities such as replacing broken hardware or sending support engineers offsite had slow turnaround times and were costly. The company had tried to improve the management and support of the physical desktops but was unsuccessful because they were dispersed outside of corporate sites. Horizon enables the company to move away from the physical model and provide a centralized desktop infrastructure that simplifies management and support by hosting the desktops in two data centers. Horizon also removes the need to procure devices for external vendors and sending support engineers offsite.

Although CAx users require high-powered physical workstations, Horizon provides the capability to manage and support these users as part of the VDI. CAx users now access their physical workstations, which are held at the data centers, via the same zero clients as all other users, and their sessions are brokered by the same connection servers. This approach centralizes the workstations, and they no longer need to be delivered to user locations.

Provisioning and decommissioning desktop-related devices has always been time consuming and costly. After a project was approved with a supplier and ready to go, the users would have to then wait, sometimes weeks, to procure desktops. With Horizon, the turnaround time for granting new users—either internal or external—access to a desktop can be accomplished within minutes rather than weeks. Decommissioning desktops is also a concern. Although decommissioning does not affect productivity and deliverables, it is necessary that it occur in a timely manner to keep data secure. Previously, it was necessary to arrange transportation to physically return devices to corporate sites. With Horizon, the user's access is simply revoked.

Project Overview

The car manufacturer recognized that it needed to change the way it delivered desktops to achieve agility, flexibility, and control of its environment. About half the users are external, and it has become difficult and expensive for the company to manage and support them.

The company initiated the desktop virtualization project by evaluating different technologies and the end-to-end solution. They chose VMware Horizon because of its product capabilities and the VMware technology road map.

A PoT was set up with 500 users for testing and evaluation. Based on the initial success, VMware Professional Services was engaged to deliver the Horizon architecture and design.

VMware Professional Services

VMware Professional Services follows a standardized consulting and architecture framework to deliver an appropriate VMware implementation.

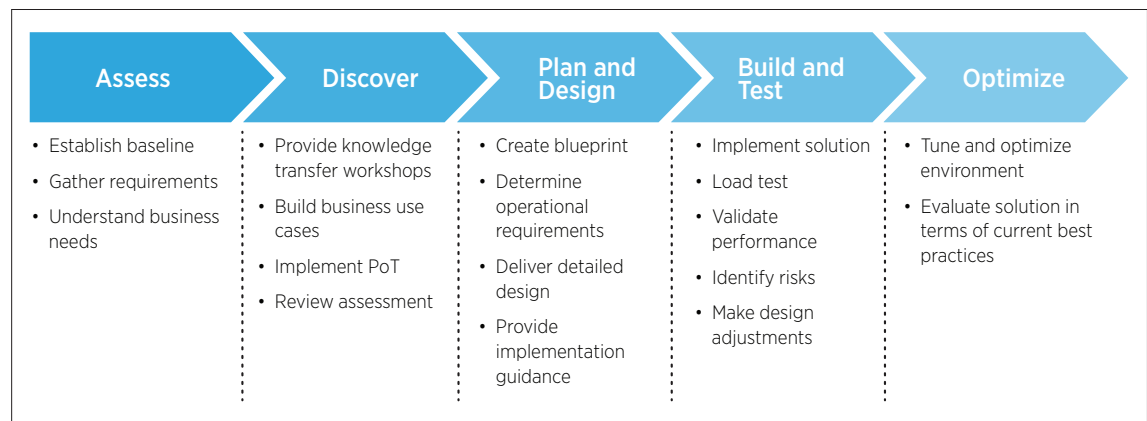


Figure 2: VMware Professional Services Consulting and Architectural Framework

A successful PoT led the car manufacturer to engage VMware Professional Services Organization to provide guidance and assistance in making technical decisions for the VDI. VMware Professional Services delivered the Horizon solution design and the subject matter expertise through the various project phases.

As part of the Assess phase, the performance and usage metrics of the actual physical desktops were evaluated as a basis for the design, rather than using standard industry estimates. This approach provides a more accurate measurement of the requirements and necessary hardware to support the virtual desktop solution.

After the design was implemented, VMware Professional Services performed load testing with VMware View Planner, which simulates multiple desktop workloads using a mixture of commonly used applications, such as Microsoft Office, Internet Explorer, Adobe Reader, and WinZip. The testing was successful, with results showing that a fully loaded environment was capable of delivering the user experience required.

The full production environment was then delivered and piloted with 500 users. With the success of the pilot, all users were migrated to the solution.

Pilot Phase

The purpose of the pilot phase is to test the user experience, functionality, and integration in the environment. The testers performed their daily tasks using a View desktop session rather than their normal physical desktop. Throughout the pilot phase, the testers provided feedback, which was used to fine-tune the system and resolve issues.

Two-Year Project

The original design and implementation was based on VMware View 5.1 with VMware Horizon Application Manager™ 1.5. VMware Professional Services helped the car manufacturer upgrade to VMware View 5.3 and replace Horizon Application Manager with VMware Horizon Workspace 1.8 so that the company could stay current and in-step with the Horizon release cycle. Updating to the latest version also provided improvements in many areas, such as

- Hardware-accelerated 3D graphics
- Easy connection to a desktop from any device with HTML access
- Enhanced productivity from mobile devices with Unity Touch
- Improved View Administrator performance

Lessons Learned

With dispersed geographical locations, regional project teams, and multiple third-party suppliers, introducing new technologies and centralizing and consolidating management and support had its challenges.



Challenges

- Lots of negative press, much not related to VDI
- Incorrect assumption that current network environment was optimized
- User expectations not managed
- Pilot users not given enough guidance and left on their own to figure out the virtual environment
- Licensing support agreements and processes needed to be changed to meet different licensing model
- Missing clear and well-communicated program strategy
- Managing multiple third-party suppliers
- No clear understanding of business requirements
- Initial project approach incorrect



Lessons Learned

- Have a VMware SME at project initiation to establish a vision of the platform and technology and address expectations
- Allow for cost transparency so that desktops are tracked to customers
- Understand the company network infrastructure, especially, in this case, with network latency variance between data centers and user sites
- Ensure that the core project teams have the relevant skills sets

At the time of the migration, the company was outsourcing the operation and support of the VDI to a third-party supplier. It is important that all suppliers are capable of operating and supporting any new technologies introduced. In this case, the support vendor streamlined the standard operating procedures to efficiently support the Horizon environment and highlight gaps in expertise required from early on.

When introducing a new technology, many issues arise for users because of misunderstandings about the technology and lack of education, which generates negative press. Usually VDI is blamed whether the issue is related to it or not. The company experienced this early on in the project and recognized that it was necessary to provide good communication, education, and management of user expectations to avoid further negative impressions of the project.

Desktop virtualization changes the way that operating systems and software are licensed. Understanding vendor license models is important and must be planned ahead of time to ensure compliance. With a centralized desktop infrastructure, the Windows operating system is licensed and managed within the data center, but the Windows Virtual Desktop Access (VDA) licenses must also be procured at regional sites. Application licenses must also be reviewed, especially when virtualized.

As a car manufacturer, the company has a complex network topology with multiple third parties and different MPLS suppliers. Assumptions were made about network configuration and optimization. Issues related to the network configuration arose, causing project delays and requiring additional resources to investigate the problems. Having a full understanding of end-to-end network topology and subject matter expertise would have avoided incorrect assumptions made early on in this project.

The absence of a subject matter expert on desktop virtualization resulted in a gap in understanding the technology. Moreover, the company's systems integration partner did not have knowledge about the environment, which led to confusion and misunderstanding with the initial project approach. After identifying this gap, the company employed a VMware subject matter expert to interface with VMware Professional Services to help make correct decisions. The technical staff has also received training to understand the capabilities of the technology and be able to define, review, and implement appropriate processes and procedures.

Architecture

The high-level overview of the Horizon design consists of the following:

- vSphere as the basis of the design, which includes View, Workspace, and ThinApp
- Support for up to 2,100 named users (2,000 virtual and 100 brokered physical workstations)
- Two active data centers with two Gigabit Ethernet (10GbE) network links between the two sites
- Separate Workspace and View instances in each data center
- ThinApp packaged applications streamed to the virtual desktop using the Workspace application catalog
- Scalable design requiring minimal effort for increasing to 20,000 desktops

The following figure shows how the View design architecture scales to 10,000 desktops in each View instance (referred to as a pod). The View pods are deployed in two data centers, with each pod consisting of various components, including VMware ESXi™ clusters, View, Workspace, and ThinApp packaged applications.

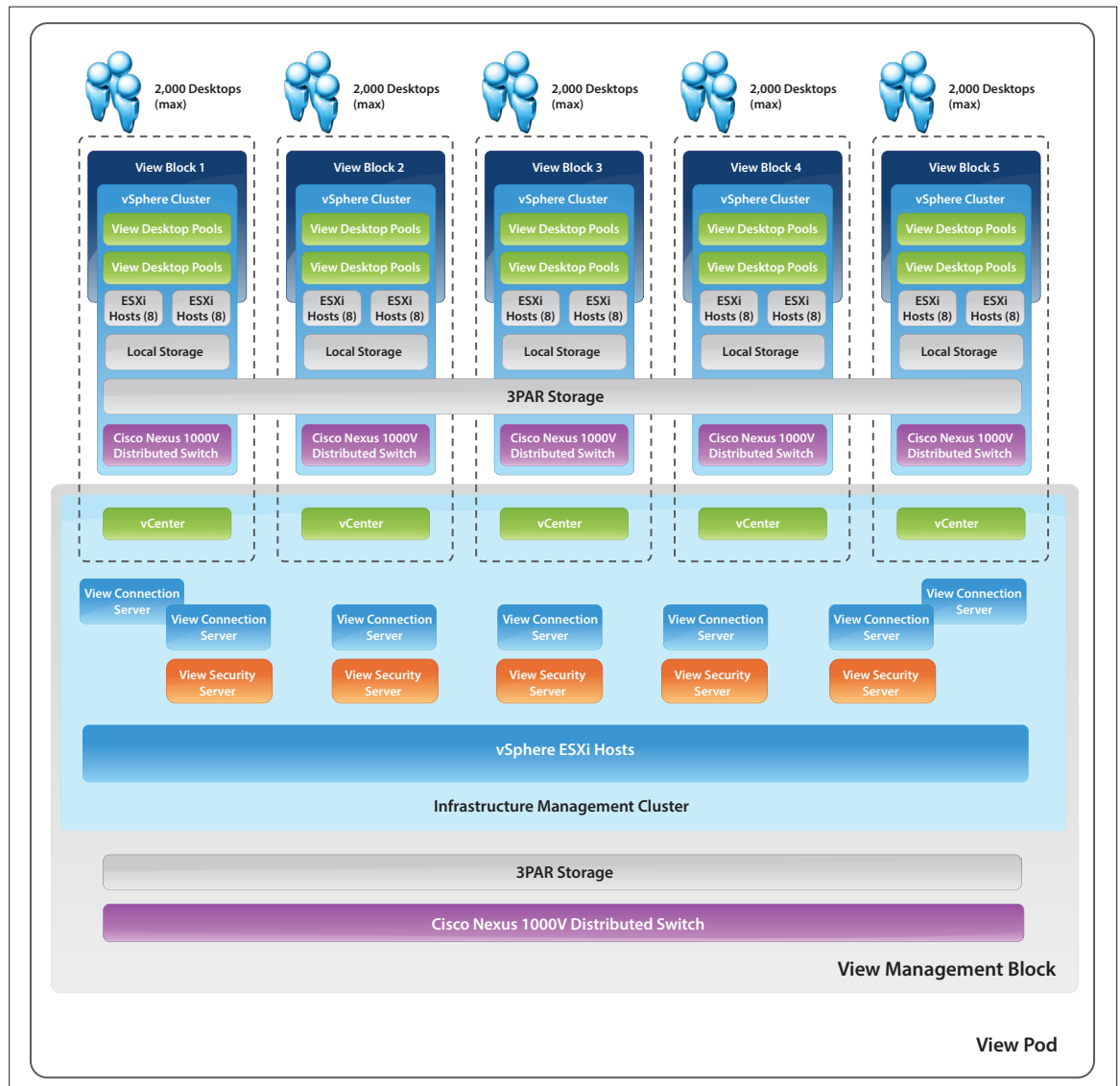


Figure 3: View Design Architecture with 10,000 Desktops per Pod

View Block Design

View blocks provide a scalable and modular architecture that facilitates standardization, expansion, and ease of management. You can add View blocks with no impact to the View environment.

This design uses two types of View blocks:

- Management block
- Desktop block

The servers that manage the Horizon with View infrastructure reside in the management block. The management block is also used to host supporting server virtual machines.

The View management block has the following components:

- VMware vCenter Server™ – Supports the management block and the Horizon with View environment.
- VMware View Composer™ – Dedicated server that enables using linked-clone virtual desktops.
- Microsoft SQL database – Required for VMware vCenter™, VMware vSphere Update Manager™, View Composer, and View events in each View pod.
- vSphere cluster – All management virtual machines are contained in one cluster with vSphere Distributed Resource Scheduler™ and VMware vSphere High Availability.
- Workspace – Workspace has two virtual appliances: the Connector and the Service virtual appliances.
- View Connection Servers – Four View Connection Servers per View pod. Two are paired with View security servers and two used for internal connections.
- View security servers – Two View security servers facilitate suppliers accessing the environment from the supplier extranets.

Each user is entitled to log in to a virtual desktop from one of the two data centers. Connectivity is provided via a load-balanced URL associated with the View pod in the assigned data center. Load balancing is performed using Cisco ACE load balancers that distribute the load between each View Connection Server in the View pod.

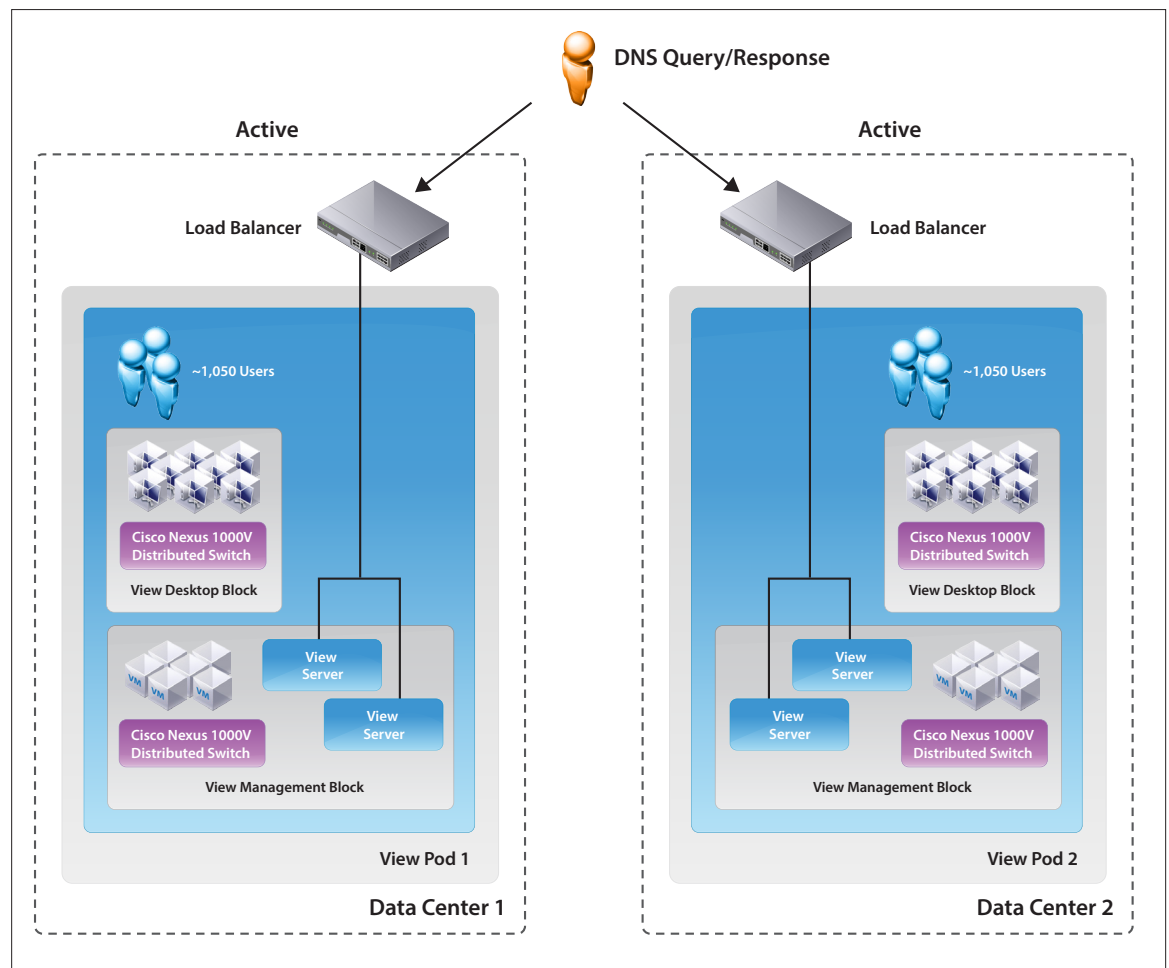


Figure 4: Logical View Multi-Site Deployment

A user can connect directly from a client access device to the View Connection Server when on the intranet (including VPN). Connections to virtual desktops originating from supplier extranet networks use a View security server, which provides secure access with PC over IP (PCoIP).

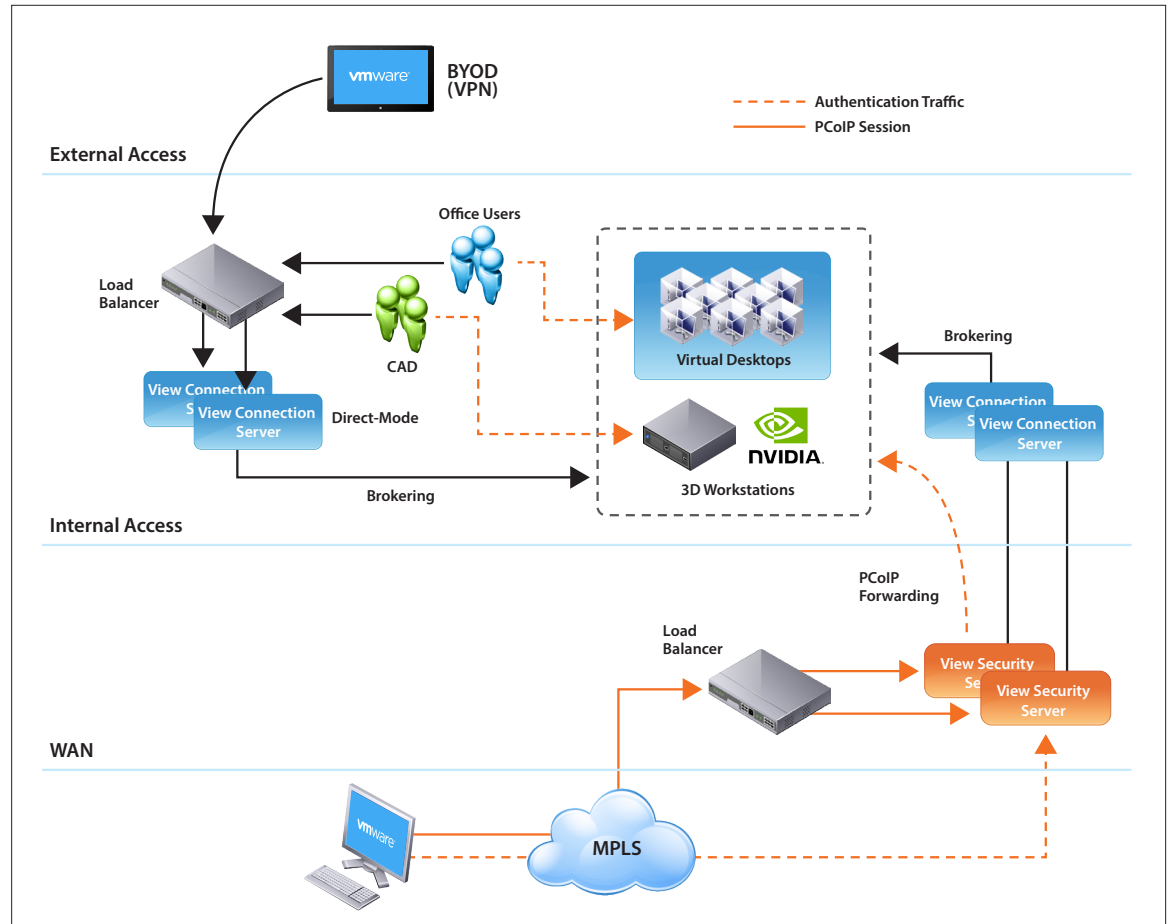


Figure 5: Global Car Manufacturer Network Topology

VMware Workspace

Workspace is the mechanism for delivering ThinApp application packages to virtual desktops. A separate Workspace instance, which logically resides in the View pod, is implemented at each data center.

The VMware Horizon Connector™ appliance connects to the ThinApp repository, which is a Windows file share hosted by a Windows file server cluster. Horizon reads the metadata for those applications and publishes the information in the Horizon application catalog, so that those applications can be provisioned to entitled end users in the organization.

When a user logs in to the virtual desktop and authenticates with Active Directory, the Horizon Agent connects to Workspace and identifies to which applications the end user is entitled. When the user clicks the application, ThinApp streams from the ThinApp file share.

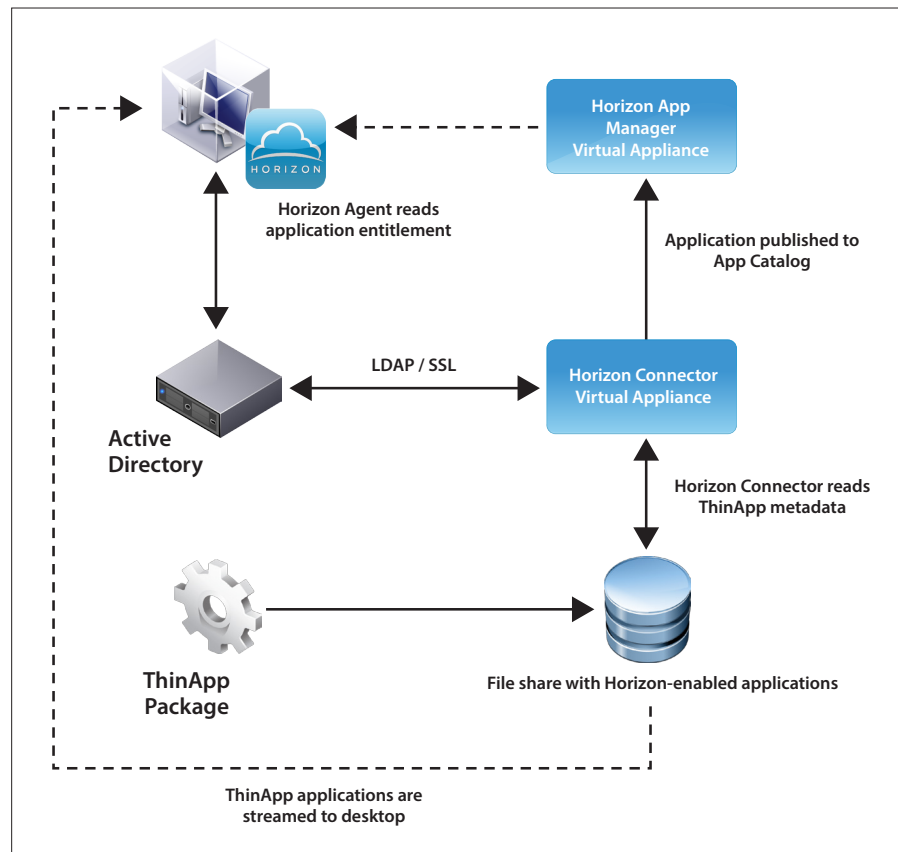


Figure 6: Workspace ThinApp Delivery

VMware ThinApp

ThinApp is used to package applications. It executes, captures, and builds activities for virtual machines. At this global car manufacturer, application capture is performed on Windows XP because it is currently the organization's oldest operating system in use. In some instances, it is necessary to perform the application capture using Windows 7. Applications that cannot be packaged and delivered with ThinApp are included as part of the base Windows build (master image).

Application desktop shortcuts are configured as part of the ThinApp package (**package.ini**). The Horizon Agent invokes **Thinreg.exe**, which places a shortcut to the application location. When the user launches the application from the desktop shortcut, it is streamed to the client from the network share.

The primary access point is a Windows file share, which is read only and controlled through NTFS file-share permissions. In addition, an existing file-share infrastructure can be used to stream applications from a network share, if the need arises. Horizon with View endpoints can stream applications on demand directly from this centralized repository.

Resiliency, Business Continuity, and Disaster Recovery

To ensure against total failures, the design distributes users over two data centers, and incorporates resiliency to prevent a single point of failure during planned or unplanned outages, for example, in situations where a host is offline due to hardware failure or scheduled maintenance.

The customer's disaster recovery requirement is either 50 percent of users back in service within four hours at full desktop performance capability or all users are working at 50 percent of performance capability. The Horizon with View design meets the following recovery point objectives (RPO) and recovery time objectives (RTO) shown in the following table.

EVENT	REQUIREMENT	DESCRIPTION
Loss of services affecting more than 100 users	RTO	1 hour
	RPO	4 hours
Loss of services affecting fewer than 100 users	RTO	4 hours
	RPO	4 hours

Table 2: Recovery Requirements

Conclusion

The car manufacturer set out to deliver the VDI project to provide a robust, flexible, and manageable desktop platform that supports its slogan “Anytime, Anywhere, and Any Place.” This project experienced success throughout its phases, and users are able to work productively in a highly available desktop environment, whether directly in offices, remotely at supplier sites, or at home or at an offsite location with an Internet connection.





Although the company encountered some challenges during delivery and implementation, the project achieved its goals and met the requirements. The company continued to work with VMware Professional Services to upgrade the environment to ensure that the solution is current.

The customer can now meet its business objectives of migrating to Windows 7 using the Horizon with View solution, which is especially important because Microsoft support for Windows XP ended on April 8, 2014.

The project has enabled CAx users to use zero clients to access brokered, high-powered workstations to perform daily activities. This was one of the major project goals and it already brings significant cost savings in terms of supporting and maintaining the remote user community of these machines.

The company now has a better understanding of its desktop application portfolio and global IT infrastructure landscape, which alone is normally an expensive exercise.

Following a successful pilot of 500 users and an environment now in production, the company can proceed with full user migration to the Horizon with View platform.

 Users	 Reduced Costs	 Productivity	 Security
<ul style="list-style-type: none"> Improved flexibility to access user desktops Turnaround time for enabling new users locally or remotely reduced from weeks to minutes 	<ul style="list-style-type: none"> Centralized desktop infrastructure and support Reduction in hardware and software setup No need to procure and deliver devices for external and remote users Desktop support for external and remote users no longer requires local support staff presence 	<ul style="list-style-type: none"> Performance desktops available, even when accessed via zero clients and remote locations Flexible working environment from within company sites or offshore locations, and with remote working and BYOD Increased agility with faster IT desktop infrastructure setup for new sites and engineering design centers 	<ul style="list-style-type: none"> Data more secure, even with a large number of external users Secure remote access with Horizon with View security servers

Horizon with View allows the company to streamline its support and operational processes to enable a smooth transition to outsource the support of its desktop infrastructure and ensure that the VDI program achieves and maintains success.

Authors and Contributors

Chi Chung Wong, End-User-Computing Architect, VMware; Ray Heffer, End-User-Computing Senior Architect, VMware; and Matt Coppinger, Senior Manager, End-User Computing, VMware, wrote this paper.

The following individuals contributed to this paper and the project by providing information relating to the project approach, architecture, design, and implementation:

- Simon Richardson
- Roger Penny
- Bruce English

To comment on this paper, contact the VMware End-User-Computing Technical Marketing team at euc_tech_content_feedback@vmware.com.

References

[VMware Horizon with View](#)

[VMware vSphere](#)

[VMware Horizon with View Technical Resources](#)

Learn More

For more information or to purchase VMware products, call 1-877-4VMWARE (outside of North America, call +1-650-427-5000), visit www.vmware.com/products, or search online for an authorized reseller.

About VMware

VMware, the global leader in virtualization and cloud infrastructure, delivers customer-proven solutions that accelerate IT by reducing complexity and enabling more flexible, agile service delivery. VMware enables enterprises to adopt a cloud model that addresses their unique business challenges. VMware's approach accelerates the transition to cloud computing while preserving existing investments and improving security and control. With more than 250,000 customers and 25,000 partners, VMware solutions help organizations of all sizes lower costs, increase business agility and ensure freedom of choice.

