



## The Stephen M. Ross School of Business, University of Michigan

### EMC CLARiiON SAN supports growing Exchange environment, school-wide applications, and new research computing cluster

The University of Michigan, which supports the educational aspirations of a student body of over 54,000 students across three campuses, is one of the country's leading public universities and a world-renowned research institution.

The Stephen M. Ross School of Business, like all of the university's 18 schools and colleges, operates fairly independently in that it sets its own direction for everything from academics to IT. In fact, the business school's IT department currently manages over 150 applications used by faculty, students, and staff, and provides a variety of services including help desk, Web development, video training, and classroom support.

Since its deployment five years ago, the performance, availability, and scalability of EMC® CLARiiON® storage have played increasingly important roles in supporting the growing information management needs of the business school.

"We initially bought CLARiiON storage to host our new Exchange environment," says Edward Adams, Chief Technology Officer and Director of Computing Services. "Based on that deployment's success, we started to back-end every service into our EMC SAN and began to realize considerable total cost of ownership benefits. Most of our file and Oracle database servers are now supported by this storage environment and we purchased another CLARiiON to bring a new research computing cluster online."

#### **Fibre Channel drives and a flexible storage infrastructure ideal for Exchange**

Deployed several years ago to support a new, 1,000-seat Microsoft Exchange 5.5 environment for faculty and staff, EMC CLARiiON's lightning-fast Fibre Channel drives were considered a key component to success.

"Exchange is its own unique environment, and we did a lot of upfront analysis with EMC, Microsoft, and Dell engineers to come up with the right design," says Adams. "We felt that CLARiiON's Fibre Channel drives were critical to the project. Based on our success, the central campus is also now running a centralized Exchange environment with a recently purchased EMC CLARiiON-based SAN solution."

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Since its deployment, the application has been upgraded to Exchange 2003, and faculty and staff are expanding use in ways that go beyond just e-mail. For example, an increasing number of users are now storing their PowerPoint presentations, videos, images, and files in Microsoft Outlook as well.

“Our users’ Exchange accounts are where they live every day and they have become an integral part of their jobs,” says Adams. “Because our CLARiiON environment supports manageable LUNs, if we find, for example, that file storage is becoming low because more people are using Exchange as a file store, we can easily address the problem.”

### **A wide adoption of EMC CLARiiON technology**

The successes witnessed in the Exchange environment quickly led to EMC CLARiiON adoption throughout the business school.

“The real test of a solution like this is how well the technology is adopted,” says Adams. “Here’s an environment where the EMC SAN was brought in to run Microsoft Exchange, but once it was here, and once our IT team saw how easy it was to manage, they made the decision to back-end all of the other services to that SAN.”

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Alleviating some long-standing challenges, most of the storage units for approximately 70 file servers handling file storing, printing, video, database, and e-mail for the business school have been replaced by its growing EMC CLARiiON-based SAN environment.

Since each of the servers and their storage had to be managed and backed up separately, administration had become an increasingly time-consuming endeavor. Today Veritas software backs up the centralized EMC CLARiiON storage environment to tape in four to six hours—a considerable time savings over previous backup times which took over a weekend to complete. In addition, EMC CLARiiON’s high-performance disk and Fibre Channel speeds facilitate faster data restore times should a problem occur.

“We’ve got one back-end strategy to tape now,” says Adams. “We do incremental backups every night, a full backup on weekends with those tapes stored offsite, and then we have full monthly and yearly backups.”

To ensure business continuity, the IT department previously had to incur the added expense of keeping the right kind of disks in stock, so that if there was a failure, a replacement disk would immediately be on-hand to plug in. In the old environment, separate, disparate storage systems also meant that unused storage resources could not be easily pooled and flexibly applied to address other requirements.

“We had the typical problem of having lots of excess capacity—just not on the server that we needed,” explains Adams. “Within our EMC SAN environment, we can now dynamically allocate storage resources when and where necessary to easily and cost-efficiently support our users’ requirements.”

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Now, because of EMC CLARiiON's reputation for reliability, coupled with its built-in phone-home functionality, continuous monitoring, diagnosis, and rapid repair make non-stop operations a reality.

"We're a 24x7 business," says Adams. "The class schedule alone is 7 a.m. to 11 p.m. every day. The nature of our program is also such that we don't just get faculty in front of a class of students to lecture. A majority of the learning here is done on project teams which send students all over the world, and so they need access to data around the clock."

As the number of applications supported by EMC CLARiiON storage rises, so do the bottom-line benefits. The ability to consolidate and centralize the storage environment, standardize on one platform for simplified manageability and easy expansion, streamline backup processes and improve business continuity, and flexibly adjust to growing and changing storage requirements are cited as top reasons for a dramatic reduction in the total cost of ownership over the last several years.

### **EMC CLARiiON supports new research computing cluster**

A new EMC CLARiiON CX300 system was implemented last summer to support a new research computing cluster used by over 25 faculty members and 40 PhD students to analyze and trend all types of financial data.

"This environment sees massive data pulls," says Adams. "A user might want to see, for example, a list of all publicly traded corporations that had stock splits over a certain period of time that have to do with the auto industry. This information would then be run through SAS, Mathematica, or Matlab to analyze a trend and do research."

The replacement of 10 high-performance Sun computers (with local disk) running statistical software with four Linux servers clustered against EMC CLARiiON storage now easily distributes the load and helps minimize both utilization conflicts and support challenges.

"It's a huge improvement over what we could previously provide, and we're seeing tremendous growth in research computing because of this deployment," says Adams. "Users can store terabytes of data, which means they can now carry out research in some areas that were not possible in the past."

In addition, performance in research computing has improved dramatically. Before-and-after benchmark testing shows jobs that previously took 24 hours to run can now be accomplished in two to three hours.

Plans to implement EMC SnapView™ to support disk-based backup will also be used within the business school's research environment and other areas to provide faculty with snapshots of their data to retrieve accidentally deleted or lost files.

"Currently, to retrieve a lost piece of research, we have to recall a tape from the offsite storage facility and then mount that tape," explains Adams. "It takes staff effort and time. With SnapView, we will be able to give users that little archive and they can quickly access the information they need. For us, it's not just a backup solution, it also enables us to provide another service to faculty."



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