High Performance Digital Workspace Infrastructure for Omnissa Horizon

Delivering high performance virtual and physical desktop infrastructure designed and built for compute and graphically intensive desktop workload environments

CoreStation CX Platform Edition

Executive Summary

Amulet Hotkey solutions enable organizations to deploy a hybrid remote desktop environment to its employees. The ability to mix and match the different types of workloads against the diverse employee requirements and use cases is unique in the market.

Add in the client-side hardware devices serves for a complete end-to-end remote desktop solution that can fit all sizes regardless of the workload.
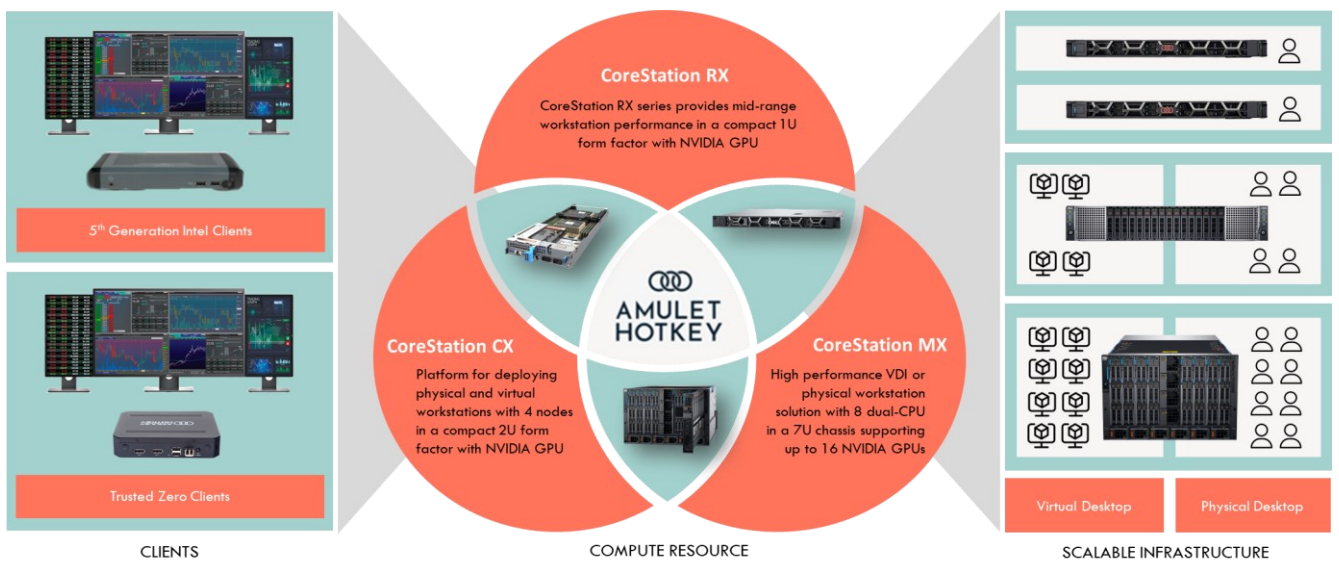
At the heart of the Amulet Hotkey infrastructure is the CoreStation range of servers. Available as a 1U rackmount or modular 2U and 7U chassis, each CoreStation compute node has been optimized for performance and density.

This is essential in delivering hardware accelerated graphics where CoreStation can support more GPU resources than any other vendor.

As CoreStation is based on server class platforms, each node can support either a physical workstation on a 1:1 end-user basis, or it can run a hypervisor enabling it to run multiple virtual desktop instances, both using the Omnissa Horizon digital workspace solution to deliver desktop compute resources.

Whichever the CoreStation platform deployed, all are optimized for hardware accelerated graphics and provide greater user density than standard off-the-shelf solutions.

Common across the entire platform is the ability to manage all CoreStation nodes remotely, regardless of form factor, from a single management console that not only makes management simple but also allows service provider partners to deploy Amulet Hotkey solutions to deliver Desktop-as-a-Service solutions.

Solution Overview

Infrastructure Platform: Amulet Hotkey CoreStation CX6620

This solutions brief is focused on delivering Omnissa Horizon based virtual desktops using the Amulet Hotkey CoreStation CX platform for hosting virtual desktop machine resources.

Amulet Hotkey CoreStation CX

CoreStation CX provides a common platform for deploying both physical and virtual workstations.

Utilizing a 2U enclosure, the CoreStation CX holds up to four nodes complete with fully redundant power and agent-free management. It supports native Windows 10, Windows 11, or Linux-based operating systems when deployed as dedicated workstations and the Broadcom VMware vSphere hypervisor platform for hosting virtual desktop infrastructure – both virtual desktop machines as well as the virtual desktop management infrastructure components.

To support graphically intensive workloads, the CoreStation CX6620 supports up to two NVIDIA Virtual GPU (vGPU) graphics cards enabling higher performance or higher workload density.

Tech Spec Headlines

COMPONENT	CONFIGURATION OPTIONS
CPU	Up to two 4th or 5th Generation Intel® Xeon® Scalable processors with up to 56 cores per CPU
Memory	Up to 5200 MT/s RDIMM memory with 16 x DDR5 DIMM slots supporting up to 4TB RAM
Storage	Up to 16 x 2.5-inch SAS/SATA/NVMe (HDD/SSD) drives max 61 TB
Graphics (GPU)	Support for up to two NVIDIA L4 Tensor Core GPU 24 GB GDDR6 memory, x16 PCIe Gen4
Networking	Intel or Broadcom OCP 3.0 network adapter supporting up to Quad Port 10/25GbE

This solutions brief will take advantage of the CoreStation CX6620 flexibility to provide blueprint high-level baseline configurations for different use cases from high-end graphically intensive workloads, to standard office task-based users, including the infrastructure to support the platform.

Solution Overview

## Software Platform: Omnissa Anywhere Workspace with Omnissa Horizon

This solutions brief focuses on delivering Omnissa Horizon virtual desktop machines using the Amulet Hotkey CoreStation CX platform as both the virtual desktop hosting platform (running the hypervisor) and as physical 1:1 workstations (bare metal desktop operating system).

Omnissa Horizon Digital Workspace Solution

With Omnissa Horizon, organizations can deliver remote virtual desktop machines, hosted apps, or connect to physical workstations (brokered or direct connect) located centrally in the data center to the workforce. The datacenter can be on-premises infrastructure or delivered from a cloud service effectively delivering desktops and applications as a managed service to both internal employees and external partners.

In terms of the end user experience, using their end point client device, end users are presented with an easy-to-use client app where they simply access their personalized virtual desktops, physical desktops, or apps. Administrators gain centralized control, efficiency, and security by having apps and data in the data center.

Core to the Omnissa Horizon solution for managing and delivering virtual desktop machines, physical desktop machines or hosted applications is the connection broker that connects end users to their resources:
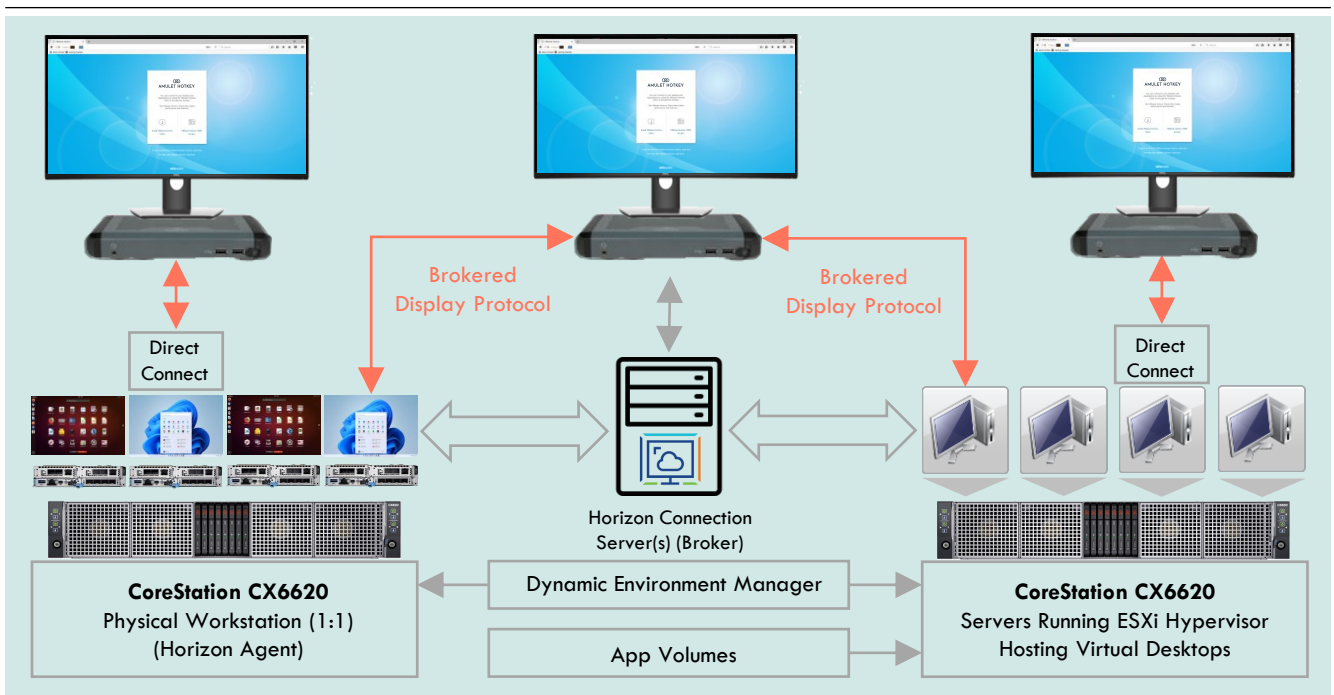
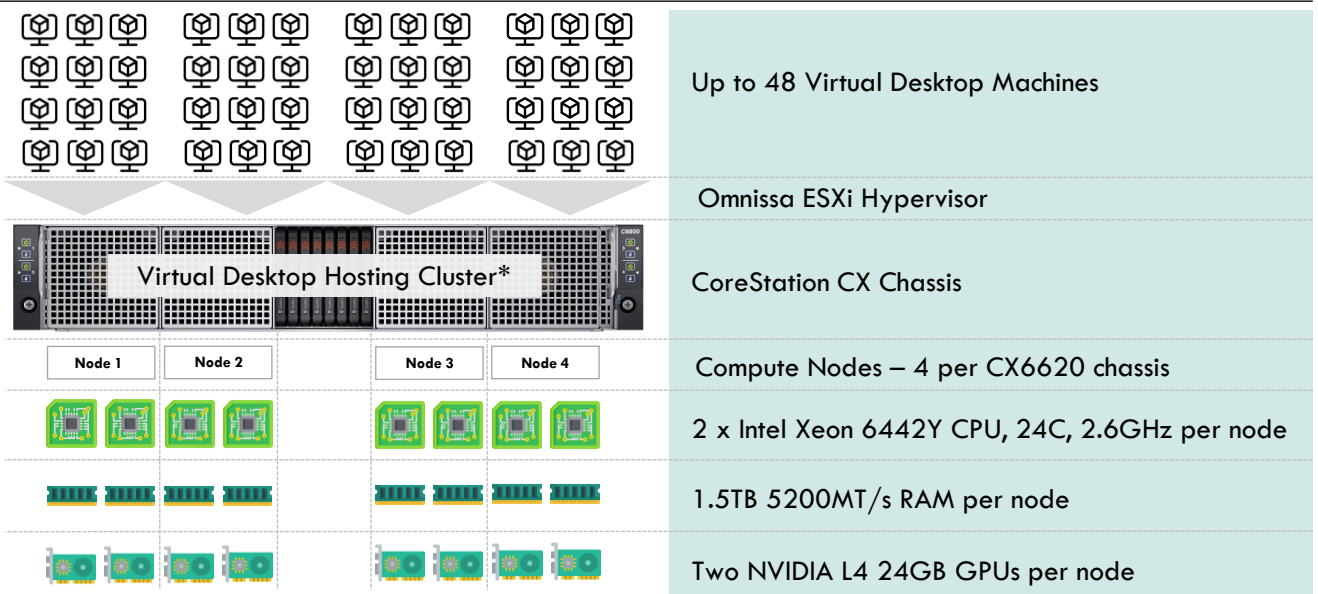| **Horizon**	**Dynamic Environment Manager**	**App Volumes**
Manages resources and connections to applications and desktops	Customizes and personalizes the end user desktop environment	Dynamically deliver applications to end users on demand

Solution Architecture

Blueprint for VDI Power Users

Power users are defined as those that require large amounts of compute resource to perform their job role. This is due to the apps being used requiring more processing power, more memory, and access to hardware-based accelerated graphics.

Architecture for Power VDI Users

This blueprint architecture for power VDI users consists of the following CoreStation CX6220 infrastructure built on a modular approach to be able support 48 VDI power users utilizing a 4GB graphics profile:

	Up to 48 Virtual Desktop Machines
	Omnissa ESXi Hypervisor
Virtual Desktop Hosting Cluster*	CoreStation CX Chassis
Node 1 / Node 2 / Node 3 / Node 4	Compute Nodes – 4 per CX6620 chassis
	2 x Intel Xeon 6442Y CPU, 24C, 2.6GHz per node
	1.5TB 5200MT/s RAM per node
	Two NVIDIA L4 24GB GPUs per node

Cluster Resources: 384 vCPUs, 6TB RAM, 192GB GPU Memory | Virtual CPU = Physical CPU (8 sockets x 24 cores) x2 with hyperthreading enabled

Modular Approach for Blocks of 48 Power VDI Users

The power user VDI blueprint in this example delivers 48 virtual desktop machines per each 2U chassis. Each virtual desktop, when resources are shared equally, delivers the following virtual hardware configuration:

Eight vCPUs, 64GB RAM, and a 4GB vGPU profile

Flexibility for CX Power Users

With the flexibility of CoreStation and Omnissa virtual desktops, this blueprint architecture for power VDI delivers flexibility and scalability to increase the virtual hardware configuration (fewer end users) or decrease the virtual hardware configuration (more end users). For example, if users requires an 8GB vGPU profile this would result in 6 users per node and 24 end users per 2U chassis. It would also mean the virtual desktop machines increase their virtual hardware configuration to an eight-core vCPU and 128GB RAM.
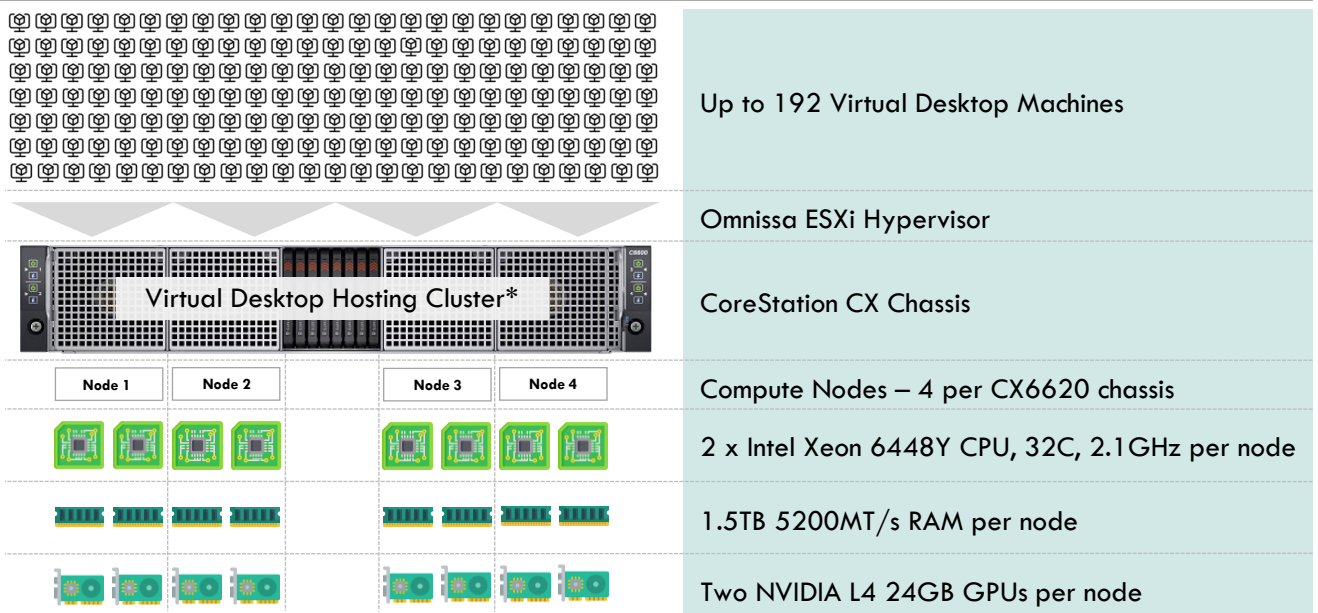
Solution Architecture

Blueprint for VDI Standard Users

Standard users are defined as users that don't require large amounts of compute resource to perform their job role. Typically, this is due to the applications being used are standard office productivity type applications which often don't support multiple CPUs or large amounts of memory.

Architecture for Standard VDI Users

This blueprint architecture for power VDI users provides consists of the following CoreStation CX6220 infrastructure built on a modular approach to be able support up to 192 VDI standard task-based end users:

	Up to 192 Virtual Desktop Machines
	Omnissa ESXi Hypervisor
Virtual Desktop Hosting Cluster*	CoreStation CX Chassis
Node 1 · Node 2 · Node 3 · Node 4	Compute Nodes – 4 per CX6620 chassis
	2 x Intel Xeon 6448Y CPU, 32C, 2.1GHz per node
	1.5TB 5200MT/s RAM per node
	Two NVIDIA L4 24GB GPUs per node

Cluster Resources: 384 vCPUs, 6TB RAM, 192GB GPU Memory | Virtual CPU = Physical CPU (8 sockets x 24 cores) x2 with hyperthreading enabled

Modular Approach for Blocks of 192 Standard VDI Users

The standard VDI blueprint in this example delivers 192 virtual desktop machines per each 2U chassis. Each virtual desktop, when resources are shared equally, delivers the following virtual hardware configuration:

Dual vCPUs, 16GB RAM, and a 1GB vGPU profile

Flexibility for Standard Users

With the flexibility of CoreStation and Omnissa virtual desktops, this blueprint architecture for power VDI delivers flexibility and scalability to increase the virtual hardware configuration (fewer end users) or decrease the virtual hardware configuration (more end users). For example, if users don't require GPU, then you can increase the total memory capacity of the hosting servers allowing you to increase the user density per node. If each user only needed a single CPU, then up to 250 users could be supported per 2U chassis .

Solution Architecture

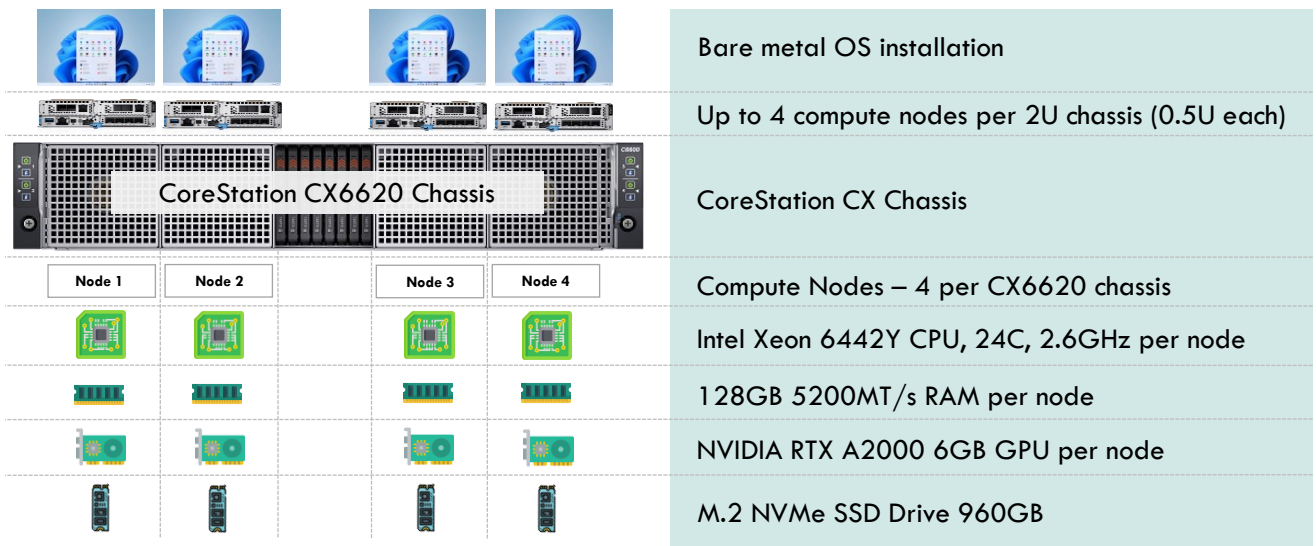## Blueprint for 1:1 Remote Physical Workstation Users

In addition to VDI environments, CoreStation CX6620 compute nodes can be used as physical workstations running a desktop OS on the bare metal rather than hosted on a hypervisor as a VM. The advantage to this approach is that infrastructure is centrally located, and centrally managed using enterprise-class management tools with desktops high-powered physical desktops being brokered using the Omnissa Horizon broker.

For users this delivers the power of a physical dedicated workstation, albeit accessed using a thin client device and for IT admins the ability to broker both physical and virtual desktops using the same solution.

Architecture for CoreStation CX6620 Physical 1:1 Users

The CoreStation CX6620 architecture for physical devices is like deploying a physical workstation, however the workstation is now located centrally and securely in the data center rather than on the user's desk.

The user connects to the workstation remotely from a client device with the workstation running the Omnissa Horizon Agent. This enables Omnissa Horizon to broker a connection from the client to the physical workstation using the display protocol to deliver the desktop experience to the client. It also enables the redirection any local devices, such as USB devices, from the client to the remote workstation.

		Bare metal OS installation
		Up to 4 compute nodes per 2U chassis (0.5U each)
CoreStation CX6620 Chassis		CoreStation CX Chassis
Node 1 Node 2 Node 3 Node 4		Compute Nodes – 4 per CX6620 chassis
		Intel Xeon 6442Y CPU, 24C, 2.6GHz per node
		128GB 5200MT/s RAM per node
		NVIDIA RTX A2000 6GB GPU per node
		M.2 NVMe SSD Drive 960GB

CoreStation CX6620 Flexibility & Scalability

CoreStation CX6620 is fully scalable to meet end user demands and requirements. Each node can be configured with a second processor to provide additional processing power, with the maximum processor configuration being able to deliver up to 56 cores for CPU.

In this configuration an NVIDIA RTX A2000 graphics card has been deployed, however this can also scale to either an RTX A4000 ADA with 20GB, a T4 with 16GB, or an L4 with 24GB.
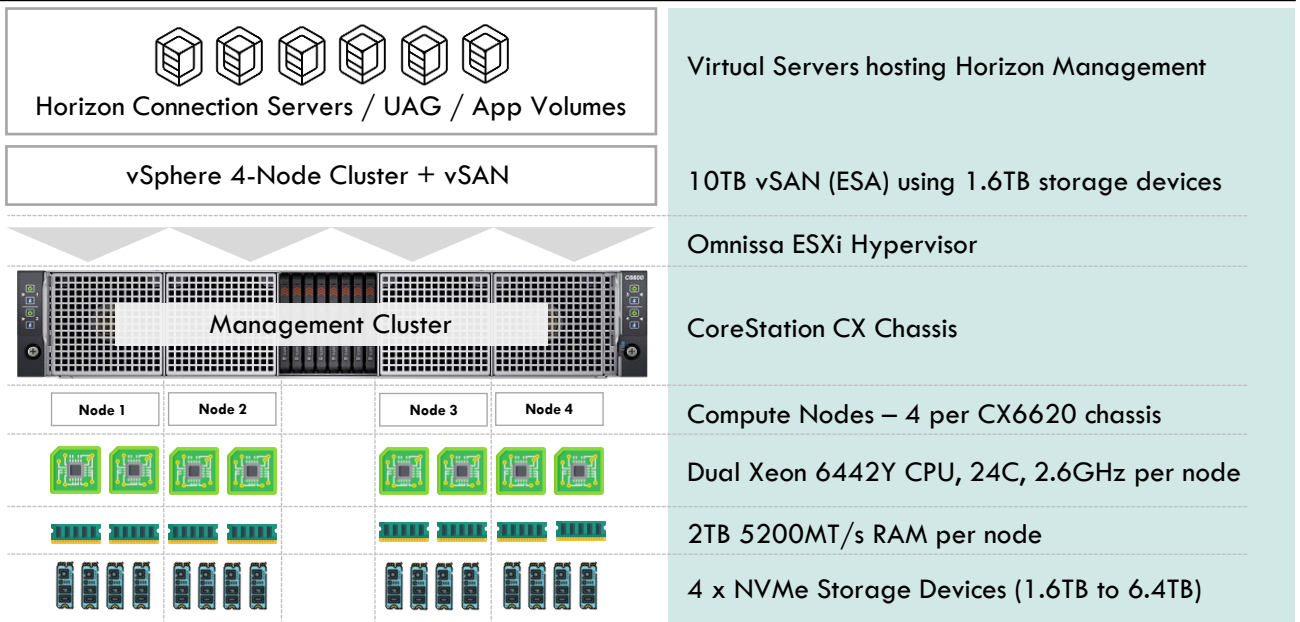
Solution Architecture

Blueprint for Omnissa Horizon VDI Management Infrastructure

To support the Omnissa Horizon infrastructure components, a management cluster is required to support the virtual server workloads such as the Connection Servers, Unified Access Gateways, and App Volumes Servers. In this blueprint vSAN is included to provide storage for the management infrastructure. vSAN will also be used for the infrastructure that is hosting the virtual desktop machines too.

Architecture for VDI Management

This blueprint architecture for the VDI management components uses the CoreStation CX6220 solution configured to deliver compute and storage resources to support the virtual management servers required to support the delivery of the virtual desktop environment to end users.

Horizon Connection Servers / UAG / App Volumes	Virtual Servers hosting Horizon Management
vSphere 4-Node Cluster + vSAN	10TB vSAN (ESA) using 1.6TB storage devices
	Omnissa ESXi Hypervisor
Management Cluster	CoreStation CX Chassis
Node 1 Node 2 Node 3 Node 4	Compute Nodes – 4 per CX6620 chassis
	Dual Xeon 6442Y CPU, 24C, 2.6GHz per node
	2TB 5200MT/s RAM per node
	4 x NVMe Storage Devices (1.6TB to 6.4TB)

Horizon Management Components

Core to Horizon is the Connection Server. The Connection Server is responsible for authenticating users, allocating virtual desktop resources based on the user entitlement, and establishing connections.

Using the Omnissa pod and block reference architecture, each pod, made up of several resource blocks hosing the virtual desktop machines, can support up to 12,000 user connections by deploying a maximum of 7 fully redundant Connection Servers per pod. Up to a maximum of 50 pods can be configured, each interconnected using the Cloud Pod Architecture topology, enabling a maximum of 250,000 end users.

Additional server workloads can be added to deliver additional functionality such as Unified Access Gateways for external access, App Volumes for dynamic application delivery, and Dynamic Environment Manager to manage the end user environment.

Solution Architecture

Flexibility and Scalability

Within this solutions brief flexibility has been key in sizing and configuring the infrastructure platforms for supporting both the virtual desktop machines as well as the management platform.

Taking a modular approach to the infrastructure enables it to be easily scaled to accommodate additional users. Adding more servers (scale out) or adding additional resources (scale up) to enable more virtual desktop machines and therefore more users to be supported. Equally the same applies to the management infrastructure resources to ensure additional users can be supported.
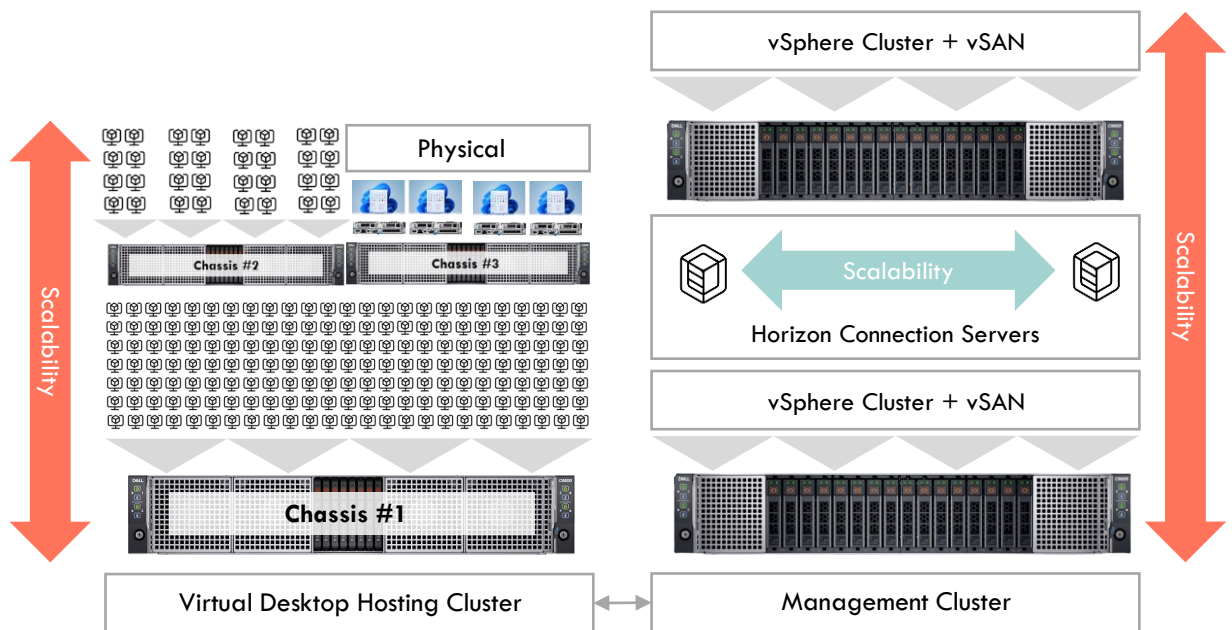
Flexibility can be achieved within the chassis itself. In the example above chassis #1 is has server nodes configured to support up to 200 standard VDI users while chassis #2 has a configuration that supports up to 50 power VDI users. Chassis #3 is configured with compute nodes configured for use on a physical 1:1 basis.

In this blueprint each CoreStation CX chassis has been fully configured with the maximum four server nodes, however with the flexibility within this solution you need only to configure the resources required. For example, you may not need all 150 standard users deployed from day one, and so you could deploy just two server nodes to support approximately 75 end users. Then, as new users are needed, a server node could simply be added to the chassis and the vSphere cluster as required.

Equally, the management cluster is sized such that more Horizon Connection Servers can be added to support the additional users as required. The same can also be said for the other management solution components such as adding more App Volumes Servers. As with the virtual desktop hosting infrastructure, additional chassis and server nodes can also be easily added should there be a requirement for additional compute resource or to increase the capacity of the vSAN storage.

Connecting Remotely from the Edge

Client Solutions for Remote Connectivity

The final piece of the solution is the device from which the end user is going to connect to their virtual desktop machine. If the device is underpowered then the end user could experience poor performance regardless of the hosting infrastructure. Therefore, it is critical to use the correct device to match the end users' use case.

The Amulet Hotkey 5th generation DX range of thin clients and trusted zero clients provide not only a range of hardware specifications to meet the end user requirements but also are agnostic when it comes to what operating system they run. This means you can also match the most suitable operating system to the use case.

High Performance Secure Thin Clients

The DX1500 and DX1700 series 5th Generation thin clients are designed to support four screens each running at 4k (3840 x 2160) and are available with up to 16GB RAM and Intel i5, Intel i3 or Intel U300 CPUs.

Trusted Zero Clients
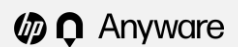
HP ∩ Anyware

Designed and built for the HP Anyware Trusted Zero Client solution, the AMD-based DXZ130 and DXZ160R support up to four screens running at 4k resolutions, plus optional SFP (copper & fiber) network connections.

DXZ130

DXZ160R

In Summary

This solutions brief has provided a high-level blueprint that serves as an example of how to approach delivering high performance virtual desktop infrastructure and remote physical workstation solutions, specifically designed and built to cater for compute and graphically intense workload environments.

In this case the compute requirements are delivered using the Amulet Hotkey CoreStation CX6620 solution as the infrastructure platform to host both the Omnissa Horizon Digital Workspace solutions as well as the physical 1:1 remote workstation capabilities. All using the same hardware platform and the same from the same hardware foundation.

Access to the desktop resources, regardless of being physical or virtual desktop based is enabled using the Amulet Hotkey client solutions as the end point device.

We have defined a modular approach that aligns with the modular approach that Omnissa adopts when deploying virtual desktops to enable desktops to be deployed securely and at scale.

Find out more

To find out more about the Amulet Hotkey CoreStation CX6620 solution, Amulet Hotkey 5th Gen thin clients, or Amulet Hotkey Trusted Zero Clients for delivering a complete end-to-end solution for high performance virtual desktop infrastructure, using the Omnissa Horizon virtual desktop solutions, click the icons below:
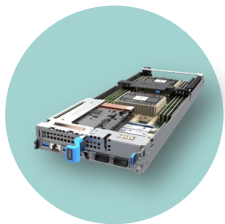
CoreStation
CX6620
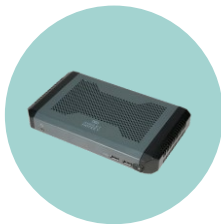
5th Gen DX
Thin Client

Trusted
Zero Client

Omnissa
Horizon

Alternatively, talk to us directly by phoning or emailing your local sales office.

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