UNH BUILDS SDDC TO SUPPORT DEMAND FOR INDIVIDUALIZED NETWORK & SECURITY SERVICE

University of New Hampshire

INDUSTRY
EDUCATION / ACADEMIC INSTITUTIONS

LOCATION
DURHAM, NEW HAMPSHIRE

KEY CHALLENGES
- New IT services and applications across all colleges required frequent changes to physical network.
- Data centers were out of rack space, power, and cooling capacity.
- Workload provisioning processes across multiple IT teams did not scale with growing demand.

SOLUTION
VMware NSX provides increased efficiency and CAPEX savings along with improved security for their SDDC environment increasing flexibility and agility opening doors for new revenue opportunities.

BUSINESS BENEFITS
- Adopted zero-trust security posture across datacenters using micro-segmentation, increasing security capabilities and mitigating risk.
- Streamlined operations across multiple IT teams, reducing deployment times for new applications from months to days.
- Reduced spending by avoiding major data center upgrades of network hardware, power, and cooling.

The University of New Hampshire (UNH) deployed a Software-Defined Data Center (SDDC) featuring VMware NSX® network virtualization that allows network administrators to easily segment and isolate traffic. The solution helps UNH deliver virtual machines and multiple individualized virtual networks to each college on multiple campuses—with no additional hardware in the data center. UNH slashed deployment times for new apps from months to days, decreased hardware costs, and reduced the risk of regular changes to the physical network.

The University of New Hampshire, founded in 1866, provides comprehensive, high-quality undergraduate and graduate programs. With a main campus in Durham, a college in Manchester, and a law school in Concord, this growing institution includes dozens of academic departments, interdisciplinary institutes, and research centers that attract nearly 16,000 students and 6,700 faculty from around the world. The University also provides certain centralized services for the University System of New Hampshire and its member institutions: Keene State College, Plymouth State University, and Granite State College.

The Challenge

Universities and colleges view rising student enrollment as a sign of success. Yet more students increase the demand for IT services and technology infrastructure.

At UNH, the problems created by an expanding student population were compounded by the rapid introduction of new offerings and initiatives. The University has a centralized IT organization and data center that hosts most of its servers. Additionally, there are remote servers distributed throughout the campuses and colleges that are supported by localized IT staff. Because of this, there are varying network and security service requirements that need to be addressed.

IT administrators were frequently creating VLANs for new applications due to new security requirements, resulting in increasing complexity of the network and increasing power and cooling requirements. Adding more hardware to the network was not a viable option—the university's limited budget didn't have room for new equipment, nor for the additional personnel that would be required to manage an expanded network. In addition, a strategic goal of the University is its commitment to Sustainability. In keeping with that goal, UNH IT seeks to reduce power and cooling needs whenever possible.

The university's IT department was faced with keeping up with the growing demand for services. A complicated deployment process for network services

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>
> MATT CONNORS
> VMWARE SYSTEM ENGINEER
> UNIVERSITY OF NEW HAMPSHIRE

VMWARE FOOTPRINT
• VMware NSX
• VMware Horizon Enterprise Edition
• VMware vRealize Log Insight
• VMware vRealize Automation
• VMware vRealize Operations
• VMware vSphere Enterprise Plus

NETWORK AND SECURITY SERVICES VIRTUALIZED
• Workload segmentation

PARTNER
• EchoStor Technologies

slowed provisioning times and hindered the team's responsiveness. Deploying a new app often took several months or longer. "There were a number of app requests that we couldn't fulfill at all because of security concerns as well as resource contention," said David Bird, lead system administrator for UNH. "And every configuration change increased the risk of service interruption to the physical network."

The Solution

UNH needed a solution that would support on-demand service provisioning without compromising network security and provide for future growth opportunities as a service provider. In order to scale, the university's IT leaders favored a software-defined network solution that could create secure network segments without adding more hardware. With 12 years of experience using VMware products such as VMware vSphere® server virtualization, VMware Horizon® desktop and application virtualization, and the VMware vCloud Suite® platform including VMware vRealize® Automation™ and vRealize Operations™, the team considered the VMware NSX network virtualization platform to be the logical choice when evaluating Software-Defined Networking.

"VMware solutions have radically changed our data center design," said Matt Connors, a VMware system engineer at UNH. "We consolidated 500 physical servers into 80 and we now run thousands of virtual machine workloads. When VMware introduced the NSX network virtualization platform, we knew it was a good match for our needs."

Partnering with EchoStor Technologies, a data center solutions and services provider, the university moved from a proof of concept to full production in just nine months. EchoStor also helped the UNH networking team understand the new virtualization and segmentation technologies. Using a soft rollout process, UNH now deploys all new network and security services with VMware NSX.

EchoStor Technologies solution architects designed the VMware NSX solution to customer requirements and explained technical details in clear and concise terms to the network, security, and systems administration teams. "The alignment between teams was critical to our success and speed of deploying", said Bird. "Plus, a two-day NSX workshop offered by VMware system engineers also opened our eyes to everything it could do for us, defining clearly how we should implement and the value of protecting our network and data."

Business Benefits

UNH quickly realized technical and business benefits from the VMware NSX deployment. "With micro-segmentation, we have removed the 'air gap' requirement from systems that previously had to remain isolated," said Connors. "VMware NSX allows us to isolate workloads running on the same host without compromising functionality."

UNH can consolidate hardware clusters while still proving compliance with regulatory mandates such as those required by the Payment Card Industry (PCI) or the Health Insurance Portability and Accountability Act (HIPAA). VMware NSX provides VM-level firewalling and logging thus allowing workloads to run securely on the same host and remain fully separated for compliance needs. vRealize gives any audit "…end to end visibility of physical and logical network topologies as they related to single VMs and multi-VM applications". This gave UNH the opportunity to unshackle underutilized hosts in compliance clusters and join them to clusters that needed more hosts and resources.

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The NSX integration with vRealize Operations and Log Insight™ has provided enhanced network visibility, analysis, and troubleshooting capabilities to help administrators identify problems that previously would have gone unnoticed. The IT team can now automatically segment and remediate any problematic virtual machine in their environment. In case of an attack, UNH is able to spot and correct problems within minutes, before any damage is done. "The OOB alerts and dashboards of Log Insight are helping us with figuring out incoming and outgoing traffic," said Bird. Log Insight is "…significantly easier for us to use. We don't have to write custom SQL queries. We don't have to understand log syntax from various sources. Log Insight ties it all together for us nicely," said Connors

To date, the university has reduced or avoided a considerable amount of operating and capital expenditures. Every avoided security incident saves significant time and effort from multiple IT teams. In addition, UNH was able to delay a major data center upgrade with VMware NSX by consolidating virtual machines and extending the use of existing hardware. "We delayed spending $136,000 on blades, $500,000 to $1 million on new network equipment, and $500,000 to $1 million on additional power and cooling systems," said Connors. "That's the power of VMware NSX."

Like many Universities, the budget model for all IT is not centralized. "Some departments on campus get their own IT budgets which lends itself to rouge IT under someone's desk or in a closet.," said Bird. Now they can onboard new services and apps within days even hours with VMware NSX and vRealize. When the schools understand that they can get resources and applications cheaper and quicker for their applications, they are more inclined to use the UNH central IT secure data center. Speed of delivery and showing utilization and lower costs back to the schools is crucial in UNH's transformation into a broker of services.

"We haven't really needed to look for any other solutions in the data center since vRealize and VMware NSX," said Connors

Looking Ahead

Building on its successful VMware NSX deployment, UNH is now capable of providing secure multi-tenancy for its many schools. Looking forward, UNH aims to become a provider of IT services for regional K-12 schools, municipalities, and local government agencies. Their goal is to provide new revenue sources for the university by transitioning to a broker of IT services for multiple constituents. In addition, UNH is looking internally to expand VMware NSX use cases outside of micro-segmentation and IT automation. Integration with VMWare Horizon for secure end user experiences, and vRealize Automation for even faster provisioning times with integrated business processes and approval workflows are targeted for the future. The SDDC will ultimately be backed by VMware Virtual SAN™ enabled vSphere clusters. "It's proof we continue to gain more from VMware," said Connors. The university is also considering hosting disaster recovery workloads from sister institutions or create a public cloud infrastructure using the VMware vCloud® Air™ platform.

"No matter where our workloads run, VMware will serve as the network platform and management infrastructure," said Bird. "We're just beginning to realize the value our VMware solutions can deliver. We like that we have all solutions under the VMware umbrella so we don't have to jump between environments."

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