Reference Architecture Guide

EMC END-USER COMPUTING

VMware Horizon 7.0 and VMware vSphere 6.0 with EMC Unity Storage Systems

- Provides a modern, simple, flexible solution that balances performance and cost
- Minimizes the risks associated with virtual desktop deployments
- Incorporates best practices from EMC and VMware

EMC Solutions

Abstract

This reference architecture guide describes the high-level architecture of an End-User Computing (EUC) solution for VMware Horizon and VMware vSphere enabled by EMC Unity™ storage systems.

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Reference Architecture Guide

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Executive summary

Document purpose

This document describes the reference architecture of an EMC End-User Computing (EUC) solution enabled by VMware Horizon 7.0, VMware vSphere 6.0, and EMC® Unity™ storage systems. It also describes how Unity storage systems can benefit any EUC solution.

This document is not intended to be a comprehensive guide to every aspect of this solution, but rather an overview. Refer to the *EMC End-User Computing VMware Horizon 7.0 and VMware vSphere 6.0 with EMC Unity Storage Systems Solution Guide* for additional details on solution design and implementation.

Business challenge

Employees are more mobile than ever, and they expect access to business-critical data and applications from any location and from any device, at any time. They want the flexibility to bring their own device to work, which means IT departments are increasingly investigating and supporting Bring Your Own Device (BYOD) initiatives. These initiatives add layers of complexity to safeguarding sensitive information. Deploying a virtual desktop environment is one way to protect your data.

Implementing a large-scale virtual desktop environment presents many challenges. Administrators must rapidly roll out persistent or non-persistent desktops for all users – office workers, knowledge workers, and power users – while offering an outstanding user experience as good as or better than that offered by physical desktops.

In addition to offering improved performance, a virtual desktop solution must be simple to deploy, manage, and scale. Storage is also a critical component of an effective virtual desktop solution. EMC solutions are designed to help you address the most serious IT challenges by creating solutions that are simple, efficient, and flexible. They are designed to take advantage of the many possibilities that EMC storage technology offers.

Solution purpose

The purpose of this reference architecture is to demonstrate the functionality, performance, and scalability of virtual desktops enabled by the EMC Unity storage systems with VMware Horizon 7.0 and VMware vSphere 6.0.

Solution benefits

This solution supports the successful deployment of virtual desktops on VMware Horizon 7.0, which runs on a VMware vSphere 6.0 hypervisor layer that is backed by highly available EMC Unity storage systems. This solution balances performance and cost by using EMC Unity storage systems, which offer the following features:

- Truly unified storage that is delivered through a full block and file unified environment
- A modern, simple interface using native HTML5
- Flexible Deployment Options such as Unity Flash, Unity Hybrid, and Unity VSA
- Optional I/O modules including 12 Gb serial-attached SCSI (SAS), 16 Gb Fibre Channel, and 10GbE

- Expanded file systems with 64-bit based architecture supporting up to 64 TB VMware Network File System (NFS) datastores
- Native Data Protection offering point-in-time snapshots, synchronous and asynchronous replications, and data-at-rest encryption
- VMware integration supporting VMware vSphere Storage APIs–Array Integration (VAAI) and vSphere APIs for Storage Awareness (VASA)
- Multiple management paths including Unisphere® GUI, Unisphere Command Line Interface (UEMCLI), and REST API

We value your feedback!

EMC and the authors of this document welcome your feedback on the solution and the solution documentation. Contact EMC.Solution.Feedback@emc.com with your comments.

Authors: Yeon Christie, Hui Gao, David Hartman, and Reed Tucker

Solution architecture

High-level architecture

The EMC EUC solution for VMware Horizon provides a system architecture capable of supporting up to 3,750 virtual desktops. EMC Unity storage supports deploying storage using Fibre Channel, iSCSI, or NFS protocols as needed while providing user home directories through the Common Internet File System (CIFS) protocol. Figure 1 shows the architecture of the validated solution using Unity 300, Unity 400, or Unity 600 Hybrid models.

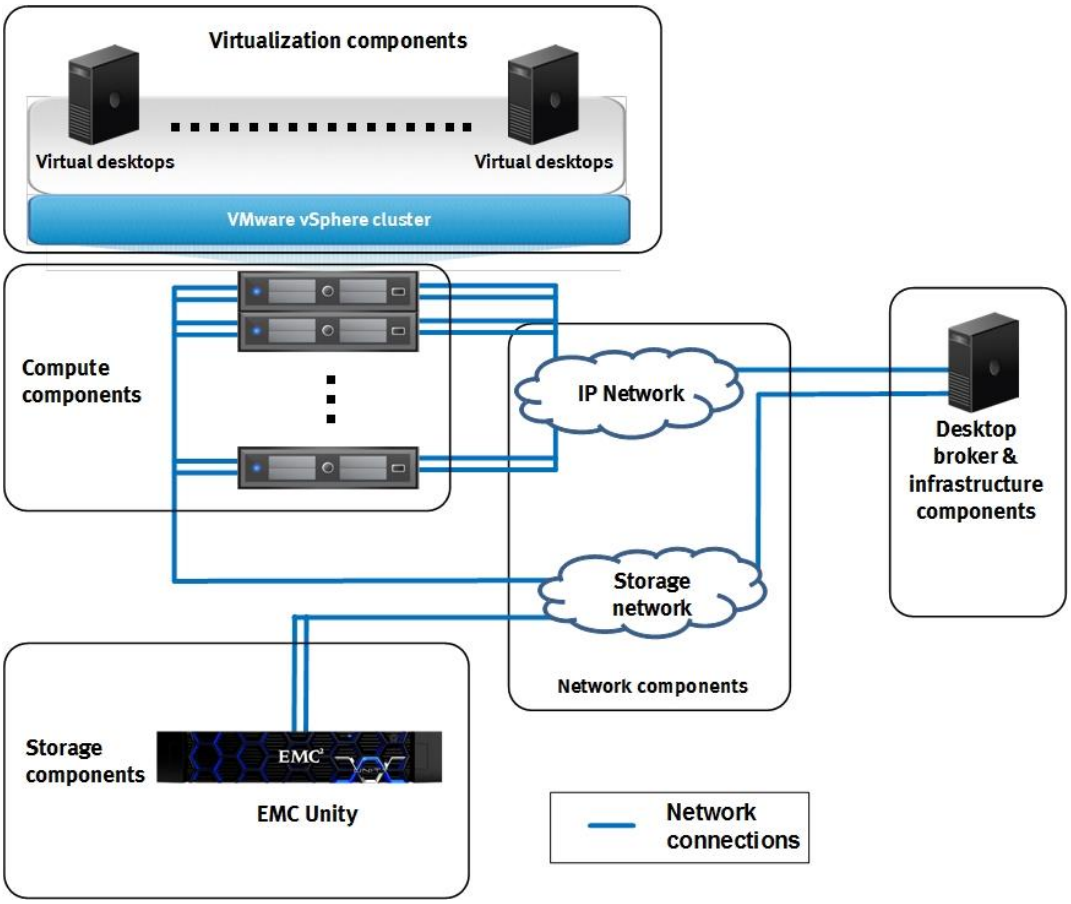

Figure 1. Architecture of the validated solution

The solution uses EMC Unity and VMware vSphere to provide the storage and virtualization platforms for a VMware Horizon environment of virtual desktops that are provisioned by VMware Horizon Composer.

Planning and designing the storage infrastructure for a Horizon environment is critical because the shared storage must be able to absorb large bursts of I/O that commonly occur throughout the day. These bursts can lead to periods of erratic and unpredictable virtual desktop performance. Users can adapt to slow performance, but unpredictable performance frustrates users and reduces efficiency.

To provide predictable performance for EUC solutions, the storage system must be able to handle the peak I/O load from the clients while keeping response times to a minimum. However, deploying large numbers of mechanical disks or an all-flash

solution to handle brief periods of extreme I/O pressure can be expensive to implement. This solution uses EMC FAST® Cache to reduce the number of disks required while leveraging the benefits of a minimal number of solid state drives (SSDs).

Key components

Overview

Table 1 outlines the key technologies used in this solution.

Table 1. Solution components

Component	Description
Desktop virtualization broker	Manages the provisioning, allocation, maintenance, and eventual removal of the virtual desktop images that are provided to users of the system. This software is critical to enable on-demand creation of desktop images, allow maintenance to the image without affecting user productivity, and prevent the environment from growing in an unconstrained way. The solution uses VMware Horizon for the desktop broker.
Virtualization layer	Allows the physical implementation of resources to be decoupled from the applications that use them. The application's view of the resources that are available is no longer directly tied to the hardware. This enables many key features in the EUC concept. This solution uses VMware vSphere for the virtualization layer.
Compute layer	Provides memory and processing resources for the virtualization layer software as well as for the applications running in the infrastructure. The EMC solution defines the minimum amount of compute layer resources required but allows the customer to implement the requirements using any server hardware that meets these requirements.
Network layer	Connects the users of the environment to the resources they need and connects the storage layer to the compute layer. The EMC solution defines the minimum number of network ports required for the solution and provides general guidance on network architecture, but allows the customer to implement the requirements using any network hardware that meets these requirements.
Storage layer	A critical resource for the implementation of the end-user computing environment, the storage layer must be able to absorb large bursts of activity as they occur without unduly affecting the user experience. This solution uses EMC Unity array with EMC FAST Cache to efficiently handle this workload.

Desktop virtualization broker

In this solution, we used VMware Horizon to provision, manage, broker, and monitor the desktop virtualization environment. VMware Horizon is a leading desktop virtualization solution that provisions virtual desktop and application delivery to end-users. For this solution validation, we deployed the Connection server, Composer,

VMware User Environment Manager (UEM), VMware Horizon agent, and VMware Horizon Client components.

Virtualization layer

VMware vSphere is an industry-leading virtualization platform. It provides flexibility and cost savings by enabling the consolidation of large, inefficient server farms into nimble, reliable infrastructures. The core VMware vSphere components are the VMware vSphere hypervisor and VMware vCenter Server for system management.

VMware vCenter Server is a centralized platform for managing vSphere environments. It provides administrators with a single interface for all aspects of monitoring, managing, and maintaining the virtual infrastructure and can be accessed from multiple devices.

VMware vCenter is also responsible for managing advanced features such as vSphere High Availability (HA), vSphere Distributed Resource Scheduler (DRS), vSphere vMotion, and vSphere Update Manager.

Compute layer

The server infrastructure must meet the following minimum requirements (refer to Table 8 and Table 9 for details):

- Sufficient CPU cores and memory to support the required number and types of virtual machines
- Sufficient network connections and bandwidth to enable redundant connectivity to the system switches
- Sufficient excess capacity to enable the environment to withstand a server failure and failover

Network layer

This solution defines minimum network requirements and provides general guidance on network architecture while allowing you to choose any network hardware that meets the requirements. If you need additional bandwidth, add network bandwidth at both the storage array and the hypervisor host to meet the requirements.

Regardless of the network traffic requirements, provide at least two physical network connections that are shared by a logical network to ensure that a single link failure does not affect the availability of the system. Design the network so that in the event of a failure, the aggregate bandwidth is sufficient to accommodate the full workload.

The network infrastructure must meet the following minimum requirements:

- Redundant network links for the hosts, switches, and storage
- Support for link aggregation
- Traffic isolation that is based on industry best practices

This solution uses virtual local area networks (VLANs) to segregate network traffic of various types to improve throughput, manageability, application separation, high availability, and security.

VLANs segregate network traffic to enable traffic of different types to move over isolated networks. In some cases, physical isolation is required for regulatory or

policy compliance reasons, but in most cases logical isolation using VLANs is sufficient.

This solution calls for a minimum of three VLANs:

- **Client access network**: Virtual machine networking and CIFS traffic (these are customer-facing networks, which can be separated if needed)
- **Storage network**: NFS/iSCSI networking (private network)
- **Management network**: vSphere management and VMware vMotion (private network)

Figure 2 shows an example of highly available network topology. It illustrates the use of redundant switches and links to ensure that no single point of failure exists in network connectivity.

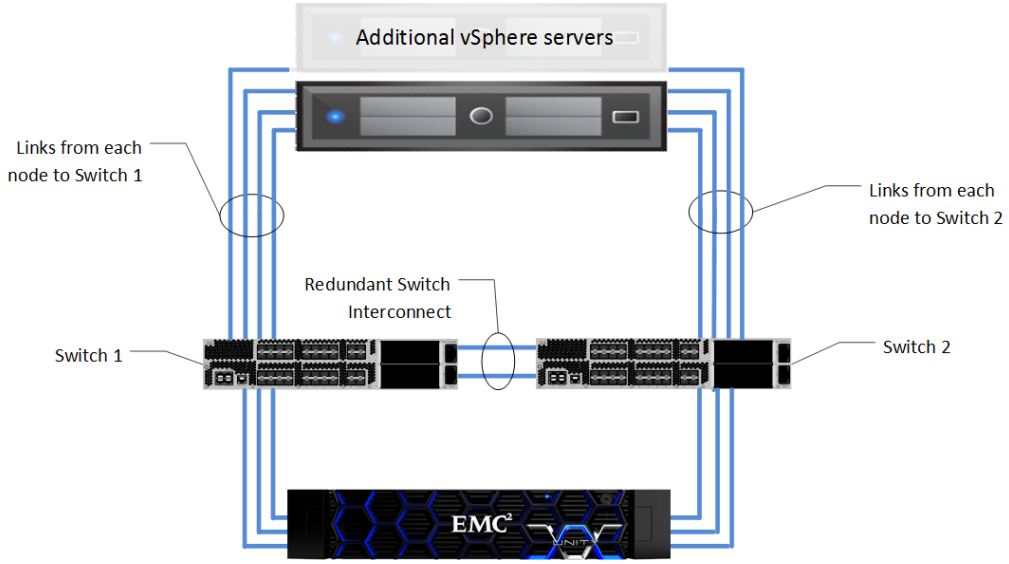

Figure 2. Highly available network architecture

Storage layer

The storage layer is a key component of any virtual desktop infrastructure solution that serves data generated by applications and operating systems in a data center storage processing system. This solution uses an EMC Unity storage array to provide virtualization integration at the storage layer. This increases storage efficiency and management flexibility, and reduces total cost of ownership. For more details about EUC benefits with EMC Unity storage systems, refer to *End-User Computing and EMC Unity: An Ideal Match*, and for virtualization integration with EMC Unity storage systems, refer to *EMC Unity: Virtualization Integration – A Detailed Overview.*

Flexible Deployment Options

With EMC Unity storage systems, a deployment offering exists for a range of different use cases and budgets, from the virtual offering of UnityVSA to the purpose-built Unity platform. The purpose-built Unity system can be configured as an All Flash system with only solid state drives, or as a Hybrid system with a mix of solid state and spinning media to deliver the best of both performance and economics.

The Unity storage system is offered in four models, with two different configurations. The platform starts with the Unity 300 model and scales up to the Unity 600 model, and can be configured as an All Flash system or as a Hybrid system. Table 2 shows the Unity model comparison.

Table 2. Unity model comparison

Model	Unity 300	Unity 400	Unity 500	Unity 600
Processor	Intel E5-2603 v3 6 cores/1.6Ghz	Intel E5-2630 v3 8 cores/2.4Ghz	Intel E5-2660 v3 10 cores/2.6Ghz	Intel E5-2680 v3 12 cores/2.5Ghz
Memory	24 GB/SP	48 GB/SP	64 GB/SP	128 GB/SP
Maximum number of drives	150	250	500	1,000
Maximum capacity (Raw)	1.5 PB	2.5 PB	3.5 PB	5.0 PB

This solution uses a building block approach to reduce complexity. A building block is a set of disks and other storage array resources such as NFS servers and datastores that can support a specific number of virtual desktops in this EMC reference architecture. We designed a small, self-contained building block so that customers can grow the system as needed.

In addition to the storage required by the infrastructure servers, storage building blocks for the virtual desktops and user data are required. A storage building block for virtual desktops contains five SAS drives. We validated up to 300 virtual desktops per building block with five SAS drives on a Unity Hybrid model. Two SSD drives were also used and configured as FAST Cache.

Table 3 shows the number of desktops that a building block can support for each type of desktop OS.

Table 3. Number of desktops that a building block can support

Virtual desktop OS	Number of desktops supported
Windows 8.1 Pro (32-bit) SP1	250
Windows 7 Enterprise (64-bit)	300
Windows 10 Enterprise (64-bit)	250

We recommend 125 virtual machines per Virtual Machine File System (VMFS) or NFS datastore and one NFS server per building block for the file variant. Create the appropriate number of NFS or VMFS datastores on each building block based on this recommendation. For more details about VMware storage limits, refer to *VMware Horizon View 6 sizing limits and recommendations*.

Figure 3 shows an example of the storage building blocks for a Windows 10 virtual desktop. It illustrates how storage is provisioned as VMware NFS datastores to VMware vSphere. Each storage building block is distributed across the storage processors and supports a single NFS server with two NFS datastores. This simple design ensures resource use is optimized and balanced.

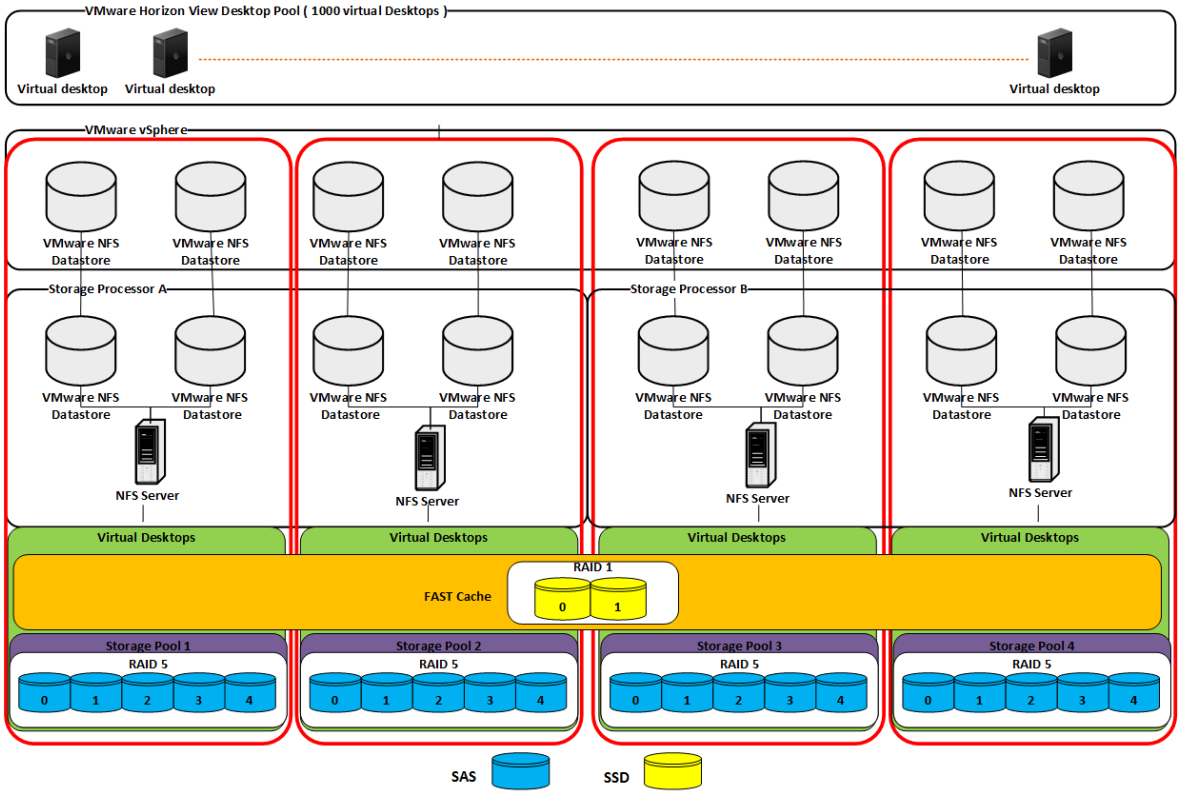

Figure 3. Storage building block for desktops

One virtual desktop building block consists of five SAS drives in a FAST Cache-enabled storage pool. You can combine multiple building blocks to support additional virtual desktops. Currently up to four virtual desktop building blocks were validated on Unity 300 storage arrays and eight virtual desktop building blocks were validated on Unity 400 storage arrays. Table 4 and Table 5 show the validated maximum virtual desktop numbers with five unique reference virtual desktop configurations on Unity 300 and Unity 400 storage arrays. Table 6 shows the expected maximum desktop counts for the Unity 500 and Unity 600 storage arrays as well. Each configuration type represents a unique combination of a virtual machine operating system and a provisioning method.

Figure 4 shows an example of the storage building blocks for user data and illustrates how users access their data and profiles using CIFS shares. The minimum requirement for one building block for user data is a CIFS share on the storage pool, which consists of eight NL-SAS drives configured as RAID 6. One building block for user data can support up to 600 users with up to 40 GB per user by using eight 4 TB NL-SAS drives in a RAID 6 configuration. This solution validated a configuration including up to four user data building blocks supporting up to 1,000 users on a Unity 300 storage array, and up to 2,400 users on a Unity 400 storage array. The Unity 500 and 600 series can scale up to 3,200 and 3,750 users respectively.

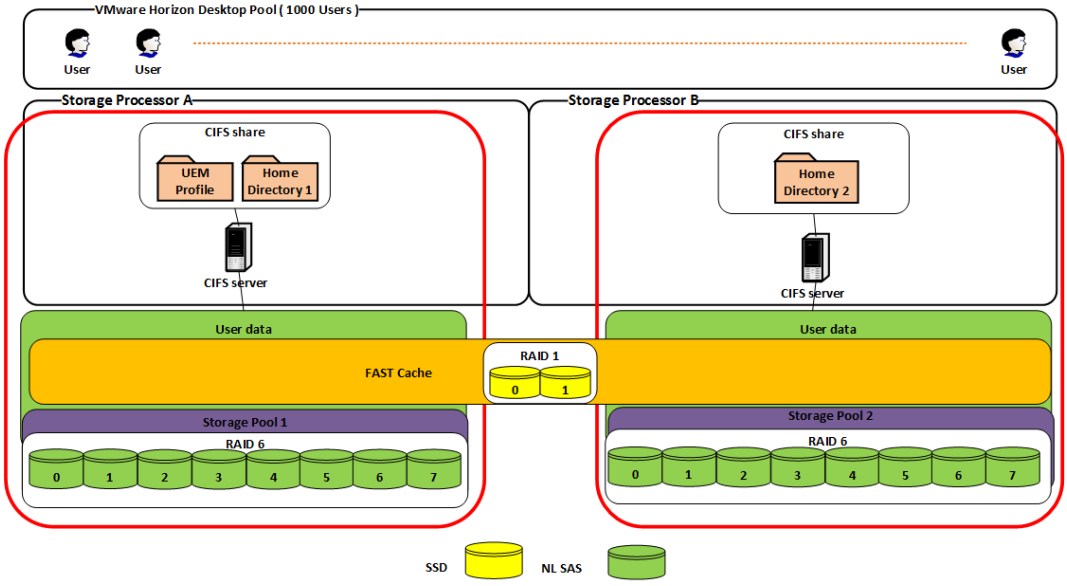

Figure 4. Storage building block for user data and home directories

Table 4. Validated maximum virtual desktops on Unity 300

Reference virtual desktop configuration	Virtual desktop OS	Login VSI workload	Provisioning method	Number of validated virtual desktops
Reference configuration 1	Windows 8.1 Pro (32-bit) SP1	Office worker	Linked clone	1,000
Reference configuration 2	Windows 10 Enterprise (64-bit)	Knowledge worker	Linked clone	700
Reference configuration 3	Windows 10 Enterprise (64-bit)	Knowledge worker	Instant clone	700

Table 5. Validated maximum virtual desktops on Unity 400

Reference virtual desktop configuration	Virtual desktop OS	Login VSI workload	Provisioning method	Number of validated virtual desktops
Reference configuration 2	Windows 10 Enterprise (64-bit)	Knowledge worker	Linked clone	2,000
Reference configuration 3	Windows 10 Enterprise (64-bit)	Knowledge worker	Instant clone	2,000
Reference configuration 4	Windows 7 (64-bit) SP1	Knowledge worker	Linked clone	2,400
Reference configuration 5	Windows 7 (64-bit) SP1	Knowledge worker	Instant clone	2,400

Virtual desktop scaling across Unity array models

Testing for this solution guide was completed first on the Unity 300 storage array. The Unity 400, 500, and 600 models have increased memory counts, faster CPUs, and increased core counts to support higher drive counts. System resource maximums were determined during testing on the Unity 300, then using the specifications for the Unity 400, we extrapolated the maximum supported desktops. We validated the assumptions during subsequent testing on the Unity 400. Using the same extrapolation model, we determined the maximum supported desktop numbers for the Unity 500 and 600 models as well. These maximums are shown for the entire Unity hybrid model line in Table 6. The virtual desktop reference configurations are defined in Table 7. Depending upon your virtual desktop deployment size, the Unity hybrid family offers a range of supported desktops to help plan for growth and size the storage platform correctly.

Table 6. Unity scaling limits

Virtual Desktop Reference Configuration #/Model	Unity 300 Maximum	Unity 400 Maximum	Unity 500 Maximum (extrapolated)	Unity 600 Maximum (extrapolated)
1	1,000	2,000 (extrapolated)	2,650	3,125
2	700	2,000		
3				
4	1,200 (extrapolated)	2,400	3,200	3,750
5				

Validated environment

Overview

We validated five different types of virtual desktop deployments on Unity. The Unity storage array provides the following options for provisioning storage to VMware ESXi hosts: NFS, Block, VVOL File, and VVOL Block. Because NFS file systems require more CPU utilization, IOPS, and memory usage than block types for handling additional metadata, this solution was validated using the NFS file system protocol. Implementations using other protocols might yield higher desktop densities.

Reference workload

For end-user computing solutions, the reference workload is defined as a single virtual desktop—the reference virtual desktop configuration—with the workload characteristics indicated in Table 7.

Table 7. Reference virtual desktop configuration characteristics

Characteristic	Reference configuration 1	Reference configuration 2	Reference configuration 3	Reference configuration 4	Reference configuration 5
Virtual desktop OS	Windows 8.1 Pro (32-bit) SP1	Windows 10 Enterprise (64-bit)	Windows 10 Enterprise (64-bit)	Windows 7 Enterprise (64-bit)	Windows 7 Enterprise (64-bit)
Virtual processors per virtual desktop	1	2	2	2	2
RAM per virtual desktop	2 GB	2 GB	2 GB	2 GB	2 GB
Virtual desktop capacity*	24 GB	32 GB	32 GB	32 GB	32 GB
Average IOPS per virtual desktop at steady state	10	15	17	10	11
Login VSI workload	Office worker	Knowledge worker	Knowledge worker	Knowledge worker	Knowledge worker
Provisioning method	Linked clone	Linked clone	Instant clone	Linked clone	Instant clone
* The available storage capacity is calculated based on drives used in this solution. You can create additional capacity by adding drives or using larger capacity drives of the same type.					

Hardware components

Table 8 describes the hardware components of the test environment built to support 1,000 virtual desktops.

Table 8. Solution hardware components for 1,000 desktops

Hardware components	Configuration	Quantity
Desktop cluster: Cisco UCS B200-M3	CPU: 24 cores @ 2.593 GHz	Cores: 304 MEM: 3TB
	MEM: 256 GB	
Desktop cluster: Cisco UCS B200-M4	CPU: 28 cores @ 2.699 GHz	
	MEM: 256 GB	
Storage array: Unity 300	CPU: 2 x 6 cores @ 1.6 GHz	1
	MEM: 2 x 24GB	
	SSD: 200 GB	3
	SAS: 1.2 TB, 10k RPM	21
	NL-SAS: 4 TB, 7.2 RPM	17

Table 9 describes the hardware components of the test environment built to support 2,000 virtual desktops.

Table 9. Solution hardware components for 2,000 desktops

Hardware components	Configuration	Quantity
Desktop cluster: Cisco UCS B200-M3	CPU: 24 cores @ 2.699 GHz	Cores: 512 MEM: 5 TB
	MEM: 256 GB	
Desktop cluster: Cisco UCS B200-M4	CPU: 28 cores @ 2.593 GHz	
	MEM: 256 GB	
Storage array: Unity 400	CPU: 2 x 8 cores @ 2.4 GHz	1
	MEM: 2 x 48GB	
	SSD: 200 GB	5
	SAS: 1.2 TB, 10k RPM	42
	NL-SAS: 4 TB, 7.2 RPM	35

Software components

Table 10 describes the software components of the test environment.

Table 10. Solution software components

Software components	Version
Unity	4.0.1
VAAI vSphere plug-in	2.0-06
VMware ESXi Server	6.0.0
VMware vCenter Server	6.0.0
VMware Horizon Connection Server	7.0.1
VMware Horizon Composer	7.0.1
VMware Horizon Agent	7.0.1
VMware Horizon Client	4.1.0
VMware vRealize Operations Manager	6.1.0
Login VSI	4.1.6

Conclusion

In testing this solution, we successfully deployed five configurations of virtual desktops shown in Table 7 on VMware Horizon 7.0, which runs on the VMware vSphere 6.0 virtualization layer backed by highly available EMC Unity storage arrays.

Table 11 summarizes the performance of our solution validation with 1,000 reference configuration 1 virtual desktops on Unity 300 using VMware NFS datastores.

Table 11. Test results overview with 1,000 reference configuration 1 virtual desktops

Test	Time to complete	Peak IOPS	Peak system CPU utilization	Storage latency on ESXi host
Provision desktops	105 min	14,000	76 %	Less than 15 ms
Boot storm desktops	15 min	20,000	75 %	Less than 10 ms
Logon storm using Login VSI	48 min	15,000	76 %	Less than 10 ms
Steady state using Login VSI	1 hour	10,000	62 %	Less than 10 ms

Note: CPU utilization measurements in Tables 10 to 12 are based on the average across both storage processors. IOPS are based on the combined total.

Table 12 summarizes the overall test results and shows the maximum number of three validated virtual desktop configurations tested on Unity 300.

Table 12. Virtual desktop density on Unity 300

Characteristics	Reference configuration 1	Reference configuration 2	Reference configuration 3
Virtual desktop OS	Windows 8.1 Pro (32-bit) SP1	Windows 10 Enterprise (64-bit)	Windows 10 Enterprise (64-bit)
Desktop provisioning method	Linked clones	Linked clones	Instant clones
Login VSI workload	Office worker	Knowledge worker	Knowledge worker
Average IOPS per virtual desktop at steady state	Desktop: 6 IOPS User Data: 3.5 IOPS	Desktop: 11 IOPS User Data: 3.7 IOPS	Desktop: 13 IOPS User Data: 3.7 IOPS
Virtual desktop density	1,000 virtual desktops	700 virtual desktops	700 virtual desktops
System CPU utilization percentage	Logon peak: 76% Steady: 64%	Logon peak: 87% Steady: 67% Logout/refresh peak: 66%	Logon peak: 87% Steady: 68% Logout peak: 84% Provision: 84%
File system IOPS	Peak: 15k Steady: 10k	Peak: 19k Steady: 11k	Peak: 21k Steady: 12k

Table 13 summarizes the overall test results and shows the maximum number of desktops of four different validated reference virtual desktop configurations tested on a Unity 400 storage system.

Table 13. Virtual desktop density on Unity 400

Characteristics	Reference configuration 2	Reference configuration 3	Reference configuration 4	Reference configuration 5
Virtual desktop OS	Windows 10 Enterprise (64-bit)	Windows 10 Enterprise (64-bit)	Windows 7 Enterprise (64-bit)	Windows 7 Enterprise (64-bit)
Desktop provisioning method	Linked clones	Instant clones	Linked clones	Instant clones
Login VSI workload	Knowledge worker	Knowledge worker	Knowledge worker	Knowledge worker
Average IOPS per virtual desktop at steady state	Desktop: 11 IOPS User Data: 3.8 IOPS	Desktop: 12 IOPS User Data: 3.6 IOPS	Desktop: 5.8 IOPS User Data: 4 IOPS	Desktop: 6.4 IOPS User Data: 4.6 IOPS
Virtual desktop density	2,000 virtual desktops	2,000 virtual desktops	2,400 virtual desktops	2,400 virtual desktops
System CPU utilization percentage	Logon peak: 90% Steady: 69%	Logon peak: 91% Steady: 74%	Logon peak: 87% Steady: 70%	Logon peak: 80% Steady: 70%
File system IOPS	Peak: 57k Steady: 32k	Peak: 53k Steady: 35k	Peak : 46k Steady: 26k	Peak: 40k Steady: 29k

The EMC Unity 300 and 400 unified storage systems provide a solid foundation for EUC storage environments. Extensive integration with VMware technologies delivers a robust feature set that makes management and administration of Horizon environments simple and efficient. When combined with VMware Horizon 7, Unity offers a fast, modern, low-risk path to end-user computing. It supports hundreds to thousands of virtual desktops while providing an outstanding user experience to each virtual desktop user, regardless of provisioning method. The building-block approach outlined here provides linear scaling that can grow based on business needs.

VMware Horizon 7 is a compelling choice for VDI deployments, particularly when using Unity unified storage systems. EMC has tested multiple provisioning methods to make sizing a Unity unified storage system for your VDI environment simple and accurate.

Refer to the *EMC End User Computing VMware Horizon 7.0 and VMware vSphere 6.0 with EMC Unity Storage Systems Solution Guide* for more details about the solution and to review the detailed test results.

References

EMC documentation

The following documentation on EMC.com or EMC Online Support provides additional and relevant information. Access to these documents depends on your login credentials. If you do not have access to a document, contact your EMC representative.

- *EMC End-User Computing VMware Horizon 7.0 and VMware vSphere 6.0 with Unity Solution Guide*
- *EMC Unity Hybrid and Unity All Flash Installation Guide*
- *EMC Unity VSA Installation Guide*
- *EMC Unity All Flash and Unity Hybrid Hardware Information Guide*
- *EMC Unity Family Configuring VVols*
- *EMC Unity Family Configuring Pools*
- *EMC Unity Family Configuring Hosts to Access VMware Datastores*
- *EMC Unity Family Configuring Hosts to Access SMB*
- *EMC Unity Family Release Notes*
- *Introduction to the Unity Platform: A Detailed Review*

VMware documentation

The following documentation on the VMware website provides additional and relevant information:

- *VMware vSphere 6.0 Installation and Setup Guide*
- *vSphere Storage ESXi 6.0 Guide*
- *vSphere ESXi 6.0 Virtual Machine Administration*
- *vCenter Server and ESXi 6.0 Host Management*
- *Installing and Administering VMware vSphere Update Manager 6.0*
- *vSphere Resource Management ESXi 6.0*
- *View Installation VMware Horizon 6 Version 6.2*
- *View Administration VMware Horizon 6 Version 6.2*
- *View Architecture Planning VMware Horizon 6 Version 6.2*
- *View Integration VMware Horizon 6 Version 6.2*
- *User Environment Manager Administrator's Guide*

Other documentation

The following documentation on the Login VSI website provides additional and relevant information:

- *Login VSI 4 Installation*
- *Login VSI 4 Getting Started Guide*
- *Login VSI 4 Requirements*
- *Login VSI 4 Analyzing Results*