USC Marshall School of Business Supports Educational & Research Projects with Nutanix Enterprise Cloud

Nutanix Hyperconverged Platform Provides the Ability to Quickly Deploy Compute Resources to University Staff, Faculty, and Students

BUSINESS BENEFITS

Nutanix Enterprise Cloud simplifies infrastructure deployments and ongoing management. By migrating from blades to the hyperconverged solution, the University was able to cut its data center footprint and power consumption at the University's colo facility in half. The end result is the increased ability to support faculty research projects and improve student learning outcomes.

> "Nutanix frees us up to be more responsive to our staff and faculty and support their research needs. Now when I need a new server, I just slot it in, plug it into the network connections, and I'm done. It's really easy to be an IT hero with Nutanix."
>
> – Dan Lewis, Associate Director of Operations and Infrastructure Services, USC Marshall School of Business

INDUSTRY
Higher Education

CHALLENGES

- Existing 3-tier infrastructure was complex and time-consuming to manage
- IT team was unable to deploy new compute resources to faculty, students, and staff in a timely manner
- Wanted to reduce datacenter footprint and power consumption to meet university's 'green' initiatives

SOLUTION
Nutanix Enterprise Cloud Platform

- Acropolis Software
- Nutanix NX appliances
- Prism management plane

Applications

- VMware Horizon desktops
- Microsoft SQL, Exchange, SharePoint
- Java, web apps, domain controllers, DNS
- Cohesity backup software
- Faculty research and student learning applications

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CHALLENGE

The University of Southern California (USC) Marshall School of Business had been using traditional servers to provide compute services and applications to all of its staff, faculty, and students. "We virtualized the majority of our physical servers several years ago," explained Dan Lewis, associate director of operations and infrastructure services at the USC Marshall School of Business. "But even with all of the cost and management savings we got out of virtualization, maintaining the traditional server environment was still very time-consuming. We had to make sure everything was on the same firmware, with the same configurations, and then tackle all of the cabling, racking, and other challenges that come with three-tier infrastructures. Because of that complexity, we were not able to get applications up and running as quickly as our end users would like."

USC switched over from its standalone servers to a blade server environment in 2015. "Moving to blades mitigated a lot of the complexity of our standard server environment, but there was still a lot we had to do to maintain the blade ecosystem. In order to set up and configure the environment, we had to coordinate the efforts of our server admins, our network team, and finally, our storage specialists."

The infrastructure complexity translated into long delays when responding to requests from end users. "Our staff and students always want everything delivered immediately," said Lewis. "The business school's faculty are also desperate for CPU cycles, so they don't have to run their research projects on their under-powered desktops. We also have PhD students who need compute power. They don't enough money to go out and purchase their own systems, they have to rely our infrastructure to do their research properly. And even when we were able to stand up a single virtual server relatively quickly, adding more capacity could take months."

SOLUTION
Looking at Converged Solutions

USC's IT team began looking for new infrastructure solutions in 2016. "We started by looking at converged solutions when they first came out, but they weren't intended for smaller organizations like ours," noted Lewis. "We only run about 150 servers and 300 virtual desktops, and those solutions were all rack-sized —they didn't fit either our budget or our datacenter space constraints. Plus, a converged solution was still a very new concept at that point. No vendor really had a handle on the technology needed to make sure everything was reliably doing what it was supposed to do."

A Speedy Deployment

The Nutanix deployment went very quickly, according to Lewis. "After configuring the network, everything just started clicking — it was amazing how fast everything was getting done. The whole process took just a couple of weeks. With a blade environment or standalone servers, you have to be extremely careful about what you do and when you do it. But you don't need a highly trained technician to deploy and manage Nutanix. I could probably train one of my kids to install the systems in less than a day!" USC Marshall School of Business is now running all of its student and faculty research applications, MS SQL, Exchange, SharePoint, Java, web apps, domain controllers, and DNS on Nutanix Enterprise Cloud infrastructure.

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Choosing Hyperconverged

After ruling out converged solutions, Lewis decided to investigate some of the newer, hyperconverged infrastructure options. "There were several vendors in the hyperconverged space at that time, but everyone was doing pretty much the same thing," he said. "They all offered a standard CPU, coupled with some networking components and storage hardware, but the piece they were all missing was the 'secret sauce' — the software that sits above the virtualization layer and physical infrastructure that abstracts and manages everything. That's the magic piece that enables a solution to deliver what the HCI ecosystem promises."

After reviewing the hyperconverged options, USC chose Nutanix Enterprise Cloud. "In terms of maturity, Nutanix was far ahead of all of the other HCI players," Lewis said. "HP, for example, was just taking their regular servers and rebranding them as 'hyperconverged' by adding on a front end. But they didn't provide all of the functionality needed to be considered a true HCI solution."

"We were really impressed with Nutanix, and how quickly we could get everything set up in a compact environment without sacrificing any performance," said Lewis. "That was the gating factor for us, because if we were going to switch to an all-in-one system, it had to be powerful and resilient. The solution had to be able to survive node failures, but also block failures and network failures. Nutanix Enterprise Cloud was the only platform that met all of our requirements."

CUSTOMER OUTCOME
Eliminating Complexity

The simplicity of the hyperconverged infrastructure has enabled USC's IT team to focus on reliability and other critical infrastructure maintenance projects. "All of those steps we had to go through to build and maintain our previous 3-tier systems completely went away," Lewis said. "In our standalone server environment, each of our servers had at least two power connections, two Fibre Channel connections, and two to eight network connections coming out of the back of each server. We had to make sure we kept all of the cables bundled up neatly, so if anyone moved something, it didn't pull everything apart."

After USC migrated from standard servers to blades, some of the cabling and management tasks went away. "Moving from standard servers to blades simplified our environment a lot, since the blades come pre-cabled," Lewis explained. "But the back of each blade chassis still had multiple Fibre Channel connections coming in and going out. We really wanted to get away from managing an entire Fibre network along with our regular network."

Lewis and his team briefly thought about going back from blades to regular servers until hyperconverged came into play. "HCI reduces cabling even more than blades," he said. "With HCI, you only have a couple of network connections coming out of the back each node, and that's it. It takes all of the labor and pain out of having to re-cable things."

Providing Better Service to Faculty, Staff, and Students

"Nutanix frees us up to be more responsive to our faculty and support their research needs," Lewis said. "It used to take a couple of months to fulfil any faculty requests. We can now get everything done in a couple of weeks, and most of that time is actually spent on paperwork. We now have the time to sit down and talk to them about their strategic compute needs, and can deploy new services for them in a timely manner."

"Adding capacity is easy with Nutanix," Lewis explained. "You just throw another node in, hook it up to the network, and you're done. We actually had one faculty member who insisted on buying his own server, and then asked us to deploy it for him. With just one standalone server, it took him almost eight weeks to procure the hardware and for us to get it up and running. A few weeks later, another professor requested a similar research environment, so we asked him if he would be willing to use our virtual environment with hyperconverged infrastructure. He was initially concerned that he would be sharing computer resources with other faculty research projects, but agreed to give it a try. We were able to turn his project around in a just couple of days, and he was thrilled with it. And with this professor's environment, we can easily add capacity whenever he needs it, unlike the first professor who bought his own system."

Non-Disruptive Upgrades

"Our blade infrastructure upgrades took six weeks and required us to schedule two downtime windows while we took everything offline," said Lewis. "In contrast, our last Nutanix upgrade took only three business days — with no downtime at all. And the only reason it took us three days was because we were being super cautious. It's great that we can upgrade our systems without having to schedule maintenance windows anymore."

Deploying Virtual Desktops

USC deployed a VMware Horizon virtual desktop environment for its business school students in 2017. "It took us almost a year to get the virtual desktops deployed on our blade architecture," said Lewis. "Once we finally got the desktops up and running, it was great. But anytime we needed to make a change or upgrade the hardware, it was a very time-consuming and piecemeal project on the blade servers. With all of the time and effort required to manage that environment, it didn't seem like we were getting enough return from our VDI investment."

USC is now running VDI on Nutanix. "Obviously, we learned a few things during the initial VDI deployment on the blade hardware, but it only took a couple of weeks to get everything going with Nutanix. It's absolutely amazing for us to be able to turn a project of that size around in that amount of time."

Providing Virtual Desktops to All Students

"We're now at a point where we can give every single student that walks in the door their own virtual desktop," said Lewis. "I don't think I would be able to meet that demand if I didn't have a hyperconverged infrastructure — I would be buying additional blade servers and chassis every chance I could. But with hyperconverged, I only have to add more whenever I actually need it. In the 'old days', we had to buy five times more than we thought we would need just to be safe, and then we would end up wasting a lot of money. I don't have to over-provision anymore with Nutanix."

Approximately 80% of USC's business school students are using Mac desktops. "Our biz school students love their Macs, but I know that the majority of the companies they are going to work for will be using PCs," said Lewis. "It's great that I can provide a desktop to every single one of them, so they can learn how to use MS Excel on a PC. Whether they like it or not, it's a valuable skill they're going to need in the business world. And the fact that I can easily scale that up to meet everybody's needs in such a short period of time is astounding."

Cutting Rackspace in Half

The move to Nutanix has enabled USC to significantly reduce its datacenter footprint. "We were using HP C-class blades," Lewis said. "But those systems consumed a lot of power and rack space. We went from eight racks of blades to just four racks of Nutanix. Our blade chassis alone took up 20u, and we have replaced those with two Nutanix nodes that fill just 4u. We also went from a full-blown tape backup environment with off-site storage, to a hyperconverged Cohesity backup solution. It's a 2u box that does everything that two full racks of equipment did before. Getting rid of all of those racks is saving us a lot of money and cutting down on power consumption. That's great, since 'going green' is a big campus-wide priority for USC now."

NEXT STEPS

"I've been at USC 20 years, and the biggest shift I've seen is the increased expectation of IT resources from our end users," concluded Lewis. "We now have an ecosystem where faculty and students aren't hesitant about asking us for compute power any more. If a faculty member needs a research environment or a student wants to use a particular app in class, with the blade architecture our answer used to be, 'Maybe, but probably not for a few months.' With Nutanix, it's, 'Of course we can do it! How soon do you need it? It's really easy to be an IT hero with Nutanix."

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