

IBM Digital Imaging Storage Technology Lays Foundation for Enterprise-wide Integrated Health Network

Cardiology PACS is First Step for Florida-based Health First to Deliver Better Community Patient Care

Application

Champion Solutions Group provided Health First with a robust, scalable and reliable three-tiered storage, software and disaster recovery solution featuring the IBM TotalStorage Enterprise Storage Server (ESS) Model 800 and IBM Tivoli Storage Manager.

Business Benefits

Champion's solution has enabled Health First to leverage their existing infrastructure, contribute to better patient care for their community, and position themselves as a forward-thinking, 21st century healthcare provider. Health First has also been able to improve service to their cardiology team and Heart Institute, as well as efficiently route, store, and deliver studies to diagnostic review stations for physicians on demand.

Hardware

- IBM TotalStorage Enterprise Storage Server (ESS) Model 800
- IBM TotalStorage FAST Storage Servers
- IBM TotalStorage NAS Gateway 300's
- IBM TotalStorage Ultra-scalable Tape Library 3584

Software

- IBM Tivoli Storage Manager (ITSM)

Background

According to Frost and Sullivan, "The number of cardiology imaging facilities in the United States is growing significantly each year. However, the number of cardiac procedures is growing even faster. The management of physical, CD, video, and film libraries involves a great deal of manual work, and is a major cost center for cardiology departments. As a result, cardiology-imaging administrators are searching for efficient ways to handle the steadily increasing workload."

The cardiology image Picture Archiving and Communications Systems (PACS) is one of the ways in which end users are responding to the drive for greater efficiency.

On a larger scale, Frost and Sullivan note there is also a growing trend toward "integrating enterprise-wide systems that tie together data and images from multiple modalities and departments; where information from cath labs, echocardiography, computed tomography, MRI, nuclear medicine, hospital information systems, clinical information systems, and many other databases can be accessed seamlessly from a single point of interaction."

Business Challenge

Health First of Rockledge, Fla., has always been dedicated to bringing the best technology to patients within its community. An integrated health services organization, the Health First enterprise spans three Brevard County hospitals, and provides services to more than 40 additional sites, including outpatient clinics, diagnostic centers, and a state-of-the-art Heart Institute.

For Health First, Cardiology PACS was a first step to better assist patients with their health care. With the hospital investing in new high-resolution Cardiology Cath Lab equipment, it now required the backend support for processing, managing, and storing digital images (some as much as one gigabyte in size) emerging from these modalities.

This demanded a Cardiology PACS system that was up to the task of utilizing the full diagnostic capability of this equipment. The system would manage the high-resolution digital images and help cardiologists be more productive by allowing them easier and faster access to patient studies.

Integrated Health Network

This technology investment would also provide a gateway to a much more ambitious goal: one enterprise-wide archive for patient information from all imaging modalities.

Steve Shim, director of Technical Services, Health Information Technology Department explained: "Our challenge was to build out a digital imaging system that supported not only cardiology, but laid the foundation for an integrated health network across the enterprise. Health First is a very strong, IT-centric organization. Our goal was to leverage the technology infrastructure we have in place to build this foundation. We wanted to utilize open standards for communication and storage, which were flexible and could scale up in the future. For quite some time we have relied strongly on IBM solutions to provide backend storage and server technology. It didn't make sense to implement, train our people on, and manage an entirely different system just for digital imaging."

Solution

Health First determined a requirement for tiered storage that was very fast and reliable and could scale well to meet needs as the size of the organization changed. Health First reviewed a number of procurement responses from industry resources based on these standards. Heartlab's Encompass™ cardiology image and information management system was chosen as the core application for cardiology, and IBM Premier Business Partner Champion Solutions Group was selected to guide the infrastructure build out.



“Champion has been a long-term partner of Health First because of its expertise in storage technology. Champion did an excellent job of helping us define what we needed the Heartlab application to do. We then started working with them and the technology to ensure there were no single points of failure, and to maintain a level of performance that was appropriate for an enterprise-grade, integrated health network.”

- Steve Shim, Director of Technical Services – Health Information Technology Department, Health First

Heartlab VP of Technical Operations, Matthew Aitkenhead, said: “Encompass is a software-based solution that supports a variety of data archiving platforms. For customers like Health First, Encompass provides the sophisticated clinical information management capabilities required by their cardiology departments while at the same time offering the flexibility demanded by the IT department to implement an efficient enterprise-wide data archive.”

Shim added: “Champion has been a long-term partner of Health First because of its expertise in storage technology. Champion did an excellent job of helping us define what we needed the Heartlab application to do. We then started working with them and the technology to ensure there were no single points of failure, and to maintain a level of performance that was appropriate for an enterprise-grade, integrated health network.”

Three-Tiered Storage

Statistically, cardiology images taken in a cath lab are most often reviewed within a several month window of time after the original study is completed. From that period on, studies become less frequently used, with a reduced priority for real-time review.

Champion presented a three-tiered, storage solution wrapped around a SAN to meet this criteria. In order to ensure reliability and accessibility, Champion recommended an IBM TotalStorage Enterprise Storage Serve® (ESS) 800 to maintain the studies for those first three critical months, when patients and physicians are most likely to need rapid access.

After the initial time frame, Health First felt comfortable moving to a lower-tier storage solution that wasn't quite as fast. For the second tier, Champion recommended IBM TotalStorage FAST Storage Servers, along with IBM TotalStorage NAS Gateway 300s that would take studies out to a one-year time frame. This still

allows physicians and technicians access to the studies in a timely manner, but doesn't burden the primary ESS storage. This second tier provides approximately 10 terabytes of storage.

After a year, the studies are moved to a “cold storage” product. The key was to still utilize spinning disks by design, to have the studies available on demand in an efficient manner. The third-tier solution was a DVD jukebox from Heartlab, delivering deep archives with reasonably fast recovery. Lastly, Health First utilizes an IBM TotalStorage Ultra-scalable Tape Library 3584 with Tivoli Storage Manager to back up all this data. For fiber connectivity, Health First employed McDATA Enterprise-to-Edge SAN solutions.

Disaster Recovery

“We are constantly taking more and more systems into a digital and electronic environment, so continually need to find ways to scale up our disaster recovery solutions to meet the needs of these systems as they go online. Just consider...as part of this Cardiology PACS build out alone, our digital imaging storage requirements doubled in one year,” said Shim.

To assist, Champion also leveraged Health First requirements to implement an ongoing disaster recovery plan within their organization's structure to support the ESS. Part of the disaster recovery plan is laying out the infrastructure to recover systems in hours and replicate data on a real-time or near-real-time basis throughout the organization. Initial efforts involve the installation of a new ESS off-site to support the existing data center and replicate data between the two sites.

Results

With a very small increase in manpower, Health First has been able to leverage its existing infrastructure and contribute to better patient care for our community, and position itself as a forward-thinking, 21st century healthcare provider.

“Service to our cardiology team and Heart Institute has been substantially enhanced,” said Shim. “There is no comparison to what we had before. Now we can efficiently route studies extremely rapidly, store them, put them back online, and deliver them to diagnostic review stations for physicians on demand.”

“With the success we have had, we are already making plans to take the same structure and build out digital imaging into additional areas,” he said.

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