

A photograph of two men standing outdoors under several large umbrellas. The man in the foreground is wearing glasses and a light-colored button-down shirt, holding the handle of a large black umbrella with a red top. The man in the background is wearing sunglasses and a dark jacket, also holding a similar umbrella. The scene is set against a bright sky with some clouds.

Data Backup 101

North Carolina's High Point University is deploying a new disk-to-disk storage solution to bolster its disaster recovery plan.

Wellington DeSouza, left
Director of IT
Daniel Farmer
Server Manager
High Point University
High Point, N.C.

High Point University has never had to perform a major disaster recovery, but if it ever does, its IT department will be ready.

The private university in High Point, N.C., recently purchased state-of-the-art disk-to-disk storage technology that will replace its slow tape storage system and unreliable data backup software. Thus far, IT has had to devote almost a full day to back up the college's most critical information, which are Enterprise Resource Planning (ERP) data and e-mail, says Daniel Farmer, High Point's server manager. A full backup of all data takes 36 hours.

The current backup software is finicky and doesn't work with every application, forcing IT administrators to figure out workarounds. The data backup software, for example, does not send e-mail data directly to the tape storage device. So the IT staff uses Exchange's native backup technology to store e-mail on a disk array, then transfers the data to the tape storage device. High Point's IT staff expects the new disk-based storage solution will be fast and hassle-free.

"The old tape backup system was not adequate, but with disk-to-disk backups, data backup and retrieval will be faster and simpler," says High Point's director of IT, Wellington DeSouza.

High Point University, a liberal arts college with about 3,000 students, is joining an increasing number of institutions that are turning to disk-based backup solutions for their data storage needs. In a survey of more than 200 North American IT decision-makers, an overwhelming majority view disk-based data protection as strategic to their storage needs. As a result, the strategy is becoming widely adopted by institutions of all sizes, according to a report by analyst firm Taneja Group, in Hopkinton, Mass.

In fact, 80 percent of medium-sized organizations are interested in disk-to-disk backup solutions, largely because the technology has dropped in price and is more affordable, according to a 2005 survey by analyst firm Enterprise Strategy Group (ESG), in Milford, Mass.

Universities are part of the trend, says CDW•G account manager Mitch Huffington, who works exclusively with higher education. "More and more universities are starting to look at it over the past year. It's a lot easier to use, saves time and the prices are about two to three times lower than about two years ago."

Disk vs. Tape

According to ESG, the biggest issue institutions have with tape backup is poor performance. In its survey, the top complaints of tape-based storage were that backups and recoveries took too much IT staff time and that it was difficult to validate whether backups and recoveries were successful.

In addition, many users could not back up data with tape within their desired timeframes. Disk is much faster, particularly if users need to recover specific files that were accidentally deleted or corrupted. The difference between recovering from disk and tape is comparable to finding a movie scene on DVD as opposed to videotape, the ESG report says.

Still, High Point isn't completely eliminating tape from the picture and has purchased a new tape backup device to serve as archival backup to the college's disk-to-disk solution.

This spring, the university spent about \$64,000 to purchase Overland Storage's REO 9000 Disk-based Backup and Recovery Appliance, which holds 9.6 terabytes (TB) of storage space, and new tape backup equipment, Overland Storage's NEO 2000 Library.

High Point chose EMC's Retrospect 7.5 as its data backup and restoration software. And for hardware, the school selected the Hewlett-Packard DL380 server to run the software, and the McData Sphereon 4500 eight-port Fibre Channel switch, which will connect the HP server with the Overland Storage devices.

To plan for their purchases, the university's IT team made a forecast of their storage needs for the next three to five years. "We recognized that from the volume of growth we will have with data, there was no way we could stick with traditional tape technology," Farmer says. "Our needs demanded new hardware technology and new software to complete the mission that we need to do."

Getting Started

In 2005, the university moved toward purchasing the new disk-based storage solution when DeSouza met with university leaders to determine Service Level Agreements (SLAs) for applications and the acceptable length of downtime for each.

A turning point occurred in October when the college's Exchange Server died. Administrators had not deemed e-mail that critical until the university lost access to its archived e-mail for a week. The experience helped convince the university it was time to invest in new data backup and retrieval technology, DeSouza says. High Point paid for the technology through the tech fees that students pay annually.

When the Exchange Server went down, the IT department quickly restored e-mail services with an empty database in about 10 hours. But it took a week to restore the archived mail in people's inboxes because the existing database with archived e-mail was fragmented, and the defragmentation process took about a week. Had the college had a disk-based storage solution, the IT staff could have restored archived e-mail much quicker, Farmer says.

A disk-based solution will allow the IT department to perform regular maintenance on the e-mail database, which will reduce its size and fragmentation, Farmer explains. "Our present backup technology is simply not stable and consistent enough to do regular deep maintenance. The new technology promises to help with this by vastly increasing our backup throughput."

Benefits of Disk

High Point backs up data that resides on 20 servers with the most critical data housed in about eight servers, Farmer says. University leaders have determined that their two most important applications are ERP and e-mail. The ERP software houses financial data, grades, transcripts and class schedules. The university also backs up faculty and students' network drives, as well as the school's Web sites, custom applications, device configurations and multiple databases.

High Point's IT department will deploy the new disk-based storage system this summer. The IT staff will install the EMC Retrospect software onto the HP DL380 server. They will link the server to the McData Sphereon 4500 Fibre Channel switch, which in turn will connect to the REO 9000 disk storage device and the NEO 2000 tape storage device.

The REO 9000 is a disk-based solution that stores data in a "virtual tape library," meaning that it emulates a tape-based system, making it easier for IT administrators to manage the data, Farmer says.

Once the data is stored on the REO 9000, the university will back up that data onto the NEO 2000.

High Point backs up its most important data in the middle ▶

of the night, from Monday through Wednesday, and performs full backups on weekends. The ERP data, which totals 8 gigabytes of information, and e-mail, which consists of 2TB of data, takes about 24 hours to back up. With the old tape system, backups continued during the daytime hours, affecting network performance.

Farmer expects data backup will be four times faster with the new disk-based system. Tape drives can only do one backup at a time, while disk-based storage drives can perform four to six backup jobs at the same time, he explains. As a result, the new storage technology will reduce the amount of network traffic during regular school hours.

“Today, whenever a backup service bleeds into business work hours, the combination of massive backup disk access and network traffic bog down our servers’ responsiveness and availability,” DeSouza says. “Disk will interrupt the business far less.”

Once the new technology is installed, High Point still will use the old backup system for six months while the IT staff tests the new technology and performs recoveries to make sure the new system works, Farmer says.

CDW•G’s Role

Once High Point decided on their new disk-to-disk-to-tape storage solution, the university turned to CDW•G. When Huffington, the college’s CDW•G account manager, was contacted by High Point, he could tell that DeSouza and Farmer had done their homework. He put them in contact with a CDW•G storage engineer who helped the university configure a complete solution by suggesting EMC Retrospect software.


DeSouza and Farmer contacted two other reseller partners, but chose CDW•G because of its customer service and price.

“CDW•G had extremely good pricing and outstanding customer service. That’s the thing that stood out above the competitors, and it’s their willingness to work with us,” Farmer says. “CDW•G is more like a family member. They helped educate us and made us more comfortable to make our decisions. They didn’t suggest this is the only way to do it, but rather that it was based on their experience with other clients.”

DeSouza says he sometimes gets price quotes from other companies, but buys from CDW•G. “We need to make sure everyone is kept honest, and time and time again, we keep going back to CDW•G,” he says.

The Future

Once the new system is installed, Farmer expects the technology will revolutionize the university’s data backup and retrieval process — and protect the university from any disaster that could come its way.

“If you’ve been around 20 or 100 years, your data is part of who you are. It represents your relationships. If you lose it, you lose your relationships. And if we lost all our data, we could potentially lose our accreditation and go out of business,” he says. “We’re safeguarding ourselves from something horrible and tragic. And if we had to recover from something, we won’t be starting over. With data intact, we are picking up as close as possible to where we left off.” 





Tips on Safeguarding Data

Data storage is critical to any disaster recovery plan, but other facets are also important to create a foolproof continuity strategy, say High Point University's IT leaders.

Before implementing technology, the IT department first must determine what the university's most critical IT functions are, so they can develop a service recovery plan in case of a disaster, says Wellington DeSouza, director of IT at High Point. That requires IT and university administrators to determine Service Level Agreements (SLAs).

For example, users might not think an application, such as e-mail, is critical, DeSouza says. To help university administrators rank the most important technology services and applications, IT staffers should ask hypothetical questions, such as, "What would happen if e-mail were down for a day or even a week?" This way, says DeSouza, "users will have a different perspective on what is critical to them."

After ranking the most critical IT functions and hashing out SLAs, the IT department must explain to university administrators that the SLAs require an investment in technology, DeSouza says.

When choosing technology, institutions should install a disk-based system and a tape storage system to serve as backup, adds Daniel Farmer, High Point's server manager. The IT staff should store the tapes in a safe place. High Point, for example, stores its tapes in a fireproof safe on campus.

Because disasters can wipe out key campus resources, it's also important to store data offsite, Farmer says. High Point's IT department built an application that sends its Enterprise Resource Planning (ERP) data to a server at its nearby Winston-Salem campus. If that's not possible, universities can rent space at third-party data centers, Farmer adds.

"Multiple people should have multiple copies, so if there's a biblical-level disaster, it won't take out the data all together," he says.

IT staff should regularly restore data to make sure the data backup and retrieval technology works, DeSouza says. High Point restores its ERP data on a test server once a month. It not only assures the university that the technology works, but it also allows university administrators to use the test server to evaluate new software or try other new things before fully deploying them on the campus network, he says.

Finally, it's important for the IT staff to educate users on SLAs, what they mean and what to expect from the IT staff should disaster strike. For example, High Point offers faculty and students two network drives for data storage, which the university backs up. To provide more storage space, the IT staff is developing a third network drive that won't be backed up, DeSouza says. The IT department will remind users that they should store their most important data in the first two drives.

"When you insert complexity into their lives, you can't just expect them to remember — you must constantly remind them," he says.



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