Oregon State
UNIVERSITY

OSU

INDUSTRY
Education: Academic Institutions

LOCATION
Corvallis, Oregon

KEY CHALLENGES
- Existing storage couldn't handle peak-level virtual desktop infrastructure (VDI) workload traffic.
- Manual resource rebalancing couldn't compensate for increasing load.
- Budget restrictions prohibited purchase of traditional external SAN.

SOLUTION
The VMware Virtual SAN product is a scalable, software-defined storage tier for VMware vSphere® environments. The Virtual SAN solution clusters server disks and flash to create simple, high-performance, resilient shared storage for virtual machines.

BUSINESS BENEFITS
- High-performance storage capable of handling write-intensive VDI workloads
- Easy to manage through VMware vSphere Web Client
- Scalable solution that is budget friendly

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Oregon State University Solves Critical Storage Pain Points with VMware Virtual SAN Solution

The IT department at Oregon State University manages two open-use computer labs and one computer-equipped classroom. Because of financial restrictions, the university had originally purchased all of its servers with local storage, but that infrastructure could not handle the school's growing workloads, and it required time-consuming upkeep. The university turned to the new VMware Virtual SAN™ product, which addresses these and other concerns while offering a simple and scalable solution that fits within its budget.

Oregon State University is a public institution with more than 26,000 students from all 50 states and more than 90 nations. Located in Corvallis, Oregon, the university is one of only two in the United States to be designated a land-, sea-, space-, and sun-grant institution, which makes it eligible to receive special funding for research in these areas. The university is known for its health, engineering, natural resource, and science programs.

The Challenge

Oregon State University's computer lab infrastructure was procured over time. With the increasing use of technology in the curriculum, the loads placed on the computer lab infrastructure were outpacing bandwidth.

"I had spec'd out for a continuous user cycle of five to 15 users at a time," says Alan Sprague, the university's system administrator. "But now we're seeing a 50-user turnover in 10 minutes. The system couldn't handle that load."

The three-person department tried to manually balance the load over four servers and 12-plus network pools, but the system still experienced outages or "boot storms" (a loss in service during peak usage), requiring as many as 20 minutes for users to log in. Beyond that, system maintenance was extremely time-consuming, with a full recompose (a reset of the virtual desktop) taking as long as 10 hours.

"The memory load went way up; the turnover load went way up; we were running out of IOPS; and we couldn't balance properly because it was all local storage, which clearly doesn't work," recalls Sprague. "It was a perfect storm."

Sprague knew he couldn't add more desktop storage; the lab environment is far too dynamic for that. Yet the cost of a traditional storage area network (SAN) that could meet the university's requirements of 130 to 170 concurrent users was simply not in the budget.

"There was no way for us to add resources in a logical way," he says. "It would just be throwing money at the problem without really solving the problem. We had to find a better solution."

The Solution

Sprague briefly considered a Nexsan SAN storage array, but it was a hardware-based solution that would require a significant up-front investment. He also considered

VMWARE FOOTPRINT

- VMware Virtual SAN
- VMware Horizon View
- VMware vSphere
- VMware vCenter™

PARTNER

- Dell Inc.

other all-flash and hybrid solutions. "But I'm a huge fan of VMware's software-defined storage vision," he says. "It's where the market is going."

So when the VMware Virtual SAN product became available in March 2014, he jumped at the opportunity. "It was very similar to what we were looking at, but now [the capabilities are] baked into the hypervisor right at the kernel level, which is significantly more efficient than what we use today," notes Sprague. Plus, it's designed for use with other VMware products, such as the VMware Horizon® View™ solution, already in use at the university.

Sprague didn't have the time or resources to conduct a proof of concept—the system had to be online before the Summer 2014 class session began so it could be tested and refined with lighter workloads. With help from VMware technical support and other early adopters of the product, Sprague installed the Virtual SAN solution for 190-plus desktops over just three network pools. The pools deployed in about 20 minutes. "Two clicks and you're done," Sprague says. Integrating an additional server took just four hours.

"It was the perfect solution to allow us to take advantage of all the storage we already purchased as well as dramatically increase the performance of the current system without having to spend $100,000 on a new SAN," Sprague says.

Business Benefits

The Virtual SAN solution went live on June 20 with great success. Once the Virtual SAN software correctly clustered the servers, the Horizon View solution was able to balance workloads for more consistent performance. Now, even with 60 users on a single network pool, there are no boot storms, and users can sign on in under a minute. Sprague expects the same performance this fall when the system is at full capacity of 170 users. Students and faculty will enjoy uninterrupted service, even during peak load periods.

Managing storage is also far easier, giving the team time to work on other critical tasks, such as moving the labs to a brand-new facility this fall. "It's night and day," Sprague explains, noting that the labs can now be recomposed in less than two hours. "And instead of having to do it 12 times, we can do it just three times, which means the number of human errors decreased by an order of magnitude. Our ability to reimage midstream also went way up."

In the future, firmware upgrades will be less risky because there is no single point of failure, unlike with a traditional SAN. Similarly, expanding the system is as easy as adding an additional server. "Before Virtual SAN, we had no ability to scale," Sprague says. "Now there is a much better and more controllable cost per desktop. And it's a piece of cake; if I want to add additional capacity, I just add an additional server. I don't have to worry about whether my SAN can grow or not."

That's good for the budget, especially for a public institution with limited funds. "I can scale one small chunk at a time without having to worry about this huge monolithic SAN that I have to replace in five years," Sprague says. "I can justify $25,000 to $30,000 every year for a new server. That fits into the way the state of Oregon does business."

Looking Ahead

Sprague is already planning for the day when the university can offer ubiquitous, 24/7 student access to the network, so users won't have to be tied to the labs. "That's the holy grail we've been after the whole time, but we didn't have the capacity to do it. We were barely hanging on to our own endpoints," Sprague says. "But now I can generate capacity easily. That's really the next big piece for us."

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