

Harnessing the Combined Power of VMware Horizon Deployed on VMware Cloud on Dell EMC

AUDIENCE

This paper is intended for technology decision-makers, IT directors, and architects who are responsible for deploying and managing virtual desktop solutions in their data center or in a co-location. It is not meant to address all possible virtual desktop deployment scenarios, but rather to provide enough business value and technical detail to facilitate an informed conversation with VMware and partners when building a solution to fit specific business needs.

Introduction

When deployed together, VMware Cloud™ on Dell EMC and VMware Horizon® deliver a unique hybrid cloud solution for virtual desktops and applications where VMware takes on the burden of managing the underlying infrastructure in a customer's data center, edge, or co-location. These technologies unite the enterprise capabilities of VMware Cloud™ deployed on top of Dell EMC hardware with the market-leading capabilities of VMware Horizon for a simple, secure, and scalable solution. Customers can now focus on the business value of virtual desktops while VMware worries about the supporting physical and virtual infrastructure.

Solution overview

VMware Cloud on Dell EMC combines the simplicity and agility of the public cloud with the security and control of on-premises infrastructure delivered as a service to data center and edge locations. It is built on the latest VMware software defined data center suite, including industry-leading compute, storage, and network virtualization. This suite is optimized for and built upon Dell EMC VxRail hyperconverged infrastructure. It is easy to procure and it delivers a cloud-like consumption model. This solution provides an excellent digital foundation for customers to host and manage virtual desktops.

VMware Horizon transforms static, physical desktops into secure, digital workspaces that deliver a consistent and personalized end-user experience for knowledge workers, mobile workers and even 3D developers across devices, locations, media, and connections. Horizon ensures secure remote access to corporate resources from any personal or corporate device, while improving return-on-investment as compared to managing traditional desktop devices.

Horizon is a hybrid cloud solution that can be deployed in customer data centers and in public cloud environments. While public cloud provides a compelling home for virtual desktops, some VDI use cases must accommodate applications and data that cannot easily move out of existing data centers. This may be due to regulations, business policies, or technical constraints such as network latency. For customers who are interested in the combined benefits of a fully managed, software defined data center that hosts applications, data, and virtual desktops in a customer data center or co-location, VMware Cloud on Dell EMC and Horizon provide a unique combined solution.

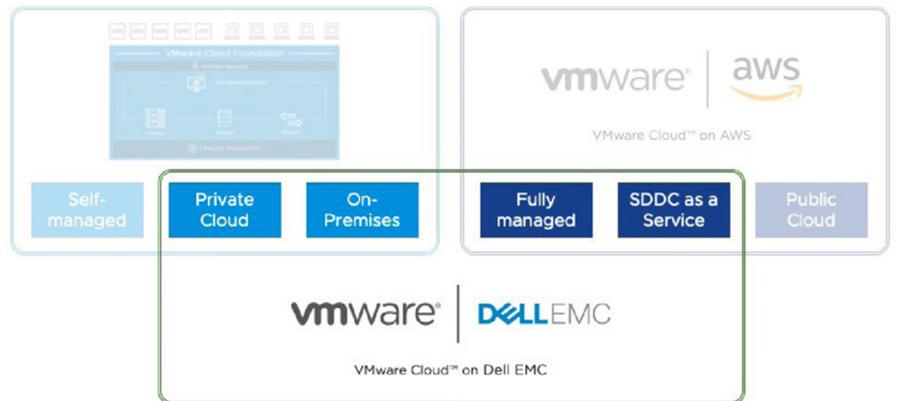


FIGURE 1. VMware Cloud on Dell EMC captures the best attributes of VMware Cloud on AWS and on-premises deployments.

Business case

Providing data and applications to users anywhere and on any device has become essential to keeping businesses, education, and healthcare running. As a result, we have seen tremendous customer demand for virtual desktop infrastructure (VDI) solutions. Successfully deploying and managing VDI depends on several fundamental requirements:

- Modernizing the underlying infrastructure
- Extending data center capacity
- Limiting the need for staff to work in the office or travel to remote locations
- Centralizing desktop management
- Rapidly provisioning and deploying desktops to both employees and contract workers

VMware Cloud on Dell EMC provides modern infrastructure, that easily expands on-premises data center capacity. It does this quickly with minimal need for on-site customer contact. VMware Horizon® provides a centralized single-pane-of-glass for deploying and managing virtual desktops to quickly get workers productive without entering the physical workplace.

Key benefits of VMware Cloud on Dell EMC

- Deliver a cloud-like experience for Horizon desktops on-premises.
- Deploy and support virtual desktop infrastructure quickly and easily.
- Provide high performance hardware for workspace density and an optimized user experience.
- Unify virtual desktop environment management through a single, centralized entitlement layer.
- Deliver enterprise-class security and compliance that is aligned to organizational requirements.
- Maintain consistent infrastructure and operations across sites.

Customer examples and use cases

VMware Cloud on Dell EMC and VMware Horizon form a joint offering that is applicable to both data center and edge locations. While not an exhaustive list, some of the most common use cases this solution addresses are:

Retail

Retail customers have distributed and often remote infrastructure locations. These locations are business critical but operate under tight margins. This presents a challenge for IT teams to install and support VDI at retail or branch locations while minimizing operational costs. The solution in this paper provides retailers with a way to deploy modern infrastructure for VDI while minimizing the need for IT staff to perform on-site deployments and ongoing maintenance. The result is a reduction in operational overhead, which gives the customer a competitive edge.

Manufacturing

Manufacturing customers have factory sites that are often located far from administrative offices to take advantage of less expensive real estate or for logistical reasons. Factory workers need access to both local and corporate applications using a wide range of endpoint devices. This solution keeps business-critical production infrastructure performing while also managing remote virtual desktop infrastructure.

Healthcare

Healthcare presents many unique IT challenges. Patient care is often an urgent matter and health services need to reach people in urban centers and rural locations. At the same time medicine is highly dependent on IT systems and endpoint infrastructure that are secure, up-to-date, and constantly monitored to maintain availability and performance. To support this essential mission, IT staff require dependable solutions like those described in this paper to provide critical tools that doctors, and nurses need so they can treat patients wherever they are.

Public sector

Public Sector provides important services to their constituents. The success of these services depends on positive citizen engagement. This mission requires robust and distributed infrastructure that supports VDI to ensure that the needs of citizens are met in their communities. All of this must be done under tight budgets and cost control. These challenges can be addressed with the solution presented here because it delivers solid, vendor managed infrastructure for VDI, in a predictable all-inclusive subscription. This means that government workers can serve the public with confidence and transparency.

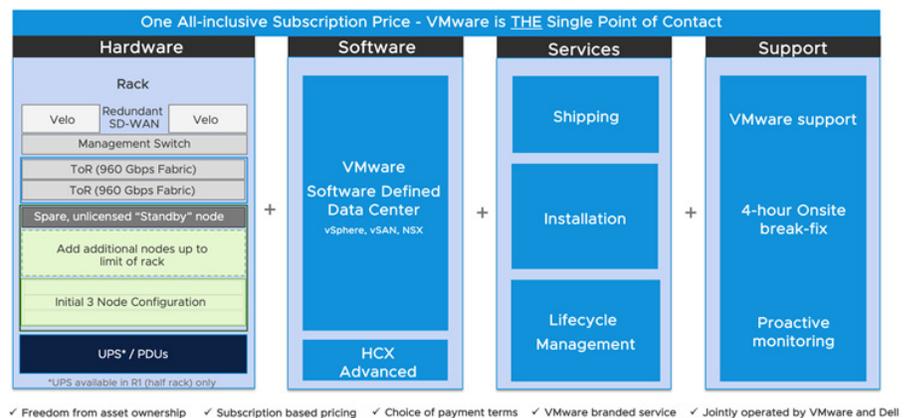


FIGURE 2. VMware Cloud on Dell EMC features

VMware Cloud on Dell EMC: What's included

Compute

VMware Cloud on Dell EMC is built on the latest Dell EMC VxRail hardware that offers high performance through modern CPUs and memory, flash storage devices, and high-speed networking. These hyperconverged infrastructure (HCI) hosts combine physical compute and storage with VMware vSphere into one integrated high-performance system which makes them ideal building blocks for virtual desktop environments. See the [data sheet](#) for host details.

Storage

The VMware Cloud on Dell EMC offering is based on hyperconverged infrastructure, which means the storage scales with the number of compute hosts in the rack. VMware vSAN all-flash datastores provide extremely high performance for a wide range of demanding workloads including VDI. The vSAN datastore is encrypted to protect customer workload data.

Networking

This combined solution provides unique security and networking benefits for virtual desktops. VMware Horizon provides a high degree of intrinsic security because VMware's VDI implementation inherently reduces the attack surface of virtual desktops. It also allows administrators to lock down desktops and prevent inadvertent or malicious user actions that are common causes of security breaches.

VMware Cloud on Dell EMC includes VMware NSX-T. This software defined networking component provides additional security for virtual desktops. Not only does NSX-T help secure North/South network traffic in the data center, it also secures East/West traffic between workloads creating a zero-trust security model. This is accomplished when micro segmentation is applied through granular firewall rules in NSX-T between VMs or workload groups. By reducing the attack surface of virtual desktops and blocking malicious code from laterally traversing between desktops Horizon and NSX-T together provide an enhanced security posture for customers.

Virtual Desktop Infrastructure

As mentioned throughout this paper Horizon can be run on top of VMware Cloud on Dell EMC to simplify the supporting digital foundation for VDI and allow customers to focus on virtual desktops instead of the underlying infrastructure. The combined solution provides enterprise-class security and support for VMware Horizon environments. It also provides superior workspace density and high performance for a great end-user experience when running the most demanding desktop applications.

A key benefit of combining VDI with this managed service is that it provides a known, prescriptive infrastructure that maintains consistency wherever it is deployed. This guaranties a level of reliability and performance of the supporting infrastructure that is difficult to maintain in most customer managed environments. This translates into a reliable desktop service and improved end-user experience.

Horizon Desktop and VMware Cloud on Dell EMC architectural overview

Horizon deployment strategies

A typical Horizon architecture design uses a pod and block strategy. A block is a single vCenter, while multiple blocks combined make a pod. A Horizon pod is a unit of organization determined by Horizon scalability limits. Each Horizon pod has a separate management portal, and so a standard design practice is to minimize the number of pods. For the purposes of this paper, we will consider a single pod architecture.

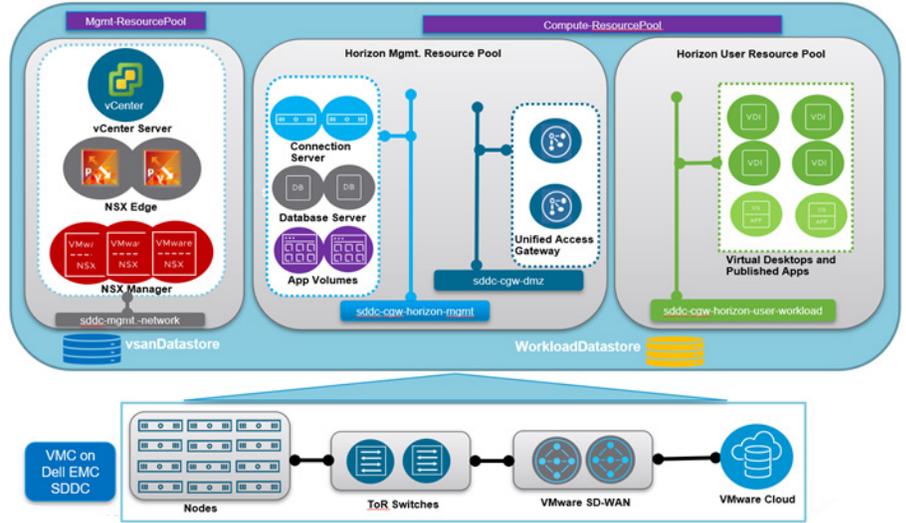


FIGURE 3. In this deployment architecture, all SDDC management components such as VMware vCenter, NSX Manager and NSX Edge are placed in a Management-Resource-Pool. All VMware Horizon management components such as Unified Access Gateways, Connection Servers, Database Servers and App Volumes are placed in a Compute Resource Pool along with Virtual Desktops and Load Balancers.

Every cloud has its own network connectivity design. Combined with VMware NSX Edge, VMware Cloud on Dell EMC presents unique requirements for deploying Horizon that are slightly different from a customer managed on-premises environment. These requirements are detailed in the [Horizon on VMware Cloud on Dell EMC Reference Architecture Paper](#).

Given that VMware Cloud on Dell EMC supports one vCenter per software defined datacenter, we recommend a deployment architecture where the Horizon Connection Servers and VMware Unified Access Gateways (UAGs) are running inside the cloud service infrastructure. This effectively turns each SDDC into a single block thereby simplifying the scalability of Horizon running on VMware Cloud on Dell EMC.

The following diagram shows a basic Horizon pod deployment in VMware Cloud on Dell EMC.

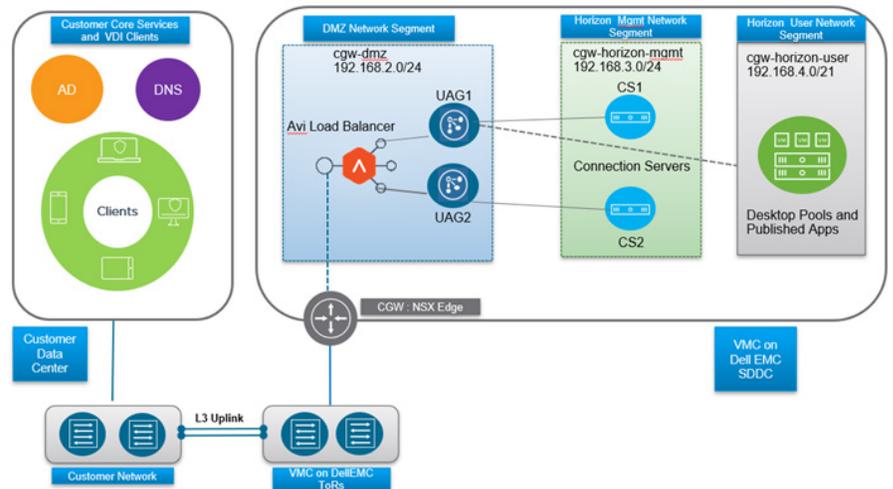


FIGURE 4. Horizon pod deployment in VMware Cloud on Dell EMC

How to size VMware Cloud on Dell EMC hosts for Horizon

Horizon's sizing methodology on a host running on VMware Cloud on Dell EMC is simpler than Horizon running in a customer installed and managed on-premises scenario. This is because the hosts, racks, and software defined data center components are always standardized and prescriptive.

Host type and desktop sizing help determine the number of hosts needed to support your VDI requirements. It is central to determining the cost-per-desktop. A single Horizon pod is the simplest deployment scenario. The number of desktop sessions a single pod can handle depends on several factors that are specific to each customer. These factors include user profiles, application workloads, and network bandwidth. The variables differ from one customer to the next. Customers should consult with their VMware end user computing sales team or partner to determine the specific performance requirements for their virtual desktop solution. Once determined a maximum concurrent desktop sizing estimate can be calculated and this will dictate the type and number of hosts that should be ordered in a rack. Once this has been calculated it is easy to add additional capacity from the [VMware Cloud Portal](#) in the future to expand the solution.

Key assumptions for this basic deployment example include:

- No existing on-premises Horizon pods will be connected to the new pod using Cloud Pod Architecture (CPA).
- Local end users will connect to their virtual desktops through the L3 uplinks.
- The Active Directory domain controller will reference the existing AD through the top of rack switch uplinks.

The information needed to size, and plan workload deployments are as follows:

- Number of concurrent desktops
- Required vCPU per desktop
- Required vRAM per desktop
- Required storage per desktop

Licensing considerations

A unique cost benefit to this solution is that customers can leverage existing 3rd party licensing agreements such as Microsoft Windows desktop operating system licensing. Because VMware Cloud on Dell EMC is deployed on-premises it is not necessary to purchase License Mobility and Software Assurance as is required when migrating desktops to a 3rd party public cloud. This can have a positive impact on a TCO/ROI calculation when considering VMware Cloud on Dell EMC vs other public cloud solutions.

For Horizon licensing, customers have the option to deploy with a new [Horizon Universal license](#). Customers with Horizon perpetual licenses should contact their VMware or partner sales representative to determine the best Horizon licensing option for VMware Cloud on Dell EMC.

Regardless of whether customers are deploying Horizon on-premises or on VMware Cloud on Dell EMC, if they are using any of the subscription licenses, they must install the Horizon Cloud Connector to enable subscription license management for Horizon. The Horizon Cloud Connector is a virtual appliance that connects a Horizon pod with Horizon Cloud Service features.

RESOURCES

To learn more about VMware Cloud on Dell EMC and Horizon Desktop, please see the following resources:

[VMware Cloud on Dell EMC website](#)

[VMware Cloud on Dell EMC Technical Overview Paper](#)

[Horizon on VMware Cloud on Dell EMC Deployment Guide](#)

[VMware Horizon Tech Zone](#)

A MyVMware account from <https://my.vmware.com> is required for a Horizon subscription license. Once the subscription license is purchased, a record will be created in the Horizon Cloud Service using the customer's MyVMware email address, and the subscription license information will be visible to the Horizon Administrator console.

As part of the subscription license fulfillment process, the customer will receive an email with a link to download the Horizon Cloud Connector as an OVA (open virtual appliance) file. The instructions in the email detail how to deploy the Cloud Connector, using the vSphere web client, alongside new or existing Horizon pods. Once deployed, the Cloud Connector is paired with a Connection Server in the Horizon pod, and this pod is connected to the Horizon Cloud Service. The Horizon Cloud Service manages the Horizon subscription license between connected Horizon pods.

Unlike the Horizon perpetual license, with a subscription license, one does not need to retrieve or manually enter a license key for Horizon product activation. However, supporting component license keys, such as the license keys for App Volumes, and others, will be delivered separately, and the administrator must manually enter them to activate the product.

To help customers, VMware has developed a [Horizon Desktop practitioner's guide](#) with reference materials that customers can leverage when deploying into a VMware Cloud on Dell EMC environment. Review the [Horizon documentation](#) for more details on enabling VMware Horizon for Subscription Licenses and Horizon Control Plane Services. Customers will need a separate Cloud Connector for each Horizon pod. Note: To use Cloud Connector or Horizon Cloud Services a subscription license is needed.

Conclusion

Business and technical drivers are fueling the demand for on-premises virtual desktop infrastructure in data centers, co-locations, branch offices, and edge locations. These drivers impact many industries and sectors from manufacturing to healthcare. VMware Cloud on Dell EMC is an on-premises, fully managed service that provides an ideal home for VMware Horizon. Together these offerings team up for a flexible and scalable VDI solution that is designed for multi and hybrid cloud scenarios like those described in this paper. Combining the two solutions provides unique benefits that remove administrative burden, simplify and reduce total cost of ownership, ensure performance and uptime, and secure virtual desktops and end-user applications.