IDC PERSPECTIVE

Buyer Case Study: Neovera Finds a New Truth with the Move to Open Convergence Infrastructure

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EXECUTIVE SNAPSHOT

FIGURE 1

Executive Snapshot: Open Convergence Move Delivers for Neovera

Keeping up with high business growth was stretching Neovera, a trusted provider of cyber security services and enterprise cloud solutions, to the limits with its legacy storage infrastructure. A move to "open convergence" infrastructure from Datrium, based around newer software-defined storage design precepts, allowed Neovera to get ahead of their customer requirements and position the company strategically for future growth.

Key Takeaways

- In high-growth environments demanding increasing IT agility, monolithic legacy storage platforms can have high baseline costs for performance management, capacity expansion, and ongoing administration.
- More modernized, "open convergence" infrastructure can meet the performance, scalability, and availability requirements for many mission-critical workloads with easier management, improved agility, and significantly lower capital and operational expenditures.
- Many CIOs that manage large, high-growth cloud infrastructures have a preference for deploying disaggregated storage infrastructure due to its more flexible expansion options.

Recommended Actions

- Consider newer, more software-defined storage infrastructure for workloads of all types, including mission critical, when legacy storage infrastructure comes up for technology refresh.
- Understand how much improved IT agility can impact the customer experience you generate for your customers.
- For workloads with any degree of performance sensitivity, make sure that flash is part of your new storage infrastructure.

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SITUATION OVERVIEW

Neovera is a trusted provider of cybersecurity services and enterprise cloud solutions. Serving customers across the financial services, global media, healthcare, education, retail, technology, and nonprofit sectors, Neovera provides operationally proven expertise to prevent security breaches and data loss as well as secure enterprise cloud solutions. Based in North America, Neovera operates multiple tier 4 datacenters, which today host a variety of critical workloads, including trade accounting, settlement, and other high-end transaction platforms for its financial customers as well as collaboration (email) and other enterprise applications for order and inventory management, enterprise resource planning, and customer relationship management, for its cross-industry customer base. Founded in 2001, Neovera's business is growing rapidly and it plans to expand into international operations in the near future.

With its high growth, Neovera has had to constantly expand its IT infrastructure to support both customer-facing and internal operations. Due to the high requirement for resiliency and availability, most of Neovera's existing IT infrastructure had been built around high-end monolithic storage platforms that delivered "five-nines plus" availability. Most of the individual storage platforms in its infrastructure were hybrid flash arrays (HFAs). As Neovera's capacity under management increased, storage management was becoming increasingly difficult and responding rapidly to customer requests to provision new resources was becoming tougher. Storage capacity expansion was also becoming more of an issue, and the monolithic design of Neovera's existing storage infrastructure was limiting its flexibility in this area. Its legacy infrastructure was generally meeting storage performance requirements, although there was some time spent each week doing manual tuning and workload rebalancing.

Most of Neovera's enterprise infrastructure is virtual, based around VMware. There were still a few workloads running on physical servers because those workloads specifically required them. Neovera was a bit cautious about whether or not it could run those workloads that required the highest performance levels on virtual machines (VMs), but due to the flexibility and ease of management of virtual environments, it wanted to run as many workloads as it could on VMware ESXi.

Scott Weinberg, the CEO of Neovera, was still happy with his existing storage infrastructure and vendor, but he was aware that newer designs, built more around software-defined storage concepts and commodity hardware, promised to provide very similar performance and resiliency while offering significantly easier storage management and lower overall cost. Many software-defined storage products implemented a design precept that IDC calls "autonomous storage management," which hides much of the complexity of traditional LUN-based storage administration and makes routine operations like provisioning much faster, easier, and more intuitive. Over the past five years, IDC has noted that storage management tasks are increasingly migrating away from dedicated storage administration teams and more toward IT generalists, a development which not only lowers administrative costs but also improves responsiveness. Software-defined storage has been a strong enabler of this trend. Neovera began to look into alternative storage architectures that it could add to its existing IT infrastructure to better meet these requirements.

Challenges and Solution

Before starting off on a search for new storage infrastructure options, Neovera assembled a set of purchase criteria. Any new system it brought in would have to deliver at least the same level of performance — from a latency, throughput, and bandwidth perspective — as its existing legacy storage

infrastructure while being significantly easier to manage and expand. The system would also have to exhibit a significantly lower cost structure from both a capital and operational expense point of view, yet be capable of surpassing a "four-nines" availability requirement. Finally, it wanted to stay with a disaggregated storage infrastructure architecture to provide the flexibility to configure compute and storage resources independently to best meet its needs and to make more efficient use of shared resources.

Neovera looked at several architectures. Although hyperconverged infrastructure (HCI) did not meet its need for disaggregated storage, the burgeoning popularity of such systems warranted a look. Weinberg did determine that, in addition to lacking the flexibility to configure compute and storage resources independently, hyperconverged platforms on the market also did not meet Neovera's requirements for storage capacity expansion. Neovera also looked at all-flash arrays (AFAs). While these systems could easily meet Neovera's performance requirements, the cost savings over its legacy infrastructure was less than what it was hoping for. Weinberg did feel, however, after noting flash's ability to handle storage spikes while continuing to deliver predictably low latencies, that flash would likely be a part of the ultimate solution Neovera chose.

Datrium offers a unique architecture, referred to by the vendor as "open convergence," that promised to meet a number of Weinberg's purchase criteria requirements. The "open converged" storage platform is distinctly different from other types of converged infrastructure — it offers the simple scale-out growth benefits of the hyperconverged model, the resiliency and flash performance benefits of the disaggregated model, and the autonomous storage management and cost benefits of the newer software-defined storage model. The Datrium DVX, the vendor's enterprise storage solution, is a consolidation platform for both primary and secondary storage. Customers can buy a preconfigured, rack-scale system that includes both compute and storage from Datrium, or they can buy through a more software-defined option that provides the physical storage capacity (the disk shelves and controllers) but lets them deploy with the server hardware of their choice.

For Neovera, Datrium's more software-defined approach gave it complete freedom in choosing its compute infrastructure, as long as the servers were based on commodity x86 hardware. Datrium's design, however, provided a host-based caching layer for performance, while all the data protection was centered around a shared secondary storage pool. Flash could be used for the caching layer in the form of off-the-shelf solid state disks (SSDs) configured into the hosts, giving Neovera the ability to leverage flash for performance reasons. Datrium's caching algorithms promised a very high cache hit rate, in part because the entire flash capacity on the hosts could be used for data, which was protected by backing storage in a centralized pool (instead of redundant data in the hosts).

Datrium was also built around an enterprise-class virtualization and storage design, leveraging hardware redundancy and highly resilient data protection, such as erasure coding and remote replication, to support transparent recovery from device failures, nondisruptive hardware upgrades, fast and easy replacement of failed components, and online software upgrades. Enterprise-class data services included erasure coding (instead of RAID) options, compression, deduplication, thin provisioning, space efficient, read/write capable snapshots, encryption, and replication. Capacity expansion was simple — additional storage capacity could be added to the central pool and then easily made available for use with any and/or all of the attached servers. Also, finally, the Datrium software had been designed using many of the design concepts of software-defined storage, providing autonomous storage management features that promised to simplify management significantly. Another feature of software-defined storage design is that significant new features, such as snapshots,

replication, and encryption, can be nondisruptively added to systems already in place without requiring any new hardware.

Based on a thorough review of the features, Neovera brought Datrium in under a "try and buy" program that gave Weinberg the option to return the system if it did not prove out in production use. Weinberg's team initially tried out both customer-facing and internal workloads on the system and were impressed with the performance it delivered at a price point significantly below all the other options it looked at. The system was configured with a flash caching layer in the hosts, connected over 10GbE links, and used 7,200rpm hard disk drives (HDDs) as the centralized backing storage. Early tests indicated close to a 100% cache hit ratio, a strong testament to the accuracy of Datrium's prefetching and other caching algorithms, which easily delivered sub-millisecond latencies for both reads and writes. All writes from the host hit NVRAM in the backing storage are mirrored to NVRAM in another backing store controller, and then acknowledged. The read cache is not protected by redundant storage in the host — rather, it relies on the backing storage to recover in the event of any read cache component failures, freeing up the entire read cache capacity for unique data to help maximize cache hit ratios.

Weinberg's team also looked at common management operations such as storage provisioning, software upgrades, and replacing failed components. Datrium uses a VM-aware storage management paradigm that allows all provisioning, monitoring, and data service operations to be performed at the VM (and hence the application) level, making storage management much more intuitive for nonstorage administrators. Software upgrades can be applied nondisruptively without impacting any application services, and all DVX hardware on a per node basis is redundant, dual ported (where applicable), and hot swappable (controllers, disks, power supplies, and fans). The system appeared easily capable of exceeding "five nines availability."

Results

Neovera initially placed what it considered to be nonmission critical workloads on the first DVX during the trial period. Right up front it experienced two SSD failures on different hosts, but there was no application services impact and no data loss. The problem was quickly isolated to an SSD firmware issue, which was rapidly addressed by Datrium and its SSD supplier. After that one failure, there have been no failures, and this occurrence gave Weinberg's team the opportunity to experience the high quality of Datrium's support. Since the initial installation, Neovera has installed several software upgrades and added additional storage capacity — all without any downtime. Storage provisioning times have dropped from several days to easily less than a day, making them much more responsive to the demands of their customers, whether those are external (cloud customers) or internal (their own employees).

Outside of the lower cost, the biggest operational difference Neovera noted is the improvement in administrative productivity due to Datrium's ease of use. With its legacy storage infrastructure, Neovera generally needed highly skilled and experienced storage administrators to get involved in almost every storage operation, but with Datrium's ease of use, workflow wizards, and other autonomous storage management features, Weinberg is very comfortable with his Windows and Linux engineers handling storage provisioning and many other issues. This allows Neovera to respond faster while freeing up expensive storage engineers for other tasks. Because of the systems' stellar ability to handle I/O bursts, it is now basically spending no time on performance tuning. Datrium's VM-level management makes it easy to apply data services operations at the application level, and these same

engineers are now taking snapshots for data protection purposes on their own, a change which has improved their recovery point objectives (RPOs).

The Datrium DVX includes compression and deduplication, and Neovera is using it across all of its workloads. Neovera noted that, with its initial system, it was getting slightly better than 2.5:1 data reduction, but as it expanded capacity, it noticed the effective data reduction ratio (which does not include space savings because of its space-efficient snapshot implementation) inching up closer to 3:1. Achieving these ratios further lowers its effective dollar-per-gigabyte cost, which was already well below what Neovera was paying for its legacy storage infrastructure. "I'm paying less than a third of what I was before on a dollar-per-gigabyte basis, and I'm getting better, more consistent performance," noted Weinberg. He is also planning to start using encryption, a recently introduced feature from Datrium that will allow Neovera to easily encrypt at the application level, making this yet another storage management task that is easily performed by IT generalists (rather than dedicated storage administrators).

After seeing how the initial Datrium DVX solution performed, Neovera quickly bought three others. All told they have 150TB of storage on Datrium, which represents almost 10% of their total storage capacity under management. Within its headquarters campus, located in Ashburn, Virginia, Neovera is replicating between DVXs for disaster recovery purposes. It is currently working to bring additional datacenter capacity online in Chicago, and once that is operational, it will be replicating to a DVX array there as well (from Ashburn). Over time, Neovera expects to move more and more of its storage for both customer-facing and internal workloads over to Datrium, giving it the opportunity to redeploy some of the older storage for secondary uses such as development and test. Datrium expects that it will have some legacy infrastructure around through at least one more depreciation cycle (which for Neovera is four years).

The move to Datrium has provided other benefits to Neovera as well. With the performance the DVX systems are providing, Weinberg has more flexibility to host some of its most demanding workloads, like data warehousing, on VMs. "Most people think you can't put a data warehouse on a VM, but with Datrium's performance density features, we can throw multiterabyte data warehouse systems on the DVX and get better performance than if we ran it on a physical server," explained Weinberg. "And the host-based flash caching layer delivers stellar performance – the DVX performed more than four times faster on reads and two and a half to three times faster on writes than the fastest AFAs we looked at." Storage provisioning happens eight times faster than before, and its ability to spin up new VMs when requested within hours means Neovera's clients are up and running sooner and Neovera's time to revenue is faster. The higher storage density of the DVX solution is also making an impact – the 150TB of Datrium capacity takes up less than a third of the rack space for the same capacity with its legacy infrastructure and uses less power and cooling. Datrium's always-on compression and deduplication for both solid state and spinning disk media are a strong contributor to this and deliver its space savings while still allowing the system to deliver storage latencies lower than AFAs.

IDC'S POINT OF VIEW

While proven legacy storage infrastructure platforms deliver high reliability, availability, and management flexibility, newer architectures that are much easier to manage and scale can reliably service many workloads for significantly less cost. Many of these newer designs are also much more agile, improving IT responsiveness by an order of magnitude when it comes to common operations like storage provisioning and spinning up new VMs. The industry in general is moving in the direction of

more software-defined storage architectures rather than hardware-defined storage architectures, and this is enabling IT generalists rather than dedicated storage administrators to reliably manage most storage operations, lowering costs while increasing responsiveness, improving productivity, and expanding span of control.

CIOs across industries will need to transform their IT infrastructures to keep up with the increasing pace of business and to maintain competitive differentiation. Neovera's purchase criteria — easy scalability, high performance, autonomous storage management capabilities that enable IT generalists to handle most storage management tasks, and lower costs — are broadly applicable across most industries. As monolithic legacy storage infrastructure comes up for technology refresh, IDC expects enterprise storage spend to continue to move away from older, more hardware-defined platforms to the flexibly agile, lower-cost, more software-defined platforms that better meet these requirements.

By moving to Datrium's "open convergence" storage platform, Neovera is enjoying these benefits, allowing its business to keep up with and respond faster to customer needs. In the process, it is in fact delivering better, more consistent performance with a more commodity hardware-based infrastructure that costs less, is easier to manage, and can be scaled nondisruptively. With its increased infrastructure density, reduced energy consumption, lower administrative costs, and easier expandability, Neovera's move to Datrium positions it well for its planned future expansions.

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Related Research

- *Spending on IT Infrastructure Supporting Public Cloud Services Will Be Fastest Growing Among IT Deployment Segments in 2017, According to IDC* (IDC #prUS42831117, July 2017)
- *Worldwide and U.S. Enterprise Storage Systems Forecast, 2017-2021* (IDC #US42502017, May 2017)
- *Market Analysis Perspective: Worldwide Storage Systems, 2016 — Growing Demand for Software-Defined, Flash-Accelerated Persistence* (IDC #US40357815, September 2016)

Synopsis

This IDC Perspective provides a buyer case study for Neovera, a trusted provider of cybersecurity services and enterprise cloud solutions, that focuses on its evolution to a more modernized storage infrastructure based around enterprise arrays from Datrium. It looks at the business and technical issues that drove its decision to update its legacy storage, identifies the purchase criteria that it used to make the decision, and reviews its experiences after Neovera moved to Datrium's "open convergence" architecture systems.

"Service providers need agile storage infrastructure that leverages flash to meet the demanding requirements of today's customers," said Eric Burgener, research director for Storage. "Datrium's unique 'open convergence' architecture offers a compelling blend of easy scalability and high performance with the cost benefits of the software-defined storage model in a disaggregated storage solution."

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