

Why Datrium DVX is Best for VDI



■ Introduction

Managing a robust and growing virtual desktop infrastructure in current IT environments is getting more difficult for IT teams that are often supporting multiple roles. Yes, getting the right combination of computing resources – servers, storage, software– that perform well enough for today’s demanding users while still being affordable and manageable might seem overwhelming. IT organizations are faced with finding the right platform that supports the needed set of integrated and tested components, performs well, is easily managed and cost-effective, and leverage innovation and flexibility to overcome performance and cost issues.

Datrium DVX has been certified for Citrix XenDesktop and VMware Horizon View solutions. Starting as small as a single virtualization host and scaling as needed to meet the demands of business growth are easily accomplished with the Hybrid Cloud capabilities of the Datrium DVX solution. Datrium DVX can easily deploy hundreds to thousands of virtual desktops with applications included. Performance is achieved with host local flash and data handling features like zero-copy clone offload. Capacity is optimized through always-on data reduction with compression, and deduplication for greater storage efficiency.

Datrium DVX provides all the capabilities available with legacy Hyperconverged Infrastructure (HCI) platforms, such as:

- Scale-Out (Pay as You Go)
- Data Locality with Flash Performance
- Data Services (Inline Deduplication, Compression, and Erasure Coding)
- VM level Replication for Persistent Desktops

However, Datrium DVX uniquely improves and extends legacy HCI capabilities. The Datrium DVX system provides an ideal virtualization platform for building a modern data center solution for end-user computing leveraging on-premise VDI as the core building block - one of the most demanding applications when it comes to performance and user experience combined with scalability and cost.

New and Existing Servers

HCI commonly specifies the precise server brand, model, and configuration that needs to be obtained, making the rollout of virtual desktops always a Green Field initiative, with the associated costs of obtaining new hardware.

Datrium DVX does not impose hardware limitations, and new and existing servers, rack or blades, can be used as part of the deployment. Moreover, because there’s no East-West networking traffic between servers, older

hardware generations do not impact the performance of new hardware performance, unlike HCI. This approach also directly benefit the ROI and TCO of the overall solution, making VDI more accessible than ever before.

Stateful vs. Stateless

HCI protect desktops with copies of the virtual desktop data across servers, creating East-West networking traffic. Data is persistently stored across multiple servers. For large deployments, due to the high networking traffic across servers, networking may need to be updated with Spine-and-Leaf architecture.

The fundamental premise of Datrium DVX is that servers are stateless and data is not persistently stored on servers, making all the data on host flash ephemeral. A server failure doesn't generate data resiliency problems, unlike HCI.

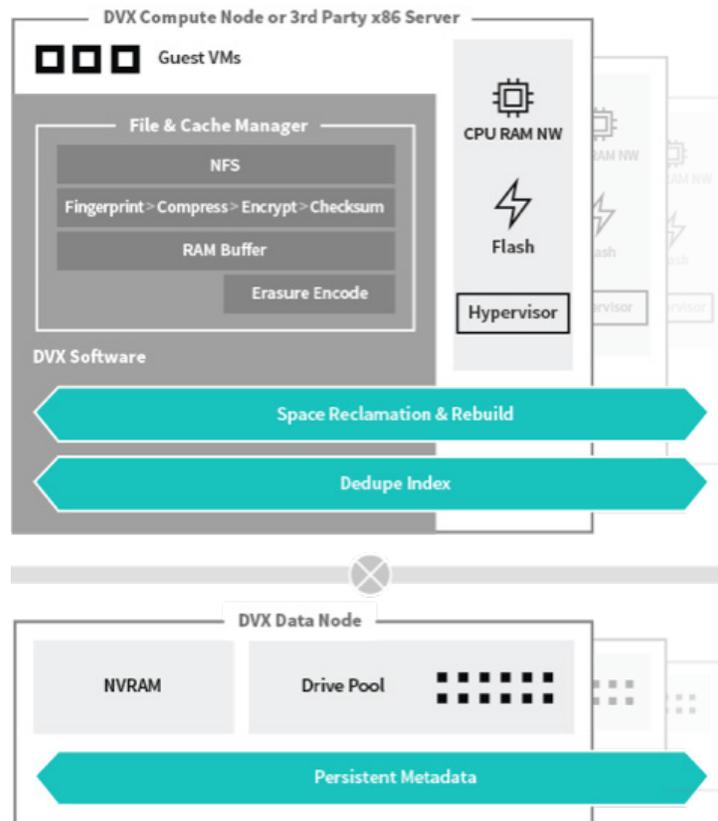
When a server fails, the required data for virtual desktops is readily uploaded to the new target host flash from a highly scalable persistent data pool. Furthermore, universal dedupe and crypto-hashing always ensure that common data across virtual desktops (Windows binaries, application files etc.) is already present on the new target host, removing the need to upload or move that data in many cases. Because all data from virtual desktops are fully de-duplicated on the persistent data pool – 1,000 virtual desktops look like a single image from a persistent storage capacity perspective.

Multi-Dimensional Growth (Performance vs. Capacity)

VDI workloads are heavy in IOPs that can be pretty much delivered by most HCI vendors using locally attached flash. However, to scale the number of virtual desktops, servers must be added to the cluster, and with new servers, additional storage capacity is added because HCI commonly specifies hardware vendors, models, and configs – generally speaking, a combination of flash and HDDs.

Unlike HCI, Datrium DVX enables capacity and performance to grow in different dimensions. If performance is needed, add a new server with a couple flash devices; meanwhile, if capacity is required, add another datanode – up to 10 datanodes and up to 1.7 petabytes of usable capacity.

It doesn't make sense to keep adding storage capacity that will never be used by the VDI solution. In some cases, a portion of this extra capacity can be used for user profiles; but is still overkill.



Non-Persistent, Floating and Instant Clones

When it comes to Non-Persistent, Floating and Instant Clones, it makes no sense to run them on servers with persistent storage with replication factors and RAID overhead.

Unlike HCI, Datrium DVX only store ephemeral data on hosts without the overhead of RAID or mirroring. Only the virtual desktop data unique across all virtual desktops on the entire deployment is then erasure coded (triple mirroring N+2 parity) to the persistent data pool.

As one may imagine, over hundreds or even thousands of virtual desktops, the data commonality is exceptionally high. This method and trait also enable drastic reduction on the amount of data being sent over the network.

Persistent Desktops

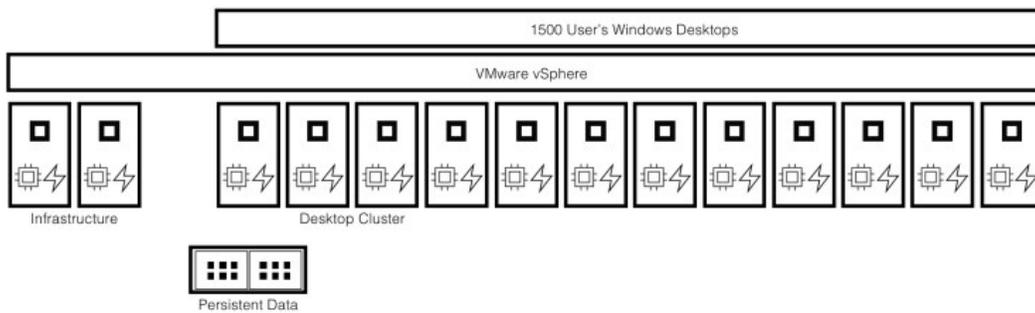
Many organizations still like to have some of their virtual desktops to be persistent across users and sessions. To be cost-effective, HCI vendors recommend that clusters be configured with two-way mirroring, instead of three-way mirroring. No serious enterprise deployment should use data protection techniques akin to RAID5.

Unlike HCI, Datrium DVX always protects virtual desktops with erasure coding (distributed three-way mirroring with N+2 parity stripes) keeping a backup (or copy) of all de-duplicated data on a scalable data pool, while the host running virtual desktops has only an ephemeral copy. Just like with the non-persistent virtual desktop model, only virtual desktop data that is unique across all virtual desktops is persistently stored in the data pool – the universal deduplication operates across hosts and the data pool.

Scalability

While HCI enabled the scale-out approach for virtual desktops solving the SAN scalability issues, most HCI vendors recommend a maximum of 16-24 hosts as part of a single cluster deployment. The outcome is significant management overhead for multiple clusters. Sometimes this management can be aggregated via a user interface that combines the deployment view, but clusters still need to be managed independently.

Datrium DVX has been externally validated by IOmark with 128 servers and 10 data nodes, providing up to 18M IOPS, 256 GB/s of random write throughput, and 1.7 petabytes of useful capacity (Deduplication and Compression are assumed here, but virtual desktops, in general, have high data avoidance and deduplication ratios). Another interesting point is that Datrium DVX will support multiple VMware vSphere clusters as part of the same Datrium domain, presenting a single namespace across VMware clusters.



Data Mobility and Protection

VDI environments typically span multiple sites that are used. Multiple sites are used to achieve a better end user experience by placing the virtual desktops closer to the end users, reducing display protocol latency. However, managing resources between sites can be extremely difficult with HCI.

Desktop Golden Images are often shared across a VDI environment. Even though Desktops Pools are created in multiple sites, these images are typically created from one or two standard Golden images. This is done to offer a common end-user experience in whichever site an end user logs into. VDI Administrators need to quickly and easily move Golden images

between multiple sites along with the Golden image Snapshots which are used to update and create new Desktop Pools. Unfortunately, this isn't a simple process with legacy HCI.

With Datrium DVX built-in Elastic Replication with Universal De-duplication a VDI Administrator is able to replicate any Virtual Machine or File that is stored on the DVX Datastore to another DVX Datastore within the VDI environment. Here are some examples of where Elastic Replication can be used to simplify the management of a multi-site VDI environment:

Golden Master Replication - A VDI Administrator updates and patches their Golden Master image in their primary data center and then replicates that same image, including all snapshots, to the other sites within the VDI environment. All Desktop Pools can then be Recomposed using the exact same image and snapshot across all sites.

AppStack Replication - VMware App Volumes AppStacks are often used in VDI environments to present virtualized applications to end-users. Similar to Golden images, AppStacks are often shared across VDI environments. Utilizing Elastic Replication, VDI Administrators can replicate their AppStacks between all sites within their VDI environment. This sounds like a straightforward process but is actually very difficult in an HCI because traditional replication engines cannot handle stand-alone .VMDK files, commonly used by VMware App Volumes.

Writable Volume Replication - VMware App Volumes Writable Volumes are used to give users a persistence experience while using non-persistent (floating) virtual desktops. Writable Volumes capture User Data, Profiles and User Installed Applications (UIA) into a .VMDK file which persists with the user. To offer a true Active/Active multi-site VDI environment, a user's Writable Volume needs to be available in whichever site that user logs into. Datrium Elastic Replication enables VDI Administrators to replicate Writable Volumes between sites ensuring a user's Writable Volume is located wherever the user happens to log into.

Not only can Elastic Replication be used for moving Golden Images and AppStacks between sites, offering global consistency, it can also be used to make sure data is available in the event of a site failure. Typically, VDI environments will use Windows File Servers and App Volumes Writable Volumes to store User Data and Profiles. Using Datrium DVX native Snapshots, and Elastic Replication, VDI Administrators can offer end-users with Recovery Point Objective (RPO) for their Data and Profiles as low as 5 minutes.

ROI Advantage

Datrium DVX offers IT organizations the opportunity to drive revenues 5x faster, to reduce the time spent managing infrastructure by as much as

95%, and to reduce infrastructure spend by up to 75% or more. To achieve these benefits, Datrium has evolved the server-powered, 1-tier model of hyperconvergence to attain scalable data consolidation, including flexible, low-latency performance, resilience for mission-critical mixed workloads, mixed server environments and converged backup across prem and cloud. Datrium customers commonly achieve a return on investment (ROI) in a matter of months, after increasing their application performance 5X while reducing their investment by 75%.

Conclusion

Where most VDI deployments are challenged by the complexity that comes with brittle, expensive array-based infrastructure, traditional hyperconvergence has failed to deliver an answer for massive consolidation, low latency workloads, and built-in backup on-prem and to cloud. Datrium DVX provides ultimate flexibility and performance for virtual desktops, handling the most demanding applications, and boot & login storms as it scales from a few hundred desktops to thousands, all while maintaining compelling economics with a high return on investment.