EMC storage and virtualization technology helps optimize patient care and streamline administration

Six years ago, Nova Scotia’s nine district health authorities (DHAs) individually managed their own IT resources. In 2001, they decided to deploy a powerful new MEDITECH hospital information system supported by a centralized EMC® storage infrastructure that would link hospitals together throughout the province to enable fast, secure access to patient records to ensure better care and streamlined administration.

Since that time, the EMC and MEDITECH environments have grown to encompass more facilities and increasing volumes of online records. EMC storage and virtualization solutions now help cost-efficiently support everything from the government agency’s electronic health record and Agfa PACS initiatives to a more flexible, open IT environment and unparalleled disaster recovery.

“EMC has the breadth of products to accommodate the storage requirements of any organization,” says Gary Stronach, manager, Technical Services for Health Information Technology Services for Nova Scotia (HITS-NS), the province’s service delivery organization. “They don’t just offer a single product manipulated to meet your needs—whatever the data requirement, they have a specific product or solution for it.”

Integrated IT support for 34 hospitals

When the last of its facilities recently came online, the Nova Scotia Department of Health’s HITS-NS data center became the site of one of the more complex MEDITECH implementations in the world. Today, 34 hospitals rely on MEDITECH HIS and a powerful, new 23 terabyte EMC Symmetrix DMX™ SAN which recently replaced an earlier-generation EMC Symmetrix® system within the HITS-NS facility.

Upgraded within the facility’s regular maintenance window, the migration of all MEDITECH data to the new Symmetrix DMX system was completed within a span of five hours with the help of EMC Symmetrix Remote Data Facility/Synchronous (SRDF®/S) software.

“We turned the application off on a Tuesday at midnight and we were up and running by five the next morning,” says Stronach. “For a couple of days we were running in synchronous mode with the new DMX and our older Symmetrix so that when the time came to move over, all we did was break the mirror, release and reallocate the storage to the servers, and then bring the servers online.”
Economical, reliable online storage for PACS archives

As the replacement for almost all of the DHAs’ local tape archives, two 60-terabyte EMC Centera™ content-addressed storage systems now provide reliable, cost efficient online archives for a recently deployed PACS solution from Agfa.

Architected in conjunction with EMC and Sun Microsystems, the Agfa PACS environment is set up to store local caches from DHAs throughout Nova Scotia on Sun hardware where they reside for about a year. At the same time, images from hospitals within eight of the DHAs are committed to EMC Centera archives located at the HITS-NS data center. Images from the local caches of seven hospitals within the more densely populated Capital District Health Authority (CDHA) are also simultaneously sent to an EMC Centera system within that facility. The EMC Centera archives at each data center are then mirrored to one another via Agfa program processes to provide full disaster recovery capabilities. If an EMC Centera system is lost at either site, the other EMC Centera still has a full record of both data center’s archives.

“Chemicals, film, and developer are no longer necessary which saves time, space, and money,” says Stronach. “Online records are also more reliable than tape, and images, whether taken minutes or months ago, are now easily accessible from anywhere in the province. This improves patient care and also reduces costs. X-rays don’t have to be repeated if a patient is transferred to another hospital, for example.”

Minimizing risk with EMC business continuity solutions

To ensure the highest levels of availability at all times, advanced EMC TimeFinder®/Mirror, EMC SRDF, and EMC TimeFinder/SRDF Manager software have recently been deployed to facilitate automated, high-performance remote replication between two EMC Symmetrix systems located within HITS-NS and CDHA data centers, eight kilometers apart. Both synchronous and asynchronous versions of SRDF are used based on differing application requirements for data movement between the two facilities.
“Through our disaster recovery functionality we use TimeFinder BCVs [business continuance volumes] to make a replica and establish that copy at the alternate site through SRDF,” explains Stronach. “We then split the BCV off at the alternate site the next night so we have two copies. If anything goes wrong during the writing of the drive on the alternate site, we’re not vulnerable to losing both the previous and current night’s copy.”

Although the process of verifying final disaster recovery timing is not yet complete, it is expected that restoration of the MEDITECH file structure can be accomplished within three hours.

EMC TimeFinder software is also used to simplify and streamline the movement of files during resizing. For example, when space for an Enterprise Medical Record file, which is a very large collection of time files, became low, EMC TimeFinder was used to create BCVs to mirror the live data so that it could be quickly reallocated to another set of volumes with more space.

Considered the backbone of HITS-NS backup processes, EMC NetWorker™ software facilitates non-disruptive backups at various times of the day and night for all critical information generated by MEDITECH and Nightingale physician office automation applications. All backups are stored within a cost-efficient, highly reliable EMC CLARiiON® Disk Library.

Also a part of HITS-NS’s comprehensive backup and recovery operations is the EMC NS704 NAS gateway. In the early stages of use, the new EMC gateway, which is connected to the EMC Symmetrix DMX, now enables HITS-NS to use its SAN as the storage media for NAS. Presently, this solution is allowing for offsite backup of PACS NFS file shares via EMC NetWorker software as well as the ability to put infrastructure files, such as ghost images of servers, on NAS and then on the SAN so that they can be mirrored via EMC SRDF to the CDHA location.

“NAS was put in on our latest refresh because we wanted to have network storage as opposed to local storage on all of the servers to gain key benefits such as lower cost, redundancy, higher availability, and mobility,” says Stronach. “Data can be moved more easily when it’s on the network and you’re not as susceptible to losing an entire service because you lose a server.”

Tapping into the power of virtualization technology

Over the last five months, with the help of VMware® virtualization technology, HITS-NS has replaced 20 single-purpose servers with one bank of 10 blade servers. VMware ESX Server™ and VMotion™ solutions also have helped to dramatically improve the flexibility of the infrastructure to easily and cost-efficiently address new and existing application requirements while improving availability, even during maintenance.

“During maintenance, we can quickly move applications and data off of the ESX Server and run them on another server while we take the ESX Server offline to apply software or OS patches or even deploy hardware,” says Stronach. “We can then test, verify, and restart the VM sessions, and move the applications and data back to that server—all without impacting availability.”

As the number of physical servers has dwindled, day-to-day management has also become easier and less time consuming. Specifically, the number of internal storage backups required has been reduced, and because there are fewer physical machines there are fewer faults as well.
“We have a small technical staff at the data center and we don’t want them spending all their time trying to find, fix, and move applications every time something goes wrong with an older piece of hardware,” says Stronach. “With blade infrastructure you can have a fault, but it’s easier to address and the service doesn’t go away because it’s all virtual. VMware technology has helped us simplify and improve our operating environment and we plan to aggressively deploy it wherever it makes sense.”

**Responsive, knowledgeable support**

The proactive support that goes along with EMC’s industry-leading solutions is one of the key reasons why the Nova Scotia Department of Health initially selected and continues to work with EMC.

“We are in a very intense environment and the speed and accessibility of data is critical to our ability to meet the stringent SLAs we have with the hospitals we support,” says Stronach. “EMC has provided the resources and responsiveness to help us resolve our information management challenges. A lot of people don’t realize that we built a data center in a couple of months, and now deliver a brand new service to 34 hospitals. We couldn’t have done it without the support of EMC’s technical and project management team.”