Nutanix's Hyperconverged Infrastructure for Private Cloud Enables Federal Agencies to Streamline Operations and Improve Management of Large Data Sets

Cutting IT Costs in Half, More Than 1,100 Terabytes of Video Are Searchable and Retrievable in a Self-Serve Environment Across Nearly 50 Sites

Just two years ago, the Federal government caught the attention of the government IT provider and user communities with a "Cloud First" mandate. If the response to this Federal initiative has been variable, it's been only by degree, because there is clearly a strong gravitational pull to the cloud for Federal agencies, and that will only increase.

A key driver in the Federal cloud is a growing list of Federal initiatives. 2010 saw the OMB's *Federal Data Center Consolidation Initiative*, demonstrating a clear push to reduce data center costs. 2014 witnessed the *Federal Information Technology Acquisition Reform Act*, (FITARA), a law requiring Federal agencies to develop long-term strategies for datacenter modernization and mandating yearly reporting of progress. Not to be outdone, 2016 saw the Office of Management and Budget (OMB) bringing clarity to its Cloud initiatives through the *Data Center Optimization Initiative*.

If the initiatives and acts of Congress aren't convincing, the budgetary action speaks volumes. Three years ago, the FY2014 allocation for government data centers was $5.4 billion, and those investments have borne substantial results. The OMB expects the *Data Center Optimization Initiative* to deliver nearly $2.7 billion in savings by the end of FY2018, a remarkable ROI achieved in a short span by any measure, in or out of the government. Cumulatively, this has a direct effect on federal data centers: more than half have recently closed due to modernization and consolidation efforts.

The two-years since the announcement of the Federal "Cloud First" initiative is obviously but nanoseconds in the world of IT. Although the cloud was (and remains) the clear path forward, the term itself is inexact and unproductively all-encompassing. Over just a two-year period, it has taken on multiple meanings, each with subgenres like private cloud, hybrid cloud, etc. That said, it's beyond dispute that cloud solutions have been incrementally perfected by leading IT platform providers for Federal customers and the commercial sector as well. In fact, in a fascinating illustration of the *magic of the marketplace*, Federal customers have voted with their acquisitions initiatives and selected a clear winner from within the competitive landscape of cloud solutions. That is why we have seen the clear emergence of hyperconverged infrastructure (HCI) as the architectural choice for Federal agencies that are modernizing their datacenters.

As evidence of HCI's prevalence, Gartner reports that HCI is the fastest-growing category of datacenter infrastructure. Gartner is not alone. A recent ActualTech Media survey of 1,100 technology professionals saw a 54% increase in a

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year-over-year analysis, an astounding growth path. A study commissioned by Nutanix in 2018 of government IT users showed that 95% of respondents are using some form or combination of cloud in their agency environment, with 48% reporting the use of hybrid or multiple clouds, with 71% of those respondents indicating that this approach works "well" or "very well."

Solutions that deliver services in support of the Federal government are a unique breed, not just because the networks are funded by taxpayer dollars; it's because the services delivered by those IT platforms are so varied, and so often driven by security requirements. These services range widely from healthcare, to transportation, to law enforcement. However, what unifies these solutions is that the users who access them expect – and deserve – rapid, flawless access to the network, on-demand 24/7, all through IT flawless, highly available, high-performance systems; hence the preference for HCI.

HCI reduces complexity and the inefficiency of having three-tiered siloes, so common in legacy IT systems. By selecting HCI, history shows that reliability increases, operating costs rapidly decline, and user-experiences rise. Moreover, HCI allows for increased virtualization and migration of the entire IT platform to the Cloud. Combining critical performance elements in a single IT platform, HCI offers virtualized computing, virtualized networking, and software-defined storage. As much as HCI has emerged as the clear platform type for Federal agencies, there has also been a clear leader selected in the market place of provider, and that leader is the Nutanix Enterprise Cloud solution.

Proof Point: A Big-Data/Data Center Modernization Case Study

THE CHALLENGE

Of all the Federal agencies that require a high-fidelity IT platform for storage, security, and computing, those whose missions are public safety and law enforcement have some of the most stringent requirements. At the Federal level, the landscape is highly distributed across all 50 states, with collection and consumption of vast amounts of data. Not only is there a general need for Federal records to be highly secure, available, and searchable, but those records must often be compartmentalized in idiosyncratic ways. Adding to these challenges, many of the records pertaining to law enforcement are potentially evidentiary. This means that records may be subject to far-reaching subpoenas; some subpoenas can even involve the functioning and structure of the IT platform itself. Further adding to these entanglements, any person who has access to the data may be subject to subpoena as well, which may include the IT contractors, should the work not be properly and rigorously compartmentalized.

In a recent case study of a Federal agency that selected Nutanix Enterprise Cloud solution as its IT platform, these challenges were encountered head-on, with Nutanix offering a correspondingly broad-range solution. Specifically, the Nutanix Enterprise Cloud was implemented across nearly 50 field-offices, and at agency headquarters, where Nutanix enabled management of an expansive video data repository, where data is continually collected from field operations. Here are some specifics of how Nutanix met the challenge:

Scale: The scale of the storage management challenge is enormous, and it extends across multiple sites in multiple states. On an average daily basis, each of nearly 50 field offices manages upwards of 20 to 25 terabytes of video data in storage. The environment is dynamic, as demand for local storage is continually growing to meet ongoing data collection needs. Containing datacenter sprawl was a key requirement, as was optimizing system administration needs across the remote sites.

Feeds: The data is collected from as many as 5,000 sources – some fixed and others temporarily placed in tactical settings or mobile.

Evidentiary: As with any law enforcement activity, the data may be evidentiary for prosecution and defense. Accordingly, it must be maintained in a highly secure environment that is demonstrably tamperproof.

Data stewardship: The stewardship of the data ownership must be maintained in a storage system that could potentially be challenged in an adversarial manner during criminal proceedings. So, it requires heightened sensitivity to security.

Searchable: Operational data analytics and management are implemented through a domain-specific, enterprise application. The data must be searchable and retrievable, not only at the field office level, but in a system-wide

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view as well. Search is now accessed through a self-service portal that can offer access to any part of the full environment, or just a fraction of it, depending on security authorization. With the volume and velocity of data being collected, this kind of performance requires extraordinary capabilities of an HCI platform, and it is one of the key reasons that Nutanix Enterprise Cloud was selected.

Legal Risk of the IT Contractor: The IT contractors who manage the storage system risk being subject to subpoena if they interact with the video data in anything but an administrative manner. The Nutanix Enterprise Cloud allows for that administrative role to be maintained and segmented from the video records storage and management.

Streaming: Finally, the videos must be able to stream on mobile devices and laptops, all accessed through a secure, credentialed portal.

The Solution

Using Nutanix Enterprise Cloud, this Federal agency is able to leverage web-scale engineering and consumer-grade design to natively converge compute, virtualization, and storage into a resilient solution with machine intelligence. Built on a patented, scale-out architecture, the Nutanix Enterprise Cloud OS delivers predictable cost and scalability even for the taxing storage and search workloads described above, all while delivering high availability. In the proof point described herein for this Federal law enforcement agency, Nutanix Enterprise Cloud has improved end-user satisfaction by enabling superior application performance, while cutting IT costs dramatically.

Nutanix Prism: A key component of the solution delivered to this agency is Nutanix Prism, an end-to-end management capability for virtualized datacenter environments that streamlines and automates common workflows, eliminating the need for multiple management solutions across datacenter operations. Nutanix Prism is powered by advanced machine learning technology; it analyzes system data to generate actionable insights, while optimizing virtualization and infrastructure management as a matter of course. By simplifying and centralizing management functions through Nutanix Prism, incremental resources (mainly storage) can be added dynamically to remote sites without requiring dedicated and specialized on-site IT staff. Nutanix Prism also provides the AI tools for analyzing the agency's existing needs and predictive recommendations for expansion that suit the mission, even as it expands dynamically over time.

Nutanix Acropolis: Another feature of the HCI solution is Nutanix Acropolis, a distributed multi-resource manager, orchestration platform and data plane. This distributed data plane for VMs and container-based applications runs across a cluster of nodes delivering enterprise storage and virtualization services. The Nutanix platform is fault-resistant, with no single point of failure and no bottlenecks. A shared-nothing architecture – where all data, metadata and services are distributed to all nodes within the cluster – is built to detect, isolate, and recover from failures anywhere in the system for an always-on operation.

Enterprise Application Support: Common workloads for Nutanix are Big Data and Enterprise Applications. In this case, the Big Data workload consisted of massive amounts of collected video data, and the key enterprise application is a video management system used to collect, archive, and analyze the video streams. The Nutanix Enterprise Cloud provides storage and data access anytime, anywhere, securely. Nutanix support of Big Data workloads improves speed and scalability in a secure environment, which helps to consolidate video archives and information for immediate use. The solution also enables compliance with various government mandates for disaster recovery, data security, and data retention.

Vendor Agnosticism: As a 100% software-driven solution, Nutanix gives customers freedom of choice to repurpose existing hardware to extend lifetime ROI or incrementally grow their environment with commodity server components. This vendor agnosticism extends to the virtualization features as well. Customers can incorporate existing investments or preferences in virtualization platforms such as VMWARE's ESXi or Microsoft's HYPER-V, or consider utilizing the included Nutanix hypervisor, AHV. In this particular case, some sites continued to run the legacy virtualization platform, while others employed AHV. Given the success of AHV, the customer is able to roll out AHV to more sites over time to reduce ongoing licensing and support costs.

Although packed with technology, the Nutanix Enterprise Cloud is such a seamless solution that seems to make the underlying technology invisible.

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The Results

Results: The system administrator reports that OPEX has been cut in half at each location, consistent with ROI performance goals cited in the *Data Center Optimization Initiative*.

No more physical servers to manage: Prior to the Nutanix solution, the local video techs at each of the nearly 50 remote sites were called upon to also manage the local servers and storage arrays. With Nutanix Prism, management is performed centrally by a very small team of four employees which frees local staff to focus on their primary mission and reduces the need for additional IT staff headcount at the remote sites.

User transparency: Users log in to the video-as-a-service private cloud, and they access the video for the pertinent legal cases according to their security privileges. It really is that simple.

Localized High Availability: With resilience built into the Nutanix solution, users report orders of magnitude improvement in data availability, and related time savings.

Datacenter Density: In initial deployments, the agency saw rack unit density improve by approximately 75%.

Management Simplicity: In addition to the manpower savings mentioned above, the administrative team also highlighted Prism's ability to expand a cluster with one-click simplicity and deploy a new remote instance in less than an hour.

Support: "Our consistent experience is that the support from Nutanix has been phenomenal," a network technician reports. "Nutanix is quick to get on the phone, and each and every contact has been fully knowledgeable, swiftly resolving problems. In comparison to our other IT vendors, Nutanix clearly is a standout."

The extraordinary demands of this Federal agency are of national scale, across nearly 50 sites; it's a clearly demanding IT challenge. Here, as in other Nutanix implementations, the demand for services, and the need to do it in a cost-effective manner, drive the clear choice of HCI as a solution. When the "customers" are law enforcement agents, they are owed nothing less than top performance in a secure environment they can fully trust. That's what Nutanix has provided through its hyperconverged network approach.