

## **THE MODERN DATA-CENTER: WHY NUTANIX CUSTOMERS ARE REPLACING THEIR NETAPP STORAGE**

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Several Nutanix customers shared with Taneja Group why they switched from traditional NetApp storage to the hyperconverged Nutanix platform. Each customer talked about the value of hyperconvergence versus a traditional server/networking/storage stack, and the specific benefits of Nutanix in mission-critical production environments.

Hyperconverged systems are a popular alternative to traditional computing architectures that are built with separate compute, storage, and networking components. Nutanix turns this complex environment into an efficient, software-based infrastructure where hypervisor, compute, storage, networking, and data services run on scalable nodes that seamlessly scale across massive virtual environments.

The customers we spoke with came from very different industries, but all of them faced major technology refreshes for legacy servers and NetApp storage. Each decided that hyperconvergence was the right answer, and each chose the Nutanix hyperconvergence platform for its major benefits including scalability, simplicity, value, performance, and support. The single key achievement running through all these benefits is “Ease of Everything”: ease of scaling, ease of management, ease of realizing value, ease of performance, and ease of upgrades and support. Nutanix simply works across small clusters and large, single and multiple data-centers, specialist or generalist IT, and different hypervisors.

The data-center is not static. Huge data growth and increasing complexity are motivating IT directors from every industry to invest in scalable hyperconvergence. Given Nutanix benefits across the board, these directors can confidently adopt Nutanix to transform their data-centers, just as these NetApp customers did.

### ***Nutanix Customers’ favorite Benefits***

We interviewed four Nutanix customers who replaced data-center complexity with Nutanix simplified web-scale architecture. Instead of managing separate servers and NetApp storage, they integrated compute and storage resources for extreme scalability, management simplicity, reliability, and non-disruptive upgrades in virtualized environments. They listed their favorite benefits:

- **Innovation.** Replacing legacy 3-tier architecture and simplifying management are critical steps to modernizing data-centers. Nutanix’ innovative technology enables web-scale architecture and centralized global management.
- **Scalability.** Extreme scalability of servers, memory and storage enables data-center directors to non-disruptively grow the Nutanix environment. Nutanix enables customers to buy only as

much equipment as they need for current projects. As they launch new projects, they can easily scale equipment without increasing management complexity or incurring downtime.

- **Ease of Use.** These customers traded NetApp storage complexity and management tasks for Nutanix simplified management console. They were able to reassign storage specialists to other IT functions, which saved large amounts of money on data-center infrastructure. Even generalist IT can easily manage Nutanix comprehensive computing environment including servers, storage, and sites. Each customer also contrasted Nutanix' 1-click, non-disruptive upgrade to the time-consuming NetApp upgrade process.
- **TCO Value.** Customers realized dramatic savings both on purchase and ongoing costs. Nutanix hyperconvergence platform was a major savings over purchasing separate servers and traditional storage. The savings multiplied on operational costs – for example, maintenance and support costs are a fraction of NetApp's. Management simplicity also lowers costs by reducing the need for specialized server and storage admins.
- **Performance.** Flash-based Nutanix multiplied performance gains over legacy NetApp storage at all customer sites. One customer reported that performance had improved by 45%.
- **Reliability.** Each customer is running critical workloads on the platform, and built-in replication and erasure coding work to protect applications and data. Synchronous replication in particular protects mission-critical VMs in fully mirrored configurations. Nutanix also comes with analysis tools to easily troubleshoot issues in the virtual environment.
- **Support.** Each customer reported that they rarely needed to contact Nutanix support, but when they did they received a fast and expert response. In addition, Nutanix offers proactive help to support customers and optimize systems.

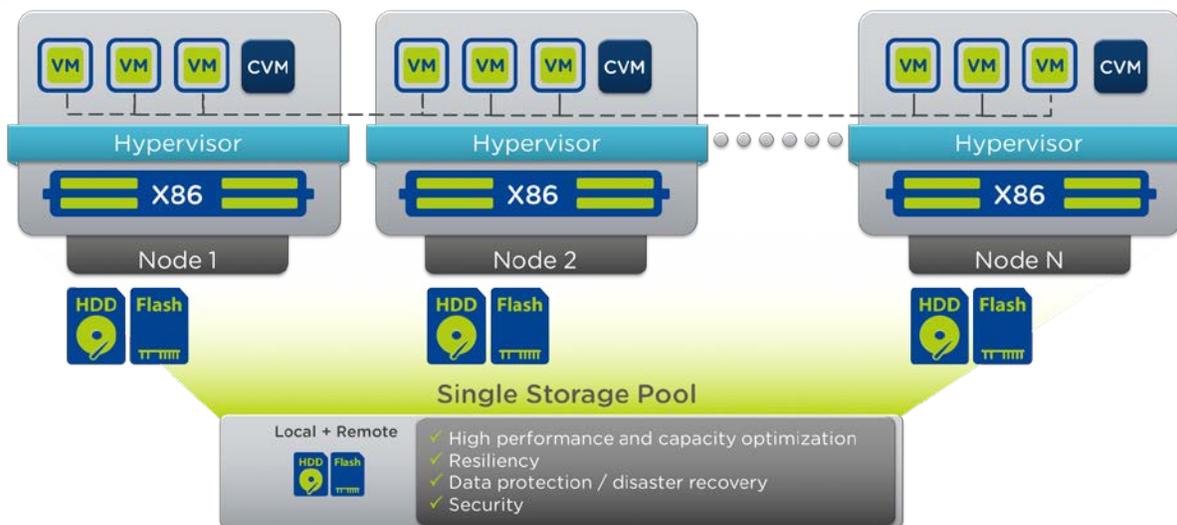
### Summary of Customers moving from NetApp to Nutanix

Customer Name	Adam Savage	IT Architect	IT Director	Infrastructure Director
Company Name	UNIVERSITY OF WATERLOO	CHEMICAL COMPANY	GLOBAL LAW FIRM	INTERNATIONAL LAW FIRM
Industry	Education	Chemical and Mining	Legal	Legal
Primary Work Load	<b>IaaS &amp; VDI</b> (Digitizing Projects, Web Services, ARES)	<b>IaaS &amp; VDI</b> (SAP, Dev/QA, BizTalk, Microsoft)	<b>IaaS &amp; VDI</b> (SharePoint, Document Management, MS Office, File Services, MS SQL, Test/Dev)	<b>IaaS &amp; VDI</b> (SQL, File Services, Legal applications)
#1 Reason	<b>Scalability</b>	<b>Ease of Use</b>	<b>Performance</b>	<b>Performance</b>
#2 Reason	<b>Performance</b>	<b>Performance</b>	<b>Ease of Use</b>	<b>Ease of Use</b>
#3 Reason	<b>Ease of Use</b>	<b>Innovation</b>	<b>Support</b>	<b>Support</b>

## HOW NUTANIX PROVIDES CUSTOMER BENEFITS

Nutanix enterprise cloud platform is web-scale HCI system. This modern scale-out HCI system combines a flash-first software-defined storage architecture with VM-centric ease-of-use that far exceeds any traditional shared storage or three-tier approach on the market today. Nutanix is considered the leader in this product category and is now demonstrating that many of their customers, including those in this report, rely on their products to meet all their data-center compute and storage requirements. In this section we analyze the Nutanix architecture and explain why it met these customers' expectations. The overall Nutanix web-scale architecture is shown in Figure 1.

Figure 1: Nutanix Architecture



The Nutanix platform is a scale-out cluster of high-performance nodes, or servers, each running a standard hypervisor and containing processors, memory and local storage (consisting of flexible combinations of SSD Flash and high capacity SATA disk drives). Each node runs virtual machines like a standard virtual machine host. Local storage from all nodes is virtualized into a unified pool by the Acropolis Distributed Storage Fabric (ADSF). Virtual machines running on the cluster read and write data to ADSF as if they were connected to traditional shared storage.

The Nutanix modular scale-out approach enables customers to select any initial deployment size and grow in granular data and compute increments. This removes the large up-front infrastructure purchase, ensuring a faster time-to-value for the implementation.

### **Performance Optimization for all Applications**

The customers interviewed had a variety of applications which included VDI deployments to their enterprise ERP and CRM applications. These applications have demanding SLA requirements which require that storage subsystems have tunable and consistent performance behavior. Nutanix ADSF is a modern flash-first architecture with an intelligent data tiering process that automatically handles data placement based on access patterns and policies (such as pinning to flash).

The following are key data service capabilities that can be configured at the VM level enabling Nutanix platform to operate efficiently in multi-tenant tier-1 application environments.

- **VM Flash Mode:** For the most demanding applications there is an option to pin the entire virtual disk to SSD. Additionally, all-flash nodes allow for applications to achieve predictably low latencies across the entire cluster.
- **Flexible Capacity Optimization:** Initial writes to ADSF are replicated for redundancy at high performance levels producing a very consistent latency regardless of the optional optimization techniques that might be applied. Nutanix supports deduplication, compression, and erasure coding as key technologies for data optimization.
- **Block or File access:** Some tier-1 applications are better suited for block access. Volume Groups can be created and exported to the Guest VMs through ADSF using iSCSI, eliminating the need for a separate storage system. The latest generation of software also provides native file serving capability through Acropolis File Services.

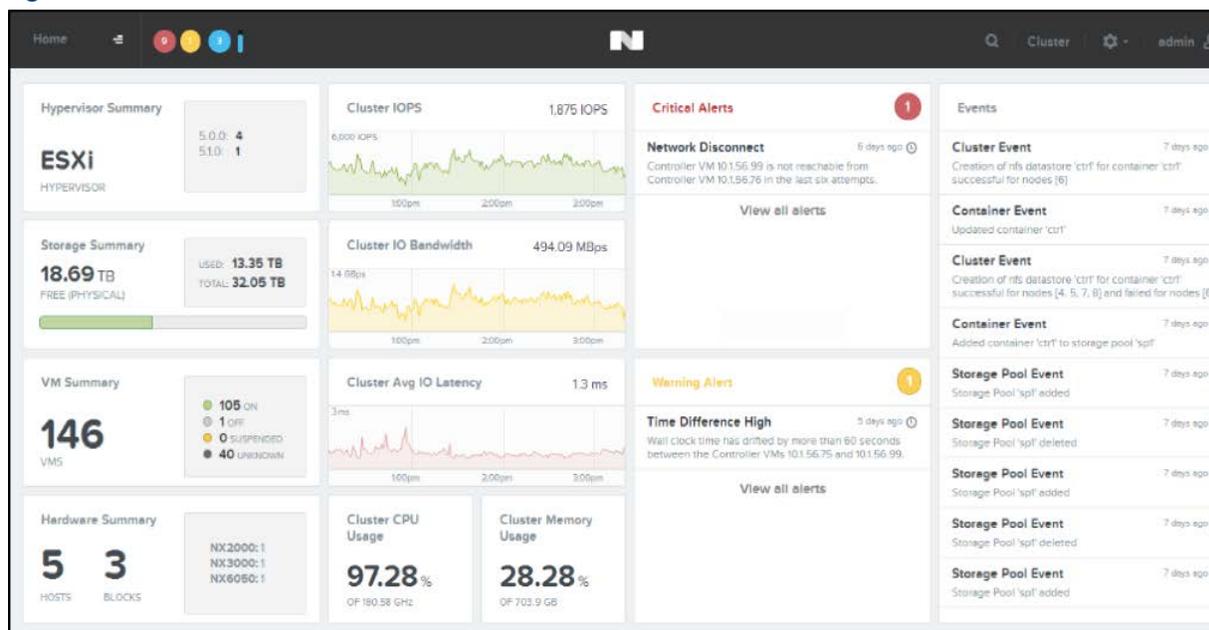
### Flexible Modular Scalability

Modular scale-out enables customers to select an initial deployment size and grow in more granular data and compute increments. However, to tune the cluster for specific workloads it is important to have options to scale compute resources at a different rate than storage resources or vice-versa. The Nutanix platform is extremely flexible and the streamlined configure-to-order (CTO) process enables the build out of a wide variety of CPU, memory and storage options. All node types are supported within a cluster and Nutanix appropriately uses each for a given workload.

### Simple Infrastructure Management

Nutanix Prism, the overarching infrastructure management platform, provides simple control of the complex VM infrastructure. Managing VMs through Prism makes control independent of hypervisor choice. Prism is also a unique in that it provides end-to-end lifecycle management for both hardware nodes and infrastructure software components, including the chosen hypervisor. Prism has 1-click simplicity for the most important system administrative tasks: rolling upgrades, operation insights and troubleshooting. Figure 2 illustrates the intuitive dashboard approach for Nutanix Prism which is independent of hypervisor environment.

Figure 2: Nutanix Prism Dashboard



## Reliability and Data Protection

At the heart of business continuity with Nutanix is an extremely reliable always-on infrastructure. Using the same clustering technology as web-scale architectures means that nodes can fail and the infrastructure continues running. Unlike dual node active-active architectures that can greatly diminish in performance when a controller fails, Nutanix performance drops very little if a node fails and will become imperceptible as the cluster grows. Nutanix can be configured to achieve two-node failure resiliency and erasure coding ensures that the storage efficiency remains high. Site-level business continuity is maintained through synchronous and asynchronous replication depending on the RPO and RTO that the enterprise application environments require.

## CUSTOMERS VALIDATE NUTANIX WEB-SCALE PLATFORM

We learned why Nutanix customers made the switch from traditional servers and NetApp storage to Nutanix hyperconverged architecture.

Benefit	Nutanix Approach	Customer Quote
<b>Scalability</b>	Modular scale-out enables customers to select any initial deployment size and grow in granular data and compute increments.	<i>"With NetApp we had performance problems every day. With Nutanix, we noticed a huge improvement right from day one. Performance is like night and day." (Infrastructure Director, international law firm)</i>
<b>Ease of Use</b>	Nutanix Prism management platform drives simplicity by rendering the VM infrastructure nearly transparent.	<i>"It's so easy that there is no problem with the hand off. Just one person brings it up and manages it. It's extremely simple to use." (IT Director, global law firm)</i>
<b>TCO Value</b>	Nutanix combines a right-sized infrastructure, ease of use, and low operational costs to produce one of the industry's lowest TCOs.	<i>"In a 3-tier architecture, we would have had to buy infrastructure for both phases up front. That would be a major upfront expense and would take some guesswork for the second phase. With Nutanix, we could buy the infrastructure for the first phase now, and simply add onto it when we were ready for the second phase." (Adam Savage, University of Waterloo)</i>
<b>Performance</b>	Nutanix flash-based ADSF intelligently tiers data, automatically placing data based on access patterns and policies.	<i>"Performance was the most important to us. Moving to Nutanix, we're seeing far, far better IOPs performance than we did on NetApp. My internal customers have seen an immediate difference in performance." (IT Director, global law firm)</i>

<b>Support</b>	Nutanix support offers rapid response and a single contact for each customer. The company maintains a Net Promoter score of greater than 80.	<i>"We had a problem with VMware. We called them but they told us this was not a VMware problem and distanced themselves. We called Nutanix, who dug in until they found the issue in Cisco firmware. It took the Nutanix guys to find the problem." (Enterprise Architect, Chemical Company)</i>
<b>Reliability</b>	An extremely reliable, always-on infrastructure is the heart of the Nutanix platform. Web-scale clustering technology ensures that even if complete nodes fail, Nutanix keeps on running.	<i>"We had a lot of NetApp storage. Our storage engineers managed what they could and we partially outsourced management and maintenance. With Nutanix, we phased out storage engineers to other projects and canceled our outside contracts." (Data-center Architect, Chemical Company)</i>
<b>Non-disruptive upgrades</b>	Customers can easily add new nodes to a cluster, and can non-disruptively upgrade the software with a 1-click rolling upgrade.	<i>"We use the 1-click upgrade feature on live production data. The upgrade process is surprisingly fantastic." (IT Director, Global Law Firm)</i>

## MAKING THE SWITCH: NUTANIX CUSTOMERS SPEAK OUT

### *Global Law Firm*

This law firm is one of the largest in the world with over a thousand attorneys located in Europe, the U.S. and Asia. The IT Director works with his counterparts to oversee two data-centers in the U.S. and Europe.

#### PRIMARY DRIVERS TO CHANGE

- **Poor performance.** A dedicated NetApp cluster ran VDI but performance was sub-standard. The team treated the technology refresh as an opportunity to capitalize their infrastructure and improve performance throughout the stack.
- **Complexity.** The traditional legacy environment had a large hardware footprint and was complex to manage. Along with slow performance, these factors drove a move to hyperconvergence.

#### NUTANIX ENVIRONMENT

The initial Nutanix deployment was a 3-block cluster serving VDI. Today the data-center hosts 300 desktops and a dozen terminal servers. The successful VDI project launched the U.S. data-center's migration from NetApp to Nutanix. This year, the European data-center will also upgrade to Nutanix and the data-centers will mirror to each other.

Today the U.S. data-center is 95% virtualized with about 450 VMs. Virtualized workloads include 24x7 mission-critical applications like SharePoint, document management, back office systems, file services, and MS SQL. These workloads plus test/dev operations run from a single cluster with an effective useable capacity of about 60TB. Utilization is roughly 50% on CPU and about 70% capacity on storage.

### TOP ADVANTAGES

- **Performance.** Although the NetApp was a hybrid flash system, Nutanix flash is located on the same chassis and backplane, making performance much faster. The Director commented, “Performance was the most important to us. Moving to Nutanix, we’re seeing far, far better IOPs performance than we did on NetApp. My internal customers have seen an immediate difference in performance.”
- **Management simplicity.** The team has a single part-time Nutanix administrator who passes off daily operations to the operations team. “It’s so easy that there is no problem with the hand off. Just one person brings it up and manages it. It’s extremely simple to use.” The team also appreciates power savings and a 10:1 reduction in rack space.
- **Support.** Upgrade and support have been uniformly excellent. Support is responsive and engineers accelerate any expedited issues. The law firm’s team also used the 1-click upgrade feature live on production data. The Director reported the upgrade process was “surprisingly fantastic.”

### WRAP-UP

The team expects infrastructure to grow about 50%. The Director said, “With Nutanix, growth is simple with no need to purchase more than we need. Nutanix has a flexible option to not only add nodes, but to add low and high performance nodes as needed.”

### *Adam Savage, University of Waterloo*

Adam Savage is the Systems Administrator for the University of Waterloo Library. The University is located in Waterloo, Ontario, Canada. He is responsible for all of the Library data-center infrastructure and for its VMware environment.

### PRIMARY DRIVERS TO CHANGE

- **Aging SAN.** Their 7-year-old IBM DS3400 SAN was aging out. NetApp installations were common on campus, and Savage was under some pressure to replace the SAN with a multi-tiered NetApp solution. However, he preferred Nutanix because of a successful VDI project.
- **Growing applications and data.** Current projects and workloads include digitizing physical assets, open source library applications, web services, and ARES software for reserving textbooks. They also run VDI for Library patrons and staff using VMware Horizon View. Savage wanted a new storage solution that would combine scalability, performance, and management simplicity.

### NUTANIX ENVIRONMENT

The Library runs about 90 VMs. A 3360 Nutanix block with three 3000 nodes hosts the Library’s VDI, and Savage has ordered a 4<sup>th</sup> node. Savage replaced the SAN with two Nutanix 6000 series nodes and

two 1000 series nodes. The team will cluster all of the blocks in the same location. The cluster contains 36TB useable capacity, more than tripling storage over the IBM.

Savage said, “We kind of fell in love with Nutanix for the VDI. For the server virtualization side, we did due diligence and seriously interviewed a lot of people. But in the end it was a no brainer for us given our experience with Nutanix.”

### TOP ADVANTAGES

- **Scalability.** The VDI project drove scalability since the deployment would be in two phases: virtualize library user desktops, and later the staff desktops. Savage commented, “In a 3-tier architecture, we would have had to buy infrastructure for both phases up front. That would be a major upfront expense and would take some guesswork for the second phase. With Nutanix, we could buy the infrastructure for the first phase now, and simply add onto it when we were ready for the second phase.”
- **Performance and reliability.** Savage also verified Nutanix’ performance and reliability. They tested several hyperconvergence vendors including VSAN. He said, “Nutanix blew them out of the water in terms of performance, reliability, and usability.”

### WRAP-UP

Savage volunteers to do hyperconvergence presentations on campus and at Nutanix events. He demonstrates Nutanix in real-time, demoing a storage controller upgrade live on the Library’s production system during business hours. He reported, “You wouldn’t even dream on doing this on any other platform, certainly not NetApp’s 3-tier architecture.”

### *Data-center Architect, Global Chemical Company*

This enterprise processes chemicals with offices and work sites located all over the world. Several years ago the company temporarily shifted budget from IT to fund several critical projects. Once the projects were complete, the company brought in a Data-center Architect to modernize the data-centers. Replacing legacy equipment and simplifying management were important strategic components so the team looked to hyperconvergence for next generation infrastructure.

### PRIMARY DRIVERS TO CHANGE

- **Best of breed technology.** The environment contained both VMware and Hyper-V, so the team looked at hyperconverged platforms that served both. He chose Nutanix for multiple hypervisor support, product maturity and market penetration. The company has since standardized on VMware in order to further simplify management.
- **Operational efficiencies.** NetApp storage management required specialized storage engineers across multiple data-centers. Simplified hyperconvergence management allowed the company to simplify its environment and reassign the engineers to strategic IT projects. The Architect said, “We went from an environment that required six engineers to manage, to an environment that needed two and a half. This was nearly a three times improvement.”
- **Lower maintenance costs.** Lowering high maintenance costs were another focus. NetApp already charged high maintenance fees. When the Architect looked at NetApp’s convergence product FlexPod, he found that just one year of maintenance was higher than the purchase price for 3 Nutanix nodes.

## NUTANIX ENVIRONMENT

Nutanix went into production in 2014 and the team has expanded deployment over time. Today 4 data-centers in the U.S., Netherlands, and Australia are running Nutanix blocks with 6000 and 8000 series nodes. The team plans to deploy Nutanix in the South African data-center in the near future.

Applications running on Nutanix include SAP, Dev/QA, BizTalk, Microsoft, and VDI. The team uses Nutanix DR to support service levels by application priority: SOX, Titanium, Gold, Silver, or Bronze. The company is building a dedicated DR data-center in Chicago for SOX and Titanium levels.

In addition to simplified management and consistent DR, the team also reported performance gains from flash-based Nutanix, with 45% overall improved performance over the legacy storage. And although 100% virtualization is not a goal -- many of their plant control systems are based on dedicated physical servers -- data-centers have gone from 27% virtualized to 90% today.

## TOP ADVANTAGES

- **Simplicity.** Highly simplified management features saved significant money on management tasks and maintenance contracts. The Architect said, "We had a lot of NetApp storage. Our storage engineers managed what they could, and we partially outsourced management and maintenance. With Nutanix, we could phase out storage engineers to other projects and canceled our outside contracts. We realized a huge cost savings."
- **Innovation.** The team appreciates Nutanix' software-defined technology. Its innovative Prism management console enables the team to centrally manage servers and storage in data-centers across the world.
- **Support.** The team is very happy with Nutanix support. One of the data-centers experienced a slowdown in the VMware environment. The team called VMware, who stated this was not a VMware problem. The Architect said, "But Nutanix dug in until they found the issue, which was a Cisco firmware issue. It took the Nutanix guys to find the problem so we could fix it."

## WRAP-UP

The Architect cites Nutanix' holistic management approach. "With Nutanix, we don't have to look separately at servers and storage and sites. We can do it all at once, and do it comprehensively."

### *International Law Firm*

This Infrastructure Director oversees data centers, Microsoft environments, and cloud functions for a major international law firm.

The primary data center ran Windows 2012 R2 on Citrix servers and NetApp storage. The servers had aged out and NetApp presented serious performance issues, so the Director and his team searched for a hyperconverged solution with multi-hypervisor support. After looking closely at Nutanix, they did a Proof of Concept in 2015 and deployed Nutanix in 2016. He said, "We're not going to continue to pay for NetApp licensing. We're moving to Nutanix and don't really care what happens to NetApp."

They also deployed Pure Storage for a specific set of high performance workloads running on VMware ESXi. However, since Pure Storage and ESXi are expensive, the Director plans to migrate more workloads from the VMware/Pure environment to the Nutanix/Hyper-V platform. The team will also save money since Hyper-V's native clustering will allow them to drop SQL Enterprise and

adopt SQL Standard. By dropping VMware and SQL Enterprise licensing alone, the law firm will save about \$500K a year in licensing and maintenance costs.

#### PRIMARY DRIVERS TO CHANGE

- **Poor performance.** Although the NetApp storage was only deployed in 2014, performance issues continually plagued the business-critical Windows environment.
- **Technology refresh.** The servers were coming to the end of their lifecycle. Since NetApp presented performance and complexity issues, the IT team decided to adopt Nutanix as their hyperconverged solution.

#### NUTANIX ENVIRONMENT

The firm owns two data centers with about 325 VMs. Their primary center houses 2 Nutanix 3000 blocks and 5 nodes. They plan to buy 3 more nodes for a total of 8 between the 2 blocks. In their secondary DR site, they have 1 3000 block with 4 nodes. They also plan on adopting Nutanix Cloud Connect, which integrates with Azure and AWS. The team is particularly interested in extending applications and data protection to Azure.

Some departments use Commvault but the Nutanix environment uses native data protection tools. The Director said, "Nutanix does a better job than Commvault and it's simple to run. They can replicate snapshots from the primary to secondary data center with their eyes closed."

#### TOP ADVANTAGES

- **Performance.** Nutanix solved NetApp's serious performance problems in the large Windows shop. "With NetApp we had performance problems every day. With Nutanix, we noticed a huge improvement right from day one. Performance is like night and day."
- **Ease of management.** Deployment and everyday management are so simple that the Director was able to eliminate two full-time specialist positions. Upgrades are also an important part of Nutanix simplicity. The Director did the first few upgrades after hours. "I was being careful and tested the waters. Then after a while I asked myself why I was wasting my own time. Now we just do them during the day."
- **Support.** When the Director and his team need support, Nutanix is there with immediate expert response. He recalled, "During our last firmware upgrade we found a problem with our version of Microsoft AOS Server. It was randomly rebooting Hyper-V VMs in the early morning. We created a Nutanix case. Their engineer researched the problem and found out about a bug in an older version of AOS. He put in the fix and upgraded, and the random reboot went away."

#### WRAP-UP

The Director values Nutanix management simplicity for its cost savings. He said, "A junior IT guy can manage the whole solution. Running it is so simple, you can set it and forget it."

## TANEJA GROUP OPINION

Nutanix' product maturity and continued innovation makes it stand out in the hyperconvergence segment and beyond into web-scale technology. This brand of technology is not something you can simply add to existing products and architectures, but takes years of development and focus.

In contrast, legacy storage products like NetApp have fallen behind the innovation curve. NetApp designed its technology over a decade ago on top of spinning disk. At the time NetApp filers were highly innovative but after many years they are being left behind by highly modular, flash-first systems like Nutanix. These new hyperconverged systems handle workloads that were unthinkable a few short years ago.

Customers are tired of expensive infrastructure solutions that are built on complex products like NetApp storage. These customers are turning to Nutanix for infrastructure simplicity and extensibility. From this perspective, Nutanix' "Ease of Everything" is key to achieving a web-scale architecture that is highly reliable and simple to run. This is why data-center directors can confidently adopt Nutanix as their partner in data-center transformation.

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