



University of Minnesota

EMC technology supports cost-efficient delivery of enterprise-class storage to university's departments

Founded over 150 years ago as the state's land-grant institution, the University of Minnesota has achieved world-class status for the quality and comprehensiveness of its academic offerings, for its internationally renowned faculty, and for its cutting-edge research. The University spans four campuses, as well as research and outreach centers, throughout the state. The oldest and largest part of the institution, the University of Minnesota, Twin Cities, supports the fourth largest student body in the U.S. with over 50,400 attendees.

The previous storage environment was a collection of disparate servers and direct-attached storage systems managed by individual departments that made resource utilization, scalability, disaster recovery, and information sharing increasingly difficult as storage demands continued to escalate within the University system. A centralized, cost-efficient, and easily managed EMC® tiered storage infrastructure which supports the University's information lifecycle management (ILM) strategy addressed all of these challenges.

"The issues we set out to resolve were related to delivering better business value to the University by improving the ability to leverage, share, and re-provision storage while providing a high level of data protection," says Carl Follstad, manager of University Data Management Services.

By consolidating storage and creating a centralized storage utility, University Data Management Services can now deliver and manage storage capacity and address the different performance and availability requirements of its departments more easily and cost-effectively than they could on their own.

"Storage consolidation and ILM require highly specialized expertise," says Follstad. "That's why we invited EMC Services to help us design and lay out the storage architecture so it was done right the first time. Then EMC Services taught us best practices so we could manage and grow the environment effectively."

Similarly, VMware® virtualization solutions are being deployed within the organization's server environment to bring greater operational and cost efficiencies through consolidation.

Aligning the right storage tier to business need

All of the University's business-critical applications, such as campus-wide e-mail, centralized calendaring, PeopleSoft for financials and student registration, and Oracle databases, are supported by high-performance EMC Symmetrix® networked storage, centrally managed through EMC ControlCenter® software.

"Symmetrix has helped us centralize our storage environment which has led to improved information access, management, and scalability," says Follstad. "We use EMC ControlCenter products such as StorageScope™ and SAN Manager™ to monitor, provision, and report on storage utilization. The control and visibility we now have over our storage arrays and across our storage infrastructure make it easy to know where free storage resides and how much we have available."

"When it comes to tight departmental budgets, the ability to offer different drive options really sells. Our EMC tiered storage infrastructure enables us to reach out and service small departments and offer the benefits of affordable enterprise storage."

Carl Follstad, Manager of University Data Management Services

Departments with important data but less demanding service-level requirements, such as academic health center files and Microsoft SQL Server databases for the Economics department, are entrusted to tier-two EMC CLARiiON® storage systems with high-speed Fibre Channel drives. Infrequently used information, such as library and laboratory images and backup-to-disk data, reside on economical, yet still highly reliable EMC CLARiiON ATA storage at the third tier.

"When it comes to tight departmental budgets, the ability to offer different drive options really sells," says Follstad. "Our EMC tiered storage infrastructure enables us to reach out and service even small departments and offer the benefits of affordable enterprise storage. When we rolled out tier three, it became the most popular option for inexpensive file storage. We haven't had availability issues so people don't think of the different tiers in terms of reliability but rather in terms of performance versus cost."

EMC SAN Copy™ software is used to manually move data between tiers to quickly and easily adjust to growing and changing requirements. Future goals for expanding the University's ILM strategy include automated, policy-based movement of data which is expected to further improve data management efficiency across the storage infrastructure.

Expedient data delivery and disaster recovery over an IP network is yet another option available to the University's departments. It is made possible by two EMC Celerra® NS Series/Gateway systems. One supports the production environment while the other system, housed in a separate location, acts as a replica target for the first system.

"We've got about 25 different departments using our NAS service," says Follstad. "It's a fast setup, it works just like their file servers, and it's usually less expensive because they don't need HBAs and can buy storage in smaller quantities as they require it. They like that they can just call and ask for another 100 gigabytes and it's done."

Data protection across the enterprise

A broad backup and disaster recovery strategy incorporating both local and remote capabilities has replaced the University's traditional tape backup approach. Today, EMC TimeFinder® and SnapView™ along with EMC Symmetrix Remote Data Facility/Synchronous (SRDF®/S) and MirrorView™/Synchronous (MirrorView/S) software ensure data protection across every storage tier. In addition, EMC PowerPath® software, which supports load-balancing and failover functionality, is implemented within the production environment to support optimized throughput and availability. Each production host has at least a dual attachment to the SAN—some have four attachments.

Since its implementation, EMC TimeFinder software has helped to reduce local backup times within the Symmetrix environment. Of even greater advantage is that EMC TimeFinder snapshot functionality has helped take the burden of running backup off the production system by moving it to a separate host that just runs backup. This allows for more predictable performance on the production host and ensures a high level of business continuity.

EMC TimeFinder software also has alleviated a time-consuming and problematic main-frame batch-driven process with FTP that was used to populate an Oracle-based enterprise data warehouse.

“By producing a TimeFinder clone off R2 and just handing that to the data warehouse host we knew we could eliminate the database extract on the source side, eliminate FTP to the remote side, and eliminate reconstitution of the database on the remote side to shave hours off the process,” says Follstad. “This solution also enables us increase the concurrency of the data because we can we can run longer into the night before creating a clone.”

This application of EMC TimeFinder has worked so well that it is being considered for similar use in other database environments.

EMC SnapView, which provides local backup and recovery functionality within the EMC CLARiiON environment, supports backup to ATA drives and online backups.

“We'll do traditional LAN-based backup off of a snapshot with SnapView and take a snapshot every morning,” says Follstad. “We put them on a two-day rotation so we always have two sets of snapshots. If we have a catastrophic failure where we'd normally have to restore from tape, we can just go to the snapshot and get our systems up and running faster.”

EMC SRDF/S technology facilitates realtime remote replication within the EMC Symmetrix environment for unsurpassed disaster recovery. All business-critical applications residing on EMC Symmetrix (with the exception of e-mail which will be included at a later date) are synchronously mirrored between two campus data centers in Minneapolis via EMC SRDF/S software.

“With SRDF and our standby Symmetrix at the remote site we are confident that our data will be protected if a disaster occurs,” says Follstad. “We'll also be able to recover much faster than previously possible—in a few hours versus a few days.”

On the EMC CLARiiON side, EMC MirrorView/S provides for complete disaster recovery coverage through its dynamic remote mirroring capabilities.

“Many of our departments have to answer to auditors just like in the corporate world,” says Follstad. “By offering disaster recovery functionality through MirrorView, they can come to us and instantly get their concerns addressed just by checking a box on a form to synchronously mirror their data.”

Server consolidation through virtualization

Just as University Data Management Services consolidated its storage environment to optimize operational and cost efficiencies, it is also doing the same with its servers using VMware virtualization technology.

VMware software solutions have enabled the University to pull individual machines out of offices and from under desks, replacing them within larger partitioned servers. These larger servers are more easily and economically hooked up to the SAN, which in turn, allows for more centralized and streamlined administration and backup for improved data management and protection.

Other initiatives where VMware solutions are being considered include the University’s smaller schools which will soon be able to benefit from many of the enterprise-class IT advantages leveraged by the larger schools.

“We are proposing to replace their outdated onsite servers with one VMware box that they can access over the LAN,” says Follstad. “It will look and feel just like their previous environment, but they’ll be running on better, more reliable gear and we can manage it for them, which provides both administrative and cost advantages.”

Success paves the way for an expanded community

Unlike a corporate environment where IT decisions are often made for an entire company, in a university environment academic and research committees have exclusive say over IT decisions pertaining to how they run their individual departments. Therefore, a strong appeal for their business must be based on a compelling story and past achievement.

Since the deployment of the EMC tiered storage infrastructure, the University of Minnesota’s University Data Management Services department has grown its storage support network from two campus locations to eight—while successfully managing significant data growth that has been doubling and sometimes quadrupling annually for the past few years.

“We have been able to build a successful business within a community that is traditionally reluctant to release control of their data—partly because we can deliver availability of ‘five nines’ or higher,” says Follstad. “They trust us with their data and we’ve also shown that we can allocate storage to provide the most appropriate service level for each department’s needs, with considerable economies realized through centralized management. Rather than using their budgets and grants to hire storage managers, they can allocate those funds to further support their education initiatives.”



EMC Corporation
Hopkinton
Massachusetts
01748-9103
1-508-435-1000
In North America 1-866-464-7381

EMC², EMC, EMC ControlCenter, Celerra, CLARiiON, SRDF, Symmetrix, TimeFinder, PowerPath and where information lives are registered trademarks and MirrorView, SAN Copy, SAN Manager, SnapView, and StorageScope are trademarks of EMC Corporation. VMware is a registered trademark of VMware, Inc. All other trademarks used herein are the property of their respective owners.

© Copyright 2007 EMC Corporation.
All rights reserved. Published in the USA. 2/07
H2638