

British Columbia Cancer Agency improves patient care with distributed storage grid



"The HP-Bycast solution provides a solid foundation for the treatment of cancer in BC. Grids across the province are designed to enable cancer care providers to view the images as conveniently and securely as possible. It is a huge success."

– Don Henkelman, Chief Information Officer,
Provincial Health Services Authority

Business need:

As diagnostic tools evolve, the file sizes for medical images are growing in tandem. With 30 hospitals and medical centers generating images and sending them to the BC Cancer Agency, the institution needed a better way to store, back up, and protect an immense volume of cancer-related images – and make them instantly available to authorized doctors and clinicians at multiple healthcare facilities.

Solution overview:

BC Cancer Agency deployed HP StorageWorks Modular Smart Array systems, HP ProLiant servers, and Bycast StorageGRID MultiSite™ software across five facilities to form a distributed storage grid. Working with HP and Bycast, BCCA's IT pros linked the storage infrastructure with the agency's Electronic Medical Records system. This enabled authorized users to acquire studies from internal modalities, Picture Archiving and Communication Systems (PACS), and 53 external hospitals. More than 1,000 clinicians use the system.



BC Cancer Agency
CARE & RESEARCH

An agency of the Provincial Health Services Authority

Diagnosing storage problems

Years ago, healthcare providers distributed medical images on film. As digital technology became popular, digitized images (typically stored on CDs) replaced film. Gradually, diagnostic imaging equipment improved, making the images more difficult to store, transmit, and archive, mainly due to their size. These physical constraints – coupled with more stringent regulations governing who can access healthcare information – motivate today's healthcare providers to devise more advanced systems for storing, backing up, and retrieving diagnostic images.

Consider the British Columbia Cancer Agency (BCCA) in Canada, an agency of the Provincial Health Services Authority. Leveraging HP StorageWorks storage arrays and Bycast StorageGRID software technology, BCCA created an enterprise-wide medical image archive to provide healthcare professionals throughout the province with instant access to current and historical diagnostic images. The results enhance patient care, reduce costs, increase IT efficiency, and facilitate compliance with industry regulations.

"We have a huge need to effectively manage images across the scope of cancer care," says Provincial Health Services Authority's Chief Information Officer, Don Henkelman. "However, with our previous method of storing images on CDs, we couldn't handle the volume of images. We needed a better way to distribute, store, and retrieve this type of information – and to do all of this with improved security."





Treating IT disorders

With B.C. hospitals and medical centers creating more than 20,000 cancer-related studies each year, the agency's CD archive filled many rooms. IT staff found it increasingly difficult to keep these CDs organized and to make the medical images available only to authorized users.

To address these issues and create a more scalable and efficient image-storage system, BCCA selected HP Modular Smart Array (MSA30) systems in conjunction with Bycast StorageGRID MultiSite™ software. The Bycast StorageGRID software – running on HP ProLiant DL360 servers – provides a unified, multi-site archive for storing and distributing diagnostic images throughout BCCA's geographically dispersed treatment centers.

"We needed to be able to access images quickly from distant geographic locations," Henkelman recalls. "The HP-Bycast solution could do the job reliably on a large scale."

Bycast StorageGRID, a high performance, grid-based, fixed-content storage solution, delivers fast access to information while lowering storage costs and simplifying storage management. It is based on the patented Bycast StorageGRID Architecture, where a grid is a network of computing resources – including storage, processing power, and networking – presented as one large virtual computing system. The StorageGRID enables users and applications to transparently access heterogeneous, geographically distributed resources.

Cure for storage ailments

Using HP StorageWorks arrays and HP ProLiant servers, BCCA implemented six Bycast StorageNODE systems in three locations, connected via a wide area network. HP Services and Bycast Professional Services helped implement the new storage architecture and integrated it with BC Cancer Agency's Electronic Patient Records (EPR) system.

"The deployment was an absolute piece of cake," comments BC Cancer Agency's IT Project Manager, Midori Kawahara. "We went from technology selection to production in a matter of months. With this infrastructure you don't have to set up a storage area network, so you can implement this type of grid with comparatively inexpensive disk arrays."

BC Cancer Agency favors HP ProLiant servers and disk arrays for their reliability, manageability, and low cost. According to Kawahara, the hot-pluggable capabilities of the HP StorageWorks Modular Smart Array enable operators to quickly pull out a failed drive and replace it with a new one. The system then rebuilds itself on the new drive. "We cannot afford for this system to be down," Kawahara notes. "The HP-Bycast system is redundant, so we never worry about losing data. Furthermore, our operators can perform upgrades on a node-by-node basis, so BC Cancer doesn't have to bring down the whole grid for maintenance and upgrades. We can add additional capacity to the system on the fly."

Prescription for better patient care

Today, BC Cancer Agency's distributed storage grid provides a unified, fault tolerant archive for all types of imaging studies – including computed tomography (CT), magnetic resonance (MRI), computed radiography (CR), nuclear medicine (NM) and ultrasound (US). Clinicians can acquire images from departmental PACS or directly from multiple modalities. Each diagnostic image is stored in three locations to provide an extra level of resiliency. Currently, the grid has 14 TB of capacity.

"Increasing the quality of patient care is our priority. The HP-Bycast solution allowed us to dependably distribute, store, and retrieve diagnostic images throughout the province. We achieved substantial cost savings using HP StorageWorks and Bycast StorageGRID products."

– Don Henkelman, Chief Information Officer,
Provincial Health Services Authority

"The StorageGRID system is designed to encrypt images stored on the grid so only authorized users can access them," Henkelman explains. "The physicians love it because they don't have to deal with multiple viewers like they did before. All of the images are instantly viewable at their desktops."

Since the Bycast software maintains three copies of each image in different locations on the grid, they have eliminated the need for tape backup and restore procedures. Because the Bycast system stores images in a RAID 5 configuration, the grid can automatically serve up a replica if there is a data error. The new storage system is faster, more scalable, more secure, and more reliable. It also supplies a foundation for growth, since it could be used as the primary architecture for storing other types of medical records in the future.

"The HP-Bycast system delivers exactly what we need," Henkelman concludes. "We now have a cost-effective medical image archive that is accessible across multiple sites. We have increased our access speeds two to three fold, according to my tests, and we have enhanced patient care, since physicians can access images quickly, regardless of their locations. The deployment is a complete success."

About the British Columbia Cancer Agency

The BC Cancer Agency (www.bccancer.bc.ca) provides a cancer-care program for the people of British Columbia, including prevention, screening and early detection, diagnosis and treatment services, support programs, community programs, research, and education. The BCCA operates four major regional cancer centers in Vancouver, Surrey, Victoria, and Kelowna. A world leader in cancer care, the BCCA functions within the Provincial Health Services Authority, Canada's first provincial health services authority.



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Challenges

- Quickly distribute medical imaging studies throughout multiple locations
- Improve security for storing all current and historical imaging studies Adhere to regulatory requirements governing confidentiality and disaster recovery
- Enable seamless retrieval through the existing EPR interface
- Make medical images accessible from all diagnostic and clinical workstations throughout all facilities

Solution

Hardware

- HP ProLiant DL360 servers – enterprise-class 1U servers with up to dual 3.6 GHz Intel Xeon processors)
- HP Modular Smart Array 30 (MSA30) – an Ultra320 SCSI storage system supporting up to 4 TB in 3U

Software

- Bycast StorageGRID MultiSite™
- Bycast SPEEDStorage™
- Bycast SMARTStorage™

Services

- Bycast Professional Services
- HP network storage services and server services

Results

- Enhances patient care with enterprise-wide access to images, regardless of location
- Increases access speed 2.5 times
- Completes the electronic patient record through the addition of imaging studies
- Increases security and patient record confidentiality
- Facilitates compliance with industry regulations
- Reduces system downtime

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