

OhioHealth

Leading Ohio healthcare network relies on EMC information infrastructure to support information management best practices for quality care



Nationally recognized for its progressive, comprehensive, and compassionate care, not-for-profit OhioHealth has been protecting the health and well-being of an expanding number of communities throughout central Ohio for well over a century. Operating from an extended network that has grown to eight member hospitals, nine affiliated hospitals, eight outpatient centers, and over 30 neighborhood care facilities throughout the region, quality care is never far away.

In a quest to continually advance its mission, “To improve the health of those we serve,” OhioHealth has partnered with EMC to provide the facility with a state-of-the-art information infrastructure based on best practices and industry-leading storage and information management solutions.

“If you’re looking for a ‘five-nines’ system, you don’t have to look any further than EMC,” says Christopher Palagano, Storage Architect, EMC Proven Professional.

Greater performance, capacity, and protection for mission-critical applications data

In continuous operation for nearly a year, OhioHealth’s 35-terabyte EMC[®] Symmetrix[®] DMX-3 series system was deployed to improve scalability to accommodate growing volumes of patient records, and provide improved performance and capacity for tier-1 applications such as McKesson and Oracle and SQL Server databases. Currently it supports approximately 200 Windows 2000, Windows 2003, IBM AIX, and Linux hosts. EMC PowerPath[®] path management software resides on nearly all of the servers connected to the EMC Symmetrix DMX[™]-3 series system and helps facilitate improved performance and applications availability.

“Most, if not all, of our mission-critical systems are on the DMX platform, particularly if they require large amounts of storage,” says Palagano. “Our DMX system scales well and we can add additional disk space on the fly. System performance has also been excellent. Despite the fact that we keep increasing the number of hosts, there have been no bottlenecks.”

EMC Symmetrix Optimizer, an EMC ControlCenter[®] device management application, is used to automatically enhance system performance. In addition, EMC ControlCenter StorageScope[™] and Performance Manager applications are used within this mission-critical storage environment to provide resource management monitoring and reporting capabilities.

“We get reports that let us know what our systems are using as well as alerts that tell us when we’re starting to run out of disk space,” says Palagano. “We have estimated that it takes about three months to go through the process to acquire storage, so these reports help us plan ahead so that we’re not caught unprepared—especially for those applications that consume a lot of storage, like our Fuji PACS.”

At the same time OhioHealth acquired its EMC Symmetrix DMX-3 series system for the main data center, it also deployed a second EMC Symmetrix DMX-3 series system at its disaster recovery site approximately 25 miles away. The systems are connected via a Dense Wavelength Division Multiplexing (DWDM) link.

Symmetrix Remote Data Facility/Synchronous (SRDF®/S) software is used to replicate volumes for OhioHealth's most-critical applications between the two systems. High Availability Cluster Multiprocessing (HACMP) along with EMC SRDF/S and EMC scripts support LUN failover for IBM AIX clusters to the disaster recovery site.

“If you’re looking for a ‘five-nines’ system, you don’t have to look any further than EMC.”

Christopher Palagano, Storage Architect, EMC Proven Professional

Dark servers within OhioHealth's IT environment that don't support clustering are also covered by EMC SRDF/S technology.

“In this situation, we can build a server at the main data center, boot it from the SAN, and then use SRDF to continuously replicate the data and boot drives to the server that is shut off,” explains Palagano. “In case of a site or hardware failure, we failover the LUNs and bring the system up at the other site. We don't have too many of those in place, but it's nice to have that option.”

Symmetrix Remote Data Facility/Cluster Enabler (SRDF/CE) software, which provides tight integration between storage-based remote replication and host-based Microsoft Cluster Server software, is in place to support active/passive failover clusters for Windows.

“The biggest advantage with SRDF/CE is that it enables us to treat our secondary site like a second room in a data center, which means we can put the active node at our main data center and the passive node at our recovery center, and not have to buy any additional hardware to support clustering,” states Palagano.

Currently, IBM Tivoli Storage Manager (TSM) is used as the primary backup application in this environment, but there is interest in using EMC TimeFinder®/Clone in conjunction with EMC Replication Manager, which automates the replication process, to augment backup and recovery capabilities.

“One of our concerns with our current backup solution is the fact that restoration time can be lengthy if we have to go to tape,” explains Palagano. “For example, if we had a 100-gigabyte database it could be close to six hours by the time we called it back from tape and restored it. Alternatively, you're literally talking 30 minutes or less, to replay a clone.”

EMC TimeFinder/Clone capabilities have already proven their worth for OhioHealth's IT team in expediting major migrations of Microsoft clusters that didn't require high availability and were not supported by SRDF/CE.

“We used TimeFinder to quickly move the data from the old servers to the new servers that we built, which greatly minimized our downtime,” says Palagano. “Typically, with that type of migration, where we would have to back up the database, get everything in place, and restore it, we may be looking at three to four hours of downtime, but with TimeFinder we were done in less than 30 minutes apiece.”

Cost-efficiently addressing varying needs at the mid tier

Located within OhioHealth's main data center and remote site are two 21-terabyte EMC CLARiiON® CX3 model 40 storage systems supported by powerful EMC MirrorView™ remote replication software. This redundant, highly reliable, and scalable storage infrastructure provides the ideal platform for

the organization's FUJIFILM Synapse PACS environment. EMC DiskXtender® software also supports this environment, and is used to manage the migration of image archives over 90 days old to a tape library.

"When physicians or radiologists need to view images, they want fast and continuous access," says Palagano. "The high performance and reliability CLARiiON offers made it attractive to us as a disk space solution. The other key selling point is its scalability, which is important given that we are saving about 50 gigabytes of images a day."

EMC CLARiiON CX500 and CLARiiON CX3 model 40 systems, which currently provide both Fibre Channel and ATA storage options to support a disk cache for IBM TSM backup processes, various Windows servers, low-end database systems, and the organization's VMware® environment, will soon be replaced with a new EMC CLARiiON CX3 model 80 system which will help consolidate and simplify this tier-two environment. A second EMC CLARiiON CX3 model 80 system is also being considered for deployment at the organization's recovery site to further strengthen recovery capabilities.

"We see our CLARiiON storage as a mid-tier platform with all the same capabilities and reliability as the Symmetrix, but with a better price point for certain systems, especially for our VMware environment," says Palagano. "The ATA drive option gives us even greater cost advantages for applications that require a lot of storage, but don't need Fibre Channel performance."

Used to monitor and manage EMC CLARiiON storage, EMC Navisphere® software provides a powerful, visual tool that OhioHealth's IT team uses to easily create LUNs and array groups and provision storage.

Also addressing storage requirements at the mid tier is an EMC Celerra® NS series NAS system which supports approximately 7,000 users and accommodates close to 90 percent of the organization's unstructured data from applications such as Microsoft Office and Adobe. Its deployment has enabled a major consolidation of 24 aging and widely dispersed Novell NetWare servers onto a single EMC NAS platform.

"Not only did we reduce our footprint in the data center, but management has also been simplified because we now have only one system to maintain," says Palagano. "Overall system availability has improved as well with this simplified architecture. Another reason why we wanted to go to this NAS system was that we eventually want to enable information lifecycle management, and one of the first phases in doing that was to centralize this storage to one particular platform."

Automated archiving

Housed in the main data center, an EMC Centera® content-addressed storage system, supported by EMC DiskXtender software, is being used as a highly reliable, cost-efficient archive repository for McKesson Horizon Patient Folder Electronic Medical Record. This solution, which supports petabyte scalability, allows for automated, policy-based migration of records over 90 days old from the organization's Symmetrix DMX-3 system.

Information migrated to the EMC Centera system is also replicated across to another EMC Centera system at the disaster recovery site to ensure medical record images are fully protected on multiple levels.

"For legal reasons and for regulations like HIPAA and Joint Commission, we need to save our documents in a way that they can't be modified," says Palagano. "The fact that EMC Centera is designed for permanent records storage, and that we can put large amounts of storage in a single cabinet and easily manage it, makes it a great fit—particularly for our medical records system."

Future use for EMC Centera may include archiving infrequently used files residing on the EMC Celerra NS series NAS system and older Lotus Notes e-mail from the Symmetrix DMX-3 system to facilitate more efficient use of the organization's storage across the various tiers.

“Within our NAS environment, for example, we currently have about five terabytes of storage out there, and we know only about two terabytes of it is being actively accessed,” says Palagano. “That means that essentially 50 percent of our data is just sitting there. We are considering moving that data and storing it on a reliable, cost-effective platform like EMC Centera.”

Taking VMware server virtualization to the next level

In operation for the last four years, OhioHealth’s use of VMware server virtualization technology was, until recently, confined to testing and development. Today, VMware solutions are supporting a rapidly growing segment of the production environment as well.

“Our VMware environment is growing by about 50 percent a year and much of that growth has been related to new requests,” says Palagano. “If someone wants to bring in a new application and it fits the bill for VMware, we will put it on a virtualized server. We’re also planning to use VMware to consolidate a lot of our existing physical servers over to a VMware virtual machine environment.”

Already having a marked effect on OhioHealth’s data center resources, VMware is easing space constraints as well as power and cooling cost despite rising IT demands. In the last year, virtualization has saved the organization an estimated \$1.2 million in server hardware and operating expenses. Greater flexibility to quickly and cost-efficiently accommodate growing and changing needs has also been gained.

“In the past we always had to review and sometimes even turn down requests for a test machine or development project where a physical server was needed for only a short period of time,” says Palagano. “Because our VMware infrastructure is already built, we can now quickly deploy a virtual machine for a new application or a temporary one for testing and development. When they’re done with it, we will just tear it down. It has helped make the support we can provide more dynamic.”

OhioHealth’s VMware environment currently consists of a 14-blade HP server solution supported by the organization’s EMC CLARiiON CX500 and CLARiiON CX3 model 40 systems. Plans to consolidate these units with a new EMC CLARiiON CX3 model 80 system and replicate to another EMC CLARiiON CX3 model 80 system at the organization’s disaster recovery site are expected to support both expansion and state-of-the-art disaster recovery capabilities for this dynamic environment.

“We’re still in the planning stages, but what we would like to do is replicate our most critical applications on VMware from one CLARiiON to another,” says Palagano. “In the event of a DR scenario, we would failover the LUN and bring up the virtual machine on the other side. For less-critical virtual machine applications that don’t need recovery within 24 hours, we’re looking into ways to replicate across the IP network.”

Cutting-edge security solutions

RSA® Security Inc., The Security Division of EMC, helps OhioHealth stay on top of potential security issues with advanced security solutions that include SecurID® and RSA enVision™ (formerly called Network Intelligence enVision).

RSA enVision collects and preserves logs from the organization’s various systems, such as Windows servers, UNIX systems, and firewalls, which can then be mined by OhioHealth’s server administrators and security personnel to track specific events for such objectives as security, compliance, or operational status purposes.

“We can’t keep things forever on the physical systems, so when the logs grow to a certain size we wrap them up and send them to our RSA enVision device,” explains Palagano. “It lets us keep a history of what has been going on with our systems. If someone needs to look into an issue that occurred six months ago, the information is there.”

Relied upon for many years to help ensure secure access, RSA SecurID key fobs are used by OhioHealth to authenticate access into the organization’s network from remote locations over the Internet.

EMC Global Services helps keep operations running smoothly

From implementations and migrations to 24x7 remote monitoring support, EMC Global Services plays a key role in helping OhioHealth maintain optimal operations across all of its EMC storage infrastructure platforms.

“EMC does a good job helping to ensure customer satisfaction,” says Palagano. “EMC solutions give us a high level of confidence that our data is protected and available, and the support people are top-notch. They have a high level of expertise in what they do and have been there for all of our implementations and migrations. They have also been very proactive in addressing phone-home alerts and providing ongoing support.”

As OhioHealth expands, EMC is counted on to keep a finger on the pulse of the organization and help the IT team keep abreast of new storage technology options to address growing and changing information management needs.

“Our EMC sales team has been very committed to helping us solve real problems, rather than just selling us another product,” says Palagano. “We have regular weekly meetings to discuss how things are going and what might be available to help us address different issues or concerns that arise. That’s definitely a valuable service to us.”



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