
Why Automatrix is Best for VDI



WHITEPAPER



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Introduction

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

Datrium DVX is a core component of the Automatrix platform, and DVX is certified for Citrix XenDesktop and VMware Horizon View. With the hybrid cloud capabilities of Automatrix, you can start with a single virtualization Host and scale as needed to meet the demands of your business growth easily. DVX accelerates the deployment of virtual desktops, including applications. Performance is maximized with Host local flash and data handling features, including zero-copy clone offload. Capacity is optimized through always-on data reduction with compression and deduplication for greater storage efficiency. Desktop data and infrastructure components are highly available using DVX built-in backup, Datrium ControlShift, and Datrium DRaaS with VMware Cloud on AWS for instant recovery from ransomware and natural disasters.

Whether you use a second site or the cloud as your disaster recovery (DR) site, Automatrix delivers failproof DR with one-click failover and failback. You get instant RTO and RPO of a few minutes, so your critical data restarts quickly, and the business impact is minimal. Costs are 10x lower using on-demand DRaaS with VMware Cloud on AWS and failback because it only sends changed data after global deduplication.

DVX Features

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

- 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, DVX uniquely improves and extends HCI capabilities. It provides an ideal virtualization platform for building a modern data center solution that supports end-user computing.

New and Existing Servers

HCI commonly specifies the precise server brand, model, and configuration that must be purchased. That requirement forces IT groups to roll out virtual desktops as greenfield initiatives, which increases costs. DVX doesn’t impose hardware limitations, so new and existing servers, racks, or blades can be used as part of the deployment. Plus, because there’s no east-west networking traffic between servers, older hardware generations don’t impact new hardware performance, unlike HCI. This approach also directly improves the ROI and TCO of the overall solution, making VDI more accessible than ever before.

Stateful vs. Stateless

The fundamental premise of DVX is that servers are stateless, and data is not persistently stored on servers, making all the data ephemeral on Host flash. Unlike HCI, a server failure doesn’t generate data resilience problems.

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 is fully deduplicated on the persistent data pool, 1,000 virtual desktops look like a single image from a storage capacity perspective.

The downside of HCI architecture is that it protects desktops by saving copies of the VDI data across servers, which creates east-west networking traffic. Data is persistently stored across multiple servers. For large deployments with high-networking traffic across servers, networks may need to be updated with a spine-and-leaf architecture.

Multi-Dimensional Growth (Performance vs. Capacity)

VDI workloads are heavy in IOPs, so they're usually delivered by HCI vendors using locally-attached flash. However, to scale the number of virtual desktops, users have to add servers to the cluster, and with new servers, they have to add extra storage capacity. HCI commonly specifies hardware vendors, models, and configs – usually a combination of flash and HDDs. 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 it's still overkill in most scenarios.

Unlike HCI, DVX enables capacity and performance to grow in different dimensions. If performance is needed, the IT team can add a new Host with a couple of flash devices; or, if capacity is required, they can add another Data Node – up to 10 data nodes and up to 1.7 petabytes of usable capacity.

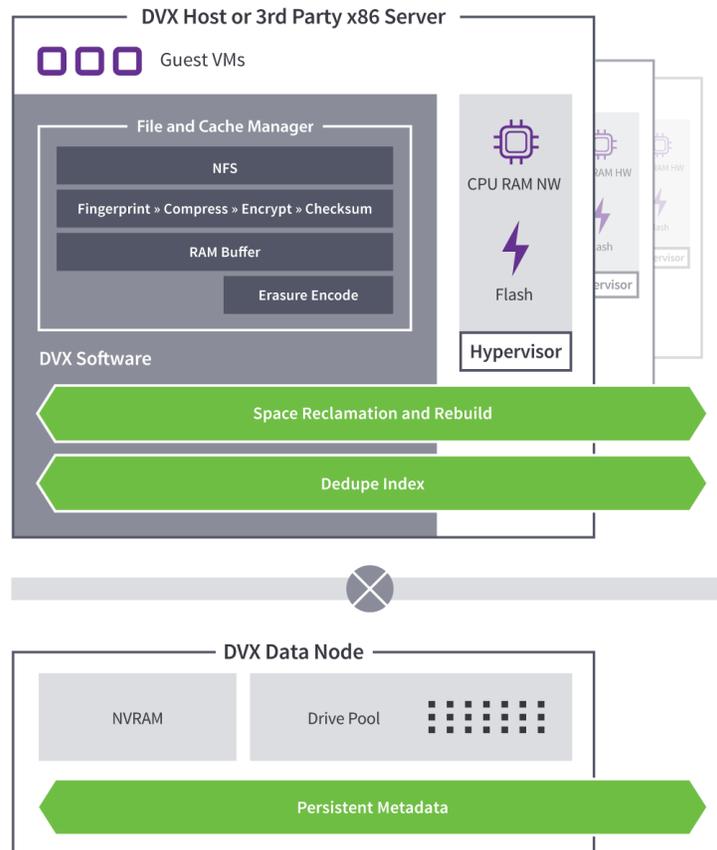


Figure 1 – High Level Logical DVX Architecture

Non-Persistent, Floating, and Instant Clones

When it comes to Non-Persistent, Floating, and Instant Clones, it doesn't make sense to run them on servers with persistent storage and replication factors as well as RAID overhead.

DVX stores temporary data on Hosts without the overhead of RAID or mirroring. Only the virtual desktop data that's 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 might imagine, the data commonality is exceptionally high across 100s or 1000s of virtual desktops. This method and feature also significantly reduce the amount of data that's sent over the network.

Persistent Desktops

Many organizations still like to have some of their virtual desktops be persistent across users and sessions. To be cost-effective, HCI vendors recommend that clusters are configured with two-way mirroring instead of three-way mirroring. No serious enterprise production deployment should use data protection techniques similar to RAID 5 anymore.

DVX always protects virtual desktops with Erasure Coding (distributed three-way mirroring with N+2 parity stripes), keeping a backup (or copy) of all deduplicated 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's 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 16-20 hosts as part of a single-cluster deployment. The result 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.

DVX has been validated by IOmark with 128 Hosts and 10 Data Nodes, providing up to 18M IOPS, 8 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 DVX supports multiple VMware vSphere clusters as part of the same Datrium domain, presenting a single namespace across VMware clusters.

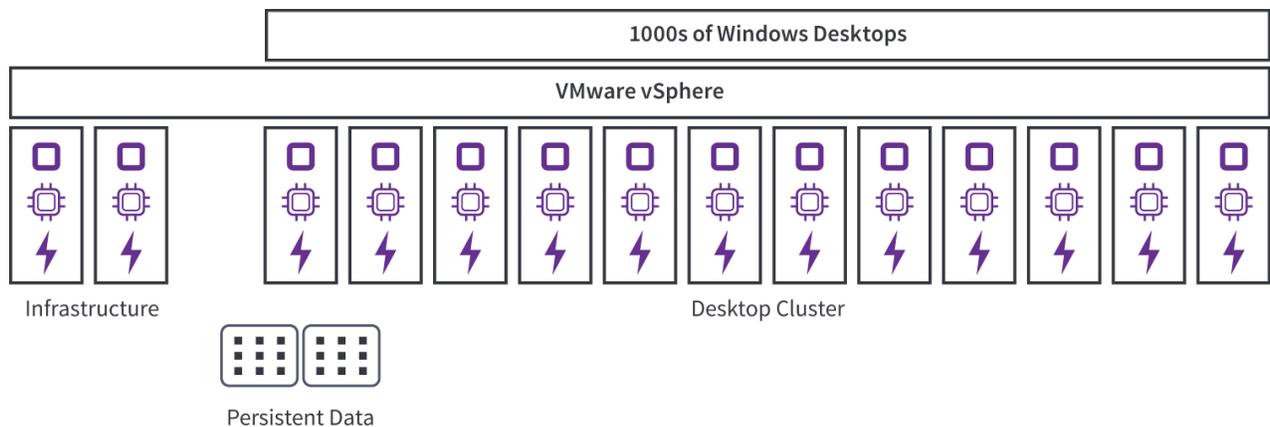


Figure 2 – VDI Scale-Out Architecture – 1000s of User Pods Example

Data Mobility and Protection

VDI environments typically span multiple sites to achieve a better end-user experience by placing the virtual desktops closer to the end users, which reduces 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 practice ensures that end users can log in to any site and have a common experience. VDI Administrators need to move Golden Images quickly and easily between multiple sites along with the Golden Image Snapshots that are used to update and create new Desktop Pools.

Using Automatrix built-in Elastic Replication with Universal Deduplication, a VDI Administrator can replicate any VM or file stored on a DVX to another DVX within the VDI environment. Here are some examples of how 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 Master Images, AppStacks are often shared across VDI environments. Using Elastic Replication, VDI Administrators can replicate their AppStacks between all sites within their VDI environment. It sounds like a straightforward process, but it's actually very difficult in an HCI environment because traditional replication engines can't handle standalone VMDK files, commonly used by VMware App Volumes.

Writable Volume Replication

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

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 use Windows File Servers and App Writable Volumes to store User Data and Profiles. Using Automatrix native Snapshots and Elastic Replication, VDI Administrators can offer end users a Recovery Point Objective (RPO) as low as 5 minutes for their Data and Profiles.

Immutable Snapshots for Ransomware Protection

DVX mitigates the risk of ransomware attacks. Teams can easily restart instantly from recent immutable snapshots or backups that are months or years old. With converged backup and DR, administrators have millions of point-in-time consistent recovery points to choose from, so they can quickly restore the entire data center. Access to deep backups is critical because ransomware attacks may only be apparent months after the initial event.

Datrium DRaaS (DR-as-a-Service) for VDI

Datrium DRaaS with VMware Cloud on AWS is a comprehensive cloud-based backup and disaster recovery service for the protection of VMware workloads on premises and in the cloud that's built on top of the Automatrix platform. It leverages the execution and operational efficiencies of a single integrated data stack to automate and orchestrate all aspects of DR.

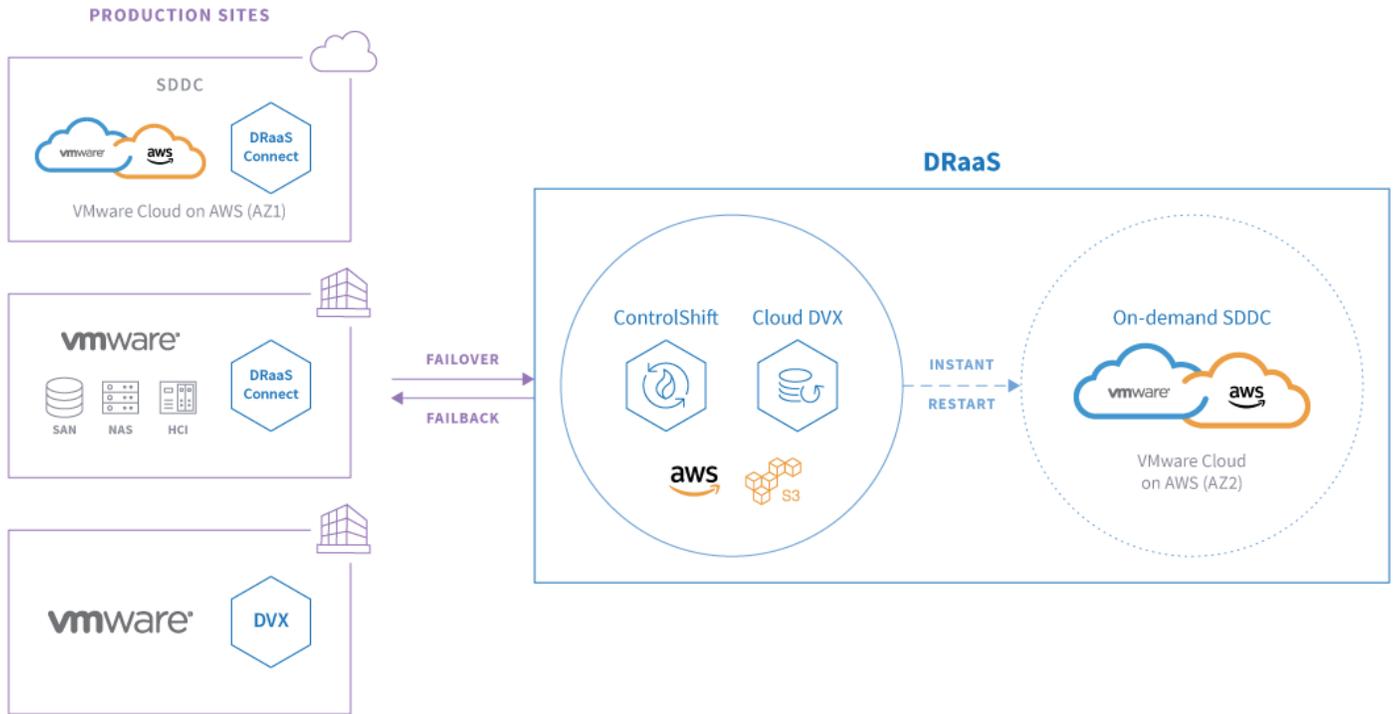


Figure 3 – On-Demand DR with VMware Cloud on AWS

DRaaS delivers a single-stack backup and disaster recovery service with instant RTO for the enterprise, without contract management overhead. The solution offers a single provider, a single bill, and enterprises can use VMware Cloud on AWS SDDC for automated and user-defined DR plans that have failover and failback from the public cloud.

DRaaS leverages AWS S3 for a cost-effective backup, while the integrated data and orchestration stack enables continuous compliance checks of the entire environment, which dramatically reduces errors when a disaster occurs.

With DRaaS, you get a complete solution that delivers comprehensive support, simplified purchasing, and billing, which eliminates the cost and friction caused by multiple point solutions. You get everything you need to protect all of your VMware workloads in one solution for failproof, on-demand DR to the public cloud from on premises or another availability zone.

VDI Administrators can execute on-demand failover of VMware Horizon servers and desktops to VMware Cloud on AWS using ControlShift DR plans. DR sites in VMware Cloud on AWS are deployed in advance or on demand for testing or an actual failover in a disaster. IT teams can choose from a broad range of DR sites around the world and only pay for their disaster recovery site when they need it.

Administrators can efficiently fail back their VDI infrastructure servers and desktops with minimal AWS egress charges by using DRaaS, which only transfers changed and globally deduplicated data.

ROI Advantage

Automatrix offers IT organizations the opportunity to drive revenues 5x faster, reduce time spent managing infrastructure by as much as 95%, and reduce infrastructure costs by up to 75%. To achieve these benefits, Datrium has evolved the server-powered, 1-tier model of HCI to deliver scalable data consolidation, including flexible, low-latency performance, resilience for mission-critical mixed workloads, mixed server environments, and converged backup across on-prem environments and the cloud.

Conclusion

Most VDI deployments are difficult because of the complexity that comes with brittle, expensive array-based infrastructure. Traditional HCI has failed to deliver an answer for massive consolidation, low latency workloads, and built-in backup in on-prem and cloud deployments. Datrium Automatrix provides the ultimate flexibility and performance for virtual desktops. It handles the most demanding applications as well as boot and login storms. It scales from a few hundred desktops to thousands, all while maintaining compelling economics with a high return on investment.