

MANAGING THE CONTENT EXPLOSION



A FIRE AT OUR LADY OF THE LAKE UNIVERSITY SPARKS THE ADOPTION OF A SAN TO CENTRALIZE DATA STORAGE AND IMPROVE DISASTER RECOVERY.

Everybody talks about implementing a disaster recovery plan, but sometimes it takes a near-devastating fire to provide the necessary motivation to finally do it. This was the case with Our Lady of the Lake University, whose IT department was looking at options for centralizing data storage and improving operations continuity when a fire nearly destroyed the campus data center. ▷

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In May 2008, a nighttime fire (caused by an electrical short) ravaged the top floor of the Catholic university's historic Main Building, destroying one of two distinctive silver spires that sit atop the century-old San Antonio landmark.

Firefighters responded quickly, dousing the flames before the fire could spread down to the first floor where the data center is located. While firefighters battled the blaze, IT staffers quickly covered the servers and networking equipment with tarps, turned off the power and removed hard drives to get them out of harm's way.

"We dodged a bullet," says Dave Lytle, the university's director of infrastructure services. "When we got in the next morning, there were a couple of inches of water on the first floor; the ceiling tile was mush and dripping like a rainforest. But the tarps saved nearly all the equipment."

A few switches were destroyed, but everything else was undamaged. The IT department set up a makeshift data center in the library and had applications and the network up and running within a few days. "If we had lost all the equipment, we would have had to replace the servers and restore data from tape, and it would have taken weeks or a month," he says.

This close call spurred the IT department to move forward with its plan to purchase a storage area network (SAN), which separates storage from servers and houses all the data centrally on the network. The technology simplifies data management and improves the data backup and disaster recovery process.

Data Overload

Like other colleges, Our Lady of the Lake University is experiencing an explosive growth of data as the university's faculty members embrace classroom technology and incorporate more multimedia, such as videos, websites, PowerPoint slides and other images, into their classroom lectures. They're even capturing video of the classroom presentations and making them available online, allowing the school's 2,600 students who want to review lectures to access them.

Besides the new academic multimedia content, the IT staff must also manage separate e-mail servers for students, faculty and staff as well as administrative data that includes the campus police database and a document imaging system that includes scanned images of student transcripts and human resources records.

To get a handle on its storage needs, the university purchased and installed an iSCSI-based SAN by Hewlett Packard's LeftHand Networks that features 72TB of raw capacity. The networked storage approach will allow the university's IT department to better utilize storage capacity and bolster reliability and uptime by replicating SAN data across primary and secondary sites.

This way, if a drive in the primary SAN site crashes or the entire primary SAN site is destroyed in a disaster, the secondary SAN site — where a copy of the data resides — will take over.

"With the SAN, data is easier to manage and it gives us the redundancy that we need," Lytle says.

A SAN allows organizations to better utilize storage capacity, says analyst John Sloan, of Info-Tech Research. In most organizations with direct-attached storage, some server hard drives are near capacity, while others are underutilized, resulting in wasted storage.

"A SAN eliminates storage islands," Sloan says. "By consolidating storage into a single pool and making it network accessible, there is more flexibility in utilizing and managing that storage. You add up all the storage in an organization and it could be 40 percent of total capacity being used. You can have capacity for growth and not have to buy more storage every year or replace servers to increase capacity."

FIBRE CHANNEL VS. ISCSI: WHICH IS FASTER?

Fibre Channel SANs no longer hold a competitive edge in speed over iSCSI SANs. For years, Fibre Channel topped out at 4Gbps speeds, while iSCSI SANs offered 1Gbps of throughput. But thanks to technological advances, iSCSI SAN manufacturers now offer 10Gbps speeds.

Fibre Channel technology hasn't stayed static, however. Manufacturers have doubled Fibre Channel's speed and now offer 8Gbps of throughput. In addition, a new networking standard, called Fibre Channel over Ethernet, will make the technology available at 10Gbps.

For its HP LeftHand SAN implementation, Our Lady of the Lake University bonded two 1Gbps connections together for a total of 2Gbps throughput. "Right now, that meets our needs," says Dave Lytle, the college's director of IT infrastructure services.

Our Lady of the Lake University, for example, wasn't regularly maxing out the storage available on the servers. But when it did need to add storage space, the university would upgrade to new servers, Lytle says.

Choosing the Right SAN

Our Lady of the Lake University's IT department considered several SAN options and briefly debated between Fibre Channel and iSCSI before finally settling on HP's LeftHand iSCSI SAN.

The decision to go with iSCSI was a no-brainer, Lytle says. Fibre Channel SANs historically have been the fastest technology available, but building a Fibre Channel network is more expensive and requires IT departments to have Fibre Channel expertise. Lytle's IT unit, which is responsible for network and telecommunications services, e-mail and storage, chose an iSCSI SAN because of its cost, ease of use and the fact that iSCSI SANs run over Ethernet (allowing the university to use its existing network).

"The LeftHand solution just seemed to fit," he says. "We had a better comfort level with the technology. It comes with more built-in management features and it's less expensive."

The Installation

Our Lady of the Lake University purchased a LeftHand SAN solution that includes six Network Storage Module (NSM) 2120 devices, which house 12TB of storage each. LeftHand engineers installed and configured the SAN

earlier this year, connecting it to the university's servers and network.

Since the installation, the IT department has been slowly migrating the university's existing 10TB of data to the SAN. The university has moved data from its core services (including its domain and directory servers) to the SAN, as well as the help-desk ticket tracking system.

Over the past year, the university's instructional technology department, called the Teaching Learning Technology Center, deployed an Adobe Flash Media Player server to manage its multimedia. The IT department has since moved the multimedia data to the SAN.

In autumn 2009, IT administrators will migrate e-mail and the scanned images in the university's document imaging system, Lytle says. The university will also use the SAN to back up its Enterprise Resource Planning data, which includes student records, human resources and other administrative data, Lytle says.

"We've been in test mode, but we should move a good chunk of the document imaging storage and the Exchange data storage by the end of September," he says.

Our Lady of the Lake University's website content and some of its course materials on its learning management system (such as syllabi and assignments) are hosted offsite through third-party service providers and will not be part of the SAN, he says.

With the SAN in place, Lytle plans to offer faculty, administrators and staff network file folders for the first time, which will make it easier for the university to back up data. In the past, university employees stored their data on their computers' hard drives.

"It was decentralized. The users backed up their own data with Flash drives and CD-ROMs," he says. "Now that the users will store documents on their own home directories, they will have confidence that their data is safe and feel less of a need to make backup copies."


One SAN, Two Clusters

Lytle has divided the six LeftHand NSM devices into two clusters of three nodes each, but they collectively act as one SAN. Using a RAID 6 configuration with Network RAID, the primary and secondary sites are continually striping and replicating data over all the six nodes.

That way, if one site goes offline for any reason, the system will failover to the other site. This RAID configuration reduces the total available storage from the raw capacity of 72TB to about 30TB, which is the price paid for this level of data and hardware redundancy, he says.

The technology is simple to use and manage, he shares. LeftHand's management software, for example, makes it easy for the IT staff to provision storage resources and add more storage capacity in the future. When the university needs more storage, the IT staff simply plugs in more NSMs.

LeftHand also offers further data protection through "snapshot" technology, which makes copies of data at regular intervals. The management software also monitors the health of the SAN and alerts the IT staff if a drive needs replacing, he says.



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— Dave Lytle, director of infrastructure services at Our Lady of the Lake University

The two SAN sites are currently housed in the temporary data center in the library. The IT department, with the help of the administration, is in the process of locating a permanent site for the main data center and a site for the second data center. The goal is to have the two SAN sites on opposite ends of the campus for disaster recovery purposes, Lytle says.

“We’re comfortable with the notion of a split-campus SAN,” he says. “The likelihood of an entire campus being wiped out by a disaster like a tornado is not high.”

Server Consolidation

With the SAN implementation completed and data migration in the works, Our Lady of the Lake University has begun work on a separate but related project: server consolidation through virtualization. The university recently purchased new blade servers and VMware’s server virtualization software to consolidate servers.

The university, which currently has about 70 Windows-based rack-mount servers, hopes to virtualize about 80 percent of the school’s applications on eight blade servers. Some applications work better on stand-alone servers and will stay where they’re at, he says.

Office space is at a premium on campus, so reducing the number of servers will make it easier for university officials to find a permanent data center space, he says. Consolidating servers will also reduce energy consumption, which will save money and help the college with its green computing initiative, he added.

The university bought two chassis, which will house four blades each. One set will be housed in the primary data center with the primary SAN site, while the other set will be housed in the secondary data center.

“We are still ramping up, learning VMware and mapping out our virtualization strategy,” Lytle says.

A Helping Hand

Lytle says he could not have purchased and installed the SAN without the help of CDW•G account executives Brian Phillips and Mike Bedard. The pair connected the university’s IT department with LeftHand’s engineers, who educated the IT staff about the technology and discussed their needs.

Phillips and Bedard helped the IT staff schedule onsite visits with other universities that had successfully implemented a LeftHand solution. And after the purchase, they arranged for LeftHand technicians to come on campus to help install the SAN.

“We acted as a partner and liaison and put them in touch with local engineers and account executives,” Phillips says.

CDW•G is an important partner for the university’s computing needs, says Lytle, who has also purchased uninterruptible power supplies and replacement Cisco IP phones from the vendor.

“We give them a call whenever we have a big project on tap and see what they can do for us,” Lytle says. “We’re not a big university, so our budget is a major consideration. And they always do their best to come in well on the price side.”

So far, the SAN has worked out well. The SAN, combined with the server virtualization and consolidation project, will simplify IT management and protect the university’s computing environment from future disasters, Lytle says.

“It’s not cheap, but it’s the way to go,” he says. “The biggest thing that I learned from the fire is: Don’t put things off. We had been thinking about this for a couple of years, and it took something drastic like the fire to get us moving. It was a real wake-up call. Overall, we feel we have a good solution in place. We’re very happy with it. It gives us a lot of benefits in terms of centralizing management, scalability and failover redundancy.” ♦

CONSOLIDATE STORAGE FIRST, THEN SERVERS

Storage and server consolidation are two strategies that go hand-in-hand because they reduce IT costs and result in a more efficient, easier-to-manage data center, says analyst Tim Sloan of Info-Tech Research.

Our Lady of the Lake University used the right strategy in deploying a SAN to consolidate storage first before tackling server virtualization to consolidate servers, Sloan says. Some organizations make the mistake of trying to consolidate servers first. They buy new multicore servers with virtualization software, but forget to address and budget for SAN storage, he says.

Ideally, IT departments separate the storage from the servers first, and then they virtualize their servers, he says.

“Organizations going into virtualization sometimes back into the storage issue. They are looking at processor consolidation and budget for that, but they don’t have a storage strategy hammered out,” he says. “And in the process, they realize they really should consolidate the storage as well.”