HP tiered storage speeds access to medical records

Children's Hospital San Diego cures archive lethargy with cost-effective FATA drives

"With the HP solution, we cut access times for older records from up to three minutes to nearly instantaneous. Our users were amazed. With an HP tiered-storage solution and HP Critical Service, I can go to sleep and not worry about getting calls in the middle of the night about storage-related issues."

– Sheldon Hinkson, Operations Manager,
Children's Hospital and Health Center of San Diego

Business need:
Hospitals and other healthcare providers are under extreme pressure to provide the highest quality patient care, yet control costs in every aspect of the care continuum. When a leading Southern California children's hospital tried to move to a paper-free medical records and charting system, a sluggish archiving system impaired the success of the project. The hospital needed a storage architecture that could deliver high capacity, nearline storage of patient records, insurance information, billing history, and other vital data.

Solution overview:
After careful evaluation of competing storage systems – including those from HP, Hitachi, and Dell/EMC – the Children's Hospital and Health Center of San Diego chose the HP StorageWorks 5000 Enterprise Virtual Array tiered storage solution as the heart of its electronic patient records system. The new storage architecture is enabling the hospital to provide rapid access to important information using high-capacity, cost-effective Fibre Attached Technology Adapted (FATA) drives.

Healthy record of success
Founded in 1954, Children's Hospital and Health Center of San Diego delivers specialized healthcare services for children through state-of-the-art technology – combined with a climate of caring. Children's is the San Diego area's only designated pediatric trauma center and the only area hospital dedicated solely to pediatric care.

For the past several years, Children's has worked hard to reduce its reliance on paper-based medical records and to provide faster, more efficient information access – both in direct patient care and in back-office operations. In 2003, the hospital introduced the ChartMaxx electronic patient records system to help accelerate access to patient records and decrease the burden on physicians and other caregivers.

The ChartMaxx system runs on an HP 9000 rp7400 server under the HP-UX11i operating system. The system stores new or recently used medical records on local hard disk and offloads older records to alternative storage. When first implemented, the hospital chose an optical jukebox for archival storage. However, this system soon proved too slow to keep up with higher-than-expected archive retrieval demands.

"Overall, the original implementation of the ChartMaxx system was a tremendous improvement over the old paper-based records management system," recalls Children's Operations Manager Sheldon Hinkson. "However, archived patient information was still taking up to three minutes to come up from the optical jukebox. This was a continuing source of frustration. Any delay in accessing patient information is a target for improvement."

Balanced evaluation leads to healthy choice

The original ChartMaxx implementation was built on a traditional array-based storage area network (SAN). Managing this storage infrastructure was technically challenging and the hospital relied heavily on storage specialists from Nth Generation Computing for configuration tuning and advice. To reduce patient-record access times and enable the hospital's IT staff to manage its storage resources more efficiently and effectively, the hospital began evaluating storage alternatives in the summer of 2004.

Over a two-month period, Hinkson and other hospital evaluators looked at storage solutions from HP, Hitachi, and Dell/EMC. The goal was to find a storage system that could provide cost-effective capacity allowing online access to current as well as archived patient records and other information. The new system would replace the existing SAN and optical jukebox.

The decision came down to a choice between the HP StorageWorks EVA5000 tiered storage solution – equipped with both high-performance disk and FATA low-cost disk – and the Dell/EMC CX300 and CX500 storage systems. Hinkson explains, "The EMC systems had many bells and whistles, but compared to the HP StorageWorks EVA, the EMC product seemed much more difficult to manage. The EVA essentially offered us point-and-click simplicity in management. We were also an HP shop and the EVA was just a better fit for us. The StorageWorks EVA allows us to do more with the same IT staff."

In November 2004, Children's implemented its new HP StorageWorks EVA5000, equipped with nearly 12 TB of storage – including 1.7 TB of high-performance disk and 10 TB of high-capacity, low-cost FATA drives. The new SAN supports approximately 140 ChartMaxx users, many of whom access the system over the hospital network from more than 100 wireless tablet computers. The ChartMaxx system stores the most recent patient records on the SAN's high-performance disk. As this high-speed storage reaches capacity, Children's moves the oldest or least-accessed records to the FATA disk.

"With the HP solution, we cut access times for older records from up to three minutes to nearly instantaneous," Hinkson emphasizes. "Our users were amazed. Everyone could now see why we invested in the ChartMaxx system and a tiered storage solution. Now, there is no one knocking on my door about poor response time. With HP Enterprise Virtual Array and HP Critical Service, I can go to sleep and not worry about getting calls in the middle of the night about storage-related issues."

According to Rick Melendres, senior account manager for Nth Generation, the EVA5000 – equipped with a combination of high-performance disk and low-cost, large-capacity FATA drives – offers investment protection and reduced downtime. "By supporting both high-performance disk and FATA drives in the same frame, the HP StorageWorks EVA5000 allows users to use computer room space efficiently by providing online and nearline storage in the same system," Melendres explains. "The system is designed so that Children's can expand storage capacity for both functions anytime they need it, without experiencing downtime."

Storage wellness results in continued rollout

The performance improvement the EVA5000 tiered storage solution provides enabled Children's to proceed in rolling out the ChartMaxx system to additional locations. "The remote sites would not have worked using the optical platter system," Hinkson says. "If it was slow within the hospital's headquarters network, it would have crawled across the WAN to our remote sites."

Hinkson also notes that the higher performance EVA5000 also reduced backup times by more than 30 percent. Children's has HP StorageWorks Business Copy EVA and plans to use that replication software to take point-in-time snapshots of live production data and use it for testing purposes.

> "As we migrate and standardize on HP virtualized SAN solutions, we gain greater and greater control over our storage resources. We find the HP StorageWorks Enterprise Virtual Arrays easier to manage, more reliable, and more cost-effective than any storage system we've ever used."
>
> – Sheldon Hinkson, Operations Manager,
> Children's Hospital and Health Center of San Diego

The tiered storage the HP StorageWorks EVA5000 delivers has been so successful at Children's that the hospital plans to implement a similar system in the summer of 2005 as part of a new Picture Archival and Communications Systems (PACS). Plans call for this second EVA5000 to be equipped with 15 TB of tiered storage consisting of approximately 75 percent FATA disks, for a cost-effective mix of high-performance and high-capacity, low-cost storage.

The plan is for the PACS to be dedicated to managing and distributing radiology images across the hospital network. Children's expects the system to help reduce the reliance on film, reduce manual records handling, and provide faster image access, particularly for remote locations and operating rooms. To enhance its use of the HP tiered storage solutions, Children's also plans to conduct a Business Impact Analysis (BIA) in summer 2005. The BIA will guide Children's in designating how to prioritize data for critical online high-performance storage and less-critical nearline storage.

In 2006, the hospital plans to phase out the HP StorageWorks Enterprise Modular Array 12000 (EMA12000) SAN supporting Microsoft® applications, and replace it with an HP StorageWorks 3000 Enterprise Virtual Array. According to Hinkson, that SAN will help the hospital begin to consolidate storage islands dedicated to Microsoft Windows®-based applications.

Children's IT environment also includes a second HP StorageWorks EMA12000 SAN dedicated to the hospital's MEDITECH Health Care Information System (HCIS), which runs on HP ProLiant DL380 servers. The MEDITECH HCIS suite provides a complete range of integrated hospital-management applications. The ChartMaxx system links to MEDITECH for the coordination of billing and insurance information for services rendered.

"The tiered storage our HP StorageWorks EVA5000 delivers is the first step in our progression toward a comprehensive Information Lifecycle Management (ILM) environment," Hinkson concludes. "As we migrate and standardize on HP virtualized SAN solutions, we gain greater and greater control over our storage resources. We find the StorageWorks EVA system easier to manage, more reliable, and more cost-effective than any storage system we've ever used."

About Children's Hospital of San Diego

In addition to its Kearny Mesa main campus, Children's Hospital and Health Center of San Diego (www.chsd.org) operates 15 neighborhood centers offering primary care and specialized services. With 2,100 employees, Children's is also active in numerous community outreach programs, including health education, early intervention and counseling, child abuse prevention and child safety issues.

HP tiered storage speeds access to medical records
Children's Hospital San Diego cures archive lethargy with cost-effective FATA drives

At a glance

Hardware:
- 2 HP StorageWorks 5000 Enterprise Virtual Array (EVA5000) with tiered FATA-based storage architecture
- 2 HP StorageWorks Enterprise Modular Array 12000 (EMA12000)
- 140 HP servers, including:
  - HP ProLiant DL360, DL380, DL560, 5500, and 1850 servers
  - HP 9000 rp7400 and rp2400 series servers
- 2 HP StorageWorks Ultrium tape drives
- HP StorageWorks ESL9198 enterprise tape library

Software:
- HP-UX11i operating system
- HP StorageWorks Business Copy for EVA
- HP StorageWorks Command View EVA
- HP StorageWorks Secure Path
- MEDITECH Health Care Information System (HCIS)
- ChartMaxx electronic patient record system
- Microsoft Exchange Server 2003
- Microsoft SQL Server 2000
- Microsoft Windows Server 2003

Services:
- HP Critical Service for SANs
- Nth Generation: storage configuration and support

Challenges

- Increase performance and acceptance of paperless patient records and charting system

- Enable hospital IT staff to self-manage its storage resources for efficient operations

- Reduce training time by standardizing SAN storage

- Improve monitoring of storage performance

- Enhance use of data center resources, including space and staff knowledge

Solution

- Replaced array storage and optical jukebox with HP StorageWorks EVA5000 tiered virtualized storage

- Will implement second StorageWorks EVA5000 to support Windows-based applications

- Engaged HP Critical Service for EVA5000 supporting ChartMaxx solution

- Teamed with HP, and HP service provider Nth Generation, for successful implementation

Results

- Gained single-point control of storage resources

- Achieved cost-effective, tiered storage management for critical electronic patient records

- Reduced backup time by 30 percent

- Improved access time for archived patient records from three minutes to nearly instantaneous response

- Accommodates dynamic change and unpredictable IT demands

For more information on how working with HP can benefit you, contact your local HP representative, or visit us at www.hp.com.

hp invent