

The University of Delaware



The University of Delaware Selects Fujitsu ETERNUS4000 Storage Solution for Mission Critical Backup Services

Challenge:

The University of Delaware needed an enterprise-class storage solution for backup and recovery of critical academic and administrative data. The University required a highly reliable, capacity-intensive, and scalable solution that was also cost-effective.

Solution:

The ETERNUS®4000 Model 500 is used for mission-critical backup services and intermediary disk storage for disk-to-disk backup. Currently, the ETERNUS4000 is backing up 250 servers across the entire university. Directly attached to a server that runs EMC Networker, the ETERNUS4000 is used to back up academic research, Oracle databases for PeopleSoft applications, email and Web servers, and the library catalogue.

Benefits:

Fibre Channel (FC) compatibility and FC disk drives increase performance and redundancy as well as provide greater storage capacity at a lower cost. Leveraging the ETERNUS4000, the University can recover lost data much more quickly, and has noticed a significant reduction in the time required to copy to tape. Having capacity scalability has also proven to be a benefit, enabling the University to grow its storage as needs evolve. The excellent support provided by the Fujitsu team has also proven to be a major advantage.

“We needed a storage solution that was built with high-quality hardware but was still cost-effective—the ETERNUS4000 delivered.”

– **Dan Grim, Executive Director of Network and Systems Services at the University of Delaware**



The ETERNUS4000 Model 500 from Fujitsu

The University of Delaware has grown from its founding as a small private academy in 1743 to a major university, offering an impressive collection of educational resources to its more than 19,000 students. With an eye to the future, the University’s central IT group has traditionally embraced new technology—from early Web-based technologies like the Gopher network protocol for student registration to deploying one of North America’s largest university networks. Continuing in this vein, the University offers fast, easy, and reliable data backup services to staff and students who can easily retrieve lost data themselves—and routinely do. At the heart of the University’s backup services is the Fujitsu ETERNUS4000 storage solution, which plays a key role in delivering the assurance that lost data—ranging from academic research to critical administrative data—can be quickly and easily recovered.

A Hidden Gem

As one of the few universities in the United States to use backup services for everyday data retrieval, and not only for major disaster recovery, the University of Delaware needs an enterprise-class storage system that is highly reliable. “Most universities do not have the infrastructure in place to deliver fast and easy data recovery to individual users,” says Dan Grim, executive director of network and systems services at the University of Delaware. In most cases, users have to submit a request to the IT group, which can be time consuming and stressful when critical data has been lost. “We believe that our backup and recovery service is a hidden gem that delivers the peace of mind that our users have come to expect.”

Until recently, the University of Delaware was using an inexpensive storage solution built out of Advanced Technology Attachment (ATA) disk drives that presented many limitations. In particular, the solution did not deliver the redundancy or the storage capacity that the University required. The University chose to replace this solution with the ETERNUS4000 Model 500 because it combines greater capacity, reliability, performance, and scalability in an affordable solution. “We needed a storage solution that was built with high-quality hardware but was still cost-effective—the ETERNUS4000 delivered.”

The ETERNUS4000 Model 500 is used for the University of Delaware’s mission-critical backup services and intermediary disk storage for disk-to-disk backup. Currently, the ETERNUS4000 backs up 250 servers across the entire university—most of which are running Solaris, in addition to Windows, Mac, Linux, and HP-UX. Using the ETERNUS4000, the University is backing up data for research projects in biotechnology, energy conversion,

marine studies, and health sciences to name just a few. In addition, the University backs up Oracle databases that support PeopleSoft applications, email and Web servers, and the library catalogue. The University runs backups around the clock, maintaining one week of data on disk before copying it to tape.

Housed in a standalone cabinet with six shelves, the ETERNUS4000 is directly attached to a single server that runs EMC NetWorker software for backup and recovery. With four shelves full and two virtually empty, the ETERNUS4000 storage system currently provides 32 TB of storage capacity and has room for two more expansion shelves.

“The ETERNUS4000 provides enough storage to hold a significant fraction of our backup on disk instead of on tape—approximately one week’s worth,” says Grim. “This is critical because quick access to the most recent data is what our users want.”

Fibre Channel Compatibility Boosts Reliability and Performance

The ETERNUS4000 uses 4Gbit/s fibre bus switches between controllers and individual disk drives—a key selling feature for the University of Delaware. Fibre Channel architecture is important to the University because it delivers high reliability through duplicated interfaces, which provides two paths into the disk drive and ensures automatic and transparent failover in the event of failure. Serial Advanced Technology Attachment (SATA) architecture, on the other hand, has only a single controller and path into the drive, presenting serious limitations in terms of redundancy. “We made a conscious decision to only buy Fibre Channel compatible storage to ensure virtually non-stop backup and recovery,” explains Grim.

Fibre Channel switches also provide higher I/O transaction performance. “The general idea is that if you have multiple physical paths to the disk system, the Operating System can use all the paths in parallel to deliver higher throughput,” notes Grim. “With its Fibre Channel-based architecture, the ETERNUS4000 delivers the redundancy and performance of high-end systems, but at a much more affordable cost.”

Affordability is another important benefit of Fibre Channel compatibility. According to the University of Delaware, the ETERNUS4000 was the only storage solution on the market offering Nearline Fibre Channel (FC) disk drives, which are dual-channel, full-duplex drives that provide higher capacity at a much lower cost. Because Nearline FC disks use Fibre Channel interfaces, the University can choose to add standard Fibre Channel drives to the ETERNUS4000 for significant cost savings. “Because our storage requirements continue to grow, our top priority was to find a solution that is capacity intensive,” explains Grim. “Incorporating Nearline FC disk drives, the ETERNUS4000 is the only solution that can provide large amounts of storage while providing Fibre Channel compatibility—a top requirement for us.”

High Performance Backup and Recovery

Since deploying the ETERNUS4000, the University has seen a substantial drop in the time required to restore lost data. According to Grim, it can take all night to recover a couple hundred gigabytes of data on tape because you need to mount the tape and position it to the data you need. On the other hand, when the data is stored on disk, it can be recovered almost instantaneously.

For the University of Delaware, however, the major increase in speed is felt when copying data from disk to tape. As Grim explains, if you write to tape too slowly, the tape has to stop, rewind, and start again—a slow and inefficient process that in some cases even damages the tape device itself. With the ETERNUS4000, the University can stage to disk first, enabling them to copy directly from the disk and keep the tape drive running at full speed—dramatically expediting copying speeds. “It takes about two hours to copy data from disk to tape but if you aren’t able to keep the tape moving it can take four to eight times longer,” explains Grim.

The University is also thinking about using the ETERNUS SF One Point Copy (OPC) feature to create clone SnapShots and incrementally updating these SnapShots over time. “Currently, we back up our data over a three-hour period every night and the system is unavailable during that time,” says Grim. “A long term goal is to leverage features like the ETERNUS OPC to make a snap copy of the data in continuous mode and then back it up at our leisure with virtually no impact on system availability.”



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Scalability to Grow

The ETERNUS4000 offers greater scalability than the University's previous backup storage solution, which was limited to a maximum of 48 disk drives. The University of Delaware purchased the ETERNUS4000 with six trays, four of which are full. "By adding two more trays, we can easily double our storage capacity," notes Grim. "On top of that, we can add another cabinet with eight more trays, all running off the same controller, to effectively quadruple disk space to 120 TB." With the ETERNUS4000, the University has a storage solution that can easily meet current as well as future storage demands.

*"With its user-friendly interface and simple configuration, the ETERNUS4000 is very intuitive," says Grim.
"We have not experienced any performance issues."*

Unmatched Support

The University's IT team was pleased with how easy the ETERNUS4000 storage solution was to configure and how simple the system is to manage. "With its user-friendly interface and simple configuration, the ETERNUS4000 is very intuitive," says Grim. "We have not experienced any performance issues."

Most notably, the University of Delaware has been impressed with the exceptional support provided by the Fujitsu team. "We've been amazed with the number and quality of support people Fujitsu has sent out," says Grim. "With most vendors, the product comes in a box and we have to put it together ourselves and hope that it will work. The ETERNUS4000 came with technicians who made sure it worked."

An Eye to the Future

Driven to stay at the forefront of technology innovation, the University of Delaware plans to leverage the advanced features offered by the ETERNUS4000, such as dynamic LUN expansion, RAID consolidation, and proactive disk sparing to further enhance the system's performance and reliability. "We want to be able to configure our storage for maximum performance and detect problems before failure occurs so that we can deliver the most reliable backup services possible," concludes Grim. "Leveraging the unique capabilities of the ETERNUS4000, we can continue to deliver the assurance that critical data can be quickly and easily recovered."