Central Queensland University ranks HP storage solutions at the head of the class

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Central Queensland UNIVERSITY

"The HP StorageWorks Enterprise Virtual Array defines the future of adaptive storage and gives us an IT environment flexible enough to meet our diverse faculty and student needs."

– Adrian Yarrow, UNIX Systems Manager, Central Queensland University

Business need:
Australia's Central Queensland University (CQU) takes prides in its diverse and far-flung learning environment. Yet, the same qualities that make it such a powerful educational force also place tremendous strain on the school's IT resources. CQU sought a solution that would provide improved 24x7 availability of resources, streamline IT technologies and processes, and improve visibility and usability for the campus. This would free its staff to focus on developing new services and applications, and enable the university to deliver educational services to a widespread campus network.

Solution overview:
CQU relies on HP technology and services to consolidate and virtualize storage, help streamline archiving and backups, and provide a single view of campus-wide storage and server resources. To improve utilization, provide heterogeneous support, increase staff efficiency, and help meet 24x7 uptime needs, CQU uses an HP StorageWorks Enterprise Virtual Array (EVA), Reference Information Storage System (RISS), Virtual Library System (VLS), and HP OpenView Storage Operations Manager. The result: streamlined payroll processing, 24x7 availability for students and faculty, improved business continuity and availability, and effective student administration support.

**University takes HP virtual SAN to school**
Students at Central Queensland University (CQU) enjoy a world-class education – along with the usual assortment of college parties, sports, and fraternal activities. Many are also drawn to northeastern Australia's unique natural attractions, such as "walkabouts" of the area's 100 national parks, "fossicking" for precious metals and gems, or snorkeling along the Great Barrier Reef. Located on the Tropic of Capricorn, CQU offers high-quality undergraduate and graduate education against a gorgeous tropical backdrop.

In just 32 years, CQU grew from a single campus in Rockhampton to a multi-campus, national, and international university serving more than 24,000 students. One of the keys to maintaining its position as Australia's fastest-growing university is CQU's use of advanced information technology (IT) to deliver outstanding educational services to a globally diverse campus network.

CQU relies on HP StorageWorks storage area network (SAN) technology, HP AlphaServer systems, HP ProLiant servers, and HP mission-critical support to provide 24x7 educational and administrative IT services for its nine Australian campuses; joint-venture facilities in Fiji, Singapore, and Hong Kong; and more than 8,000 distance-learning students around the world. HP StorageWorks SANs, including the HP StorageWorks Enterprise Virtual Array (EVA) and clustered AlphaServer systems, enable CQU to:

- Create a virtualized storage and server environment where resources are pooled and managed from a common interface
- Implement and leverage information lifecycle management (ILM) to improve SAN performance, ease archive accessibility, and improve backups and business continuity readiness

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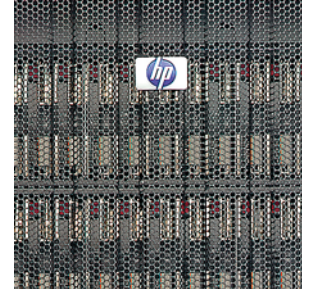
- Improve staff efficiency through server consolidation
- Reduce processing time for some critical applications by more than 80 percent
- Deliver 24x7 uptime for students, parents, faculty, and staff
- Ease access to educational video and other important resources

Multivendor support aces diverse environment

Many CQU departments maintain their own small IT operations to support academic research, while the school's Information Technology Division (ITD) manages mission-critical educational and administrative applications. Most of the 70 servers in the ITD Rockhampton data center are ProLiant servers and AlphaServer systems. The school also maintains several Sun Solaris servers for educational purposes, which is a key reason why ITD management chose an HP storage infrastructure.

"HP StorageWorks SAN technology supports a multivendor environment, which fits our purposes nicely," notes ITD's UNIX Systems Manager Adrian Yarrow. "Not only can we accommodate disparate servers within ITD, we can also integrate those from previously independent departmental IT operations. This flexibility improves the level of service we can provide to both faculty and students."

According to Yarrow, CQU installed its first HP StorageWorks SAN more than six years ago to support its implementation of the PeopleSoft Student Administration solution. CQU uses the PeopleSoft system to manage all aspects of a student's relationship with the university – from recruitment and enrollment to managing records and grades.

"The HP StorageWorks solution was our first taste of SAN technology. We were pleased with its storage capacity,

performance, and support for PeopleSoft applications," Yarrow says. "Immediately, we saw how we could use HP SANs to gain additional efficiency and keep our student administration functions running smoothly."

SANs write the latest chapter on server consolidation

In recent years, CQU implemented additional HP StorageWorks SAN solutions to support a major server-consolidation program and streamline overall systems management in order to ease staffing challenges. The IT staff streamlined its server platform by teaming a StorageWorks SAN with a pair of clustered, four-processor AlphaServer ES40 systems running the HP Tru64 UNIX operating system and HP TruCluster Server software. Twenty-eight AlphaServer and ProLiant systems link to the SAN.

"We face continuing growth in IT service demands, yet we are limited in the number of staff we can hire," explains Yarrow. "We had to take a hard look at our server and storage management. By moving to the HP StorageWorks SAN and clustered HP AlphaServers systems, we reduced the sheer number of servers we had to manage. This also helped us protect our investment in disk storage by consolidating numerous direct-attached disks (DAS) from individual servers to the HP StorageWorks SAN fabric."

In 2002, ITD implemented a new video-streaming solution to support distance-learning students and academic programs at its many sites. The video solution required multiple terabytes of high-performance storage, and the HP StorageWorks Enterprise Virtual Array (EVA) system was a natural choice to meet the challenge. CQU employed HP SAN implementation services to install the system quickly and seamlessly. Since then, CQU has also implemented two new HP StorageWorks EVA solutions, models EVA3000 and EVA8000.

Virtualization makes storage management as easy as ABC

"Once I fully understood the capabilities of the HP StorageWorks EVA system's virtualization technology, I was very impressed and realized how much it would help us," Yarrow notes. "One of the most exciting things about HP virtual storage control is that it eliminates the worry of managing physical disk resources and lets us focus on providing storage services for applications and users. I also like the intelligent-monitoring features, which warn us in advance of a potential issue."

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The focal point for EVA control is HP OpenView Storage Operations Manager software, which provides a centralized point for managing and monitoring any number of EVA systems and all other SAN elements. Based on the HP Integrated Storage Resource Management strategy, this solution emphasizes adaptive automated policies and tools to reduce storage-management complexity.

"HP OpenView Storage Operations Manager is a great toolset for us," Yarrow explains. "We love the fact that it's entirely web-based and gives us a single-pane-of-glass view of our complete storage infrastructure."

New SAN earns an "A" for performance

The EVA provides CQU with 2 GB/second, end-to-end Fibre Channel technology readiness and high-performance throughput for demanding applications. One of the first applications migrated to the EVA was the CQU payroll system, which now runs on an HP AlphaServer ES40 4-way system with the HP Tru64 UNIX operating system. The conversion to the AlphaServer system and EVA SAN storage cut payroll-processing time from nine hours to just 90 minutes, a reduction of more than 80 percent.

In the wake of the successful payroll system migration, the CQU IT team is also migrating many other mission-critical applications to the EVA, including Oracle databases, PeopleSoft solutions, and critical teaching and research systems.

"The HP StorageWorks EVA system's performance is phenomenal," Yarrow emphasizes. "The combination of the HP AlphaServer ES40 system and EVA delivers tremendous throughput. The EVA is a solid storage foundation, which we will build on as we centralize our storage resources as much as possible. Not only did we consolidate servers and storage, but we expanded our services offerings because we have the performance and capacity to do so."

Storage utility promises best-in-class data management

One of the key goals for CQU IT is a transparent storage utility, which will reduce overall storage costs and data management while increasing disaster resilience. To achieve these objectives, CQU departments are purchasing host bus adapters for their servers to enable the servers to tap into the school's SAN.

"Many of our departments buy their own storage and maintain their own computing environments," Yarrow notes. "By moving departmental DAS to our SAN fabric, we can provide better business continuity and more fully utilize all of our storage resources. With our HP StorageWorks SANs, we can provide whatever storage a department needs, and do that cost effectively. In this way, we also encourage collaboration between IT and departments, which leads to a more enterprise-wide view of the university. We are beginning to work together more and achieve greater efficiencies in IT spending and operations."

Yarrow points out that by entrusting storage management to centralized IT, the departments gain the benefit of professional data management and disaster protection. The CQU HP StorageWorks SANs support centralized backup and data transfers over a Gigabit Ethernet backbone network, which powers the main CQU campus. ATM (Asynchronous Transfer Mode) and microwave wide-area links connect CQU's many remote sites. These high-speed connections – supported by the SAN – provide students with 100 MB/second access to the university network and the Internet.

The HP StorageWorks EVA solutions all give CQU the ability to quickly make space-efficient documentation of critical data using the virtual snapshot (Vsnap) feature. Vsnaps allow CQU to take point in time copies of data, but only expand disk capacity to the amount that the data in the Vsnap changes. CQU also uses StorageWorks Continuous Access EVA extensively to replicate live data from one IT center to another.

According to Yarrow, "These HP StorageWorks EVA capabilities improved our disaster recovery and business continuance preparedness tremendously. By consolidating storage from all over the university and using these tools, we are protecting a greater percentage of our critical data than ever before. For a university, critical data can be anything from doctoral dissertations and research, to administrative payroll and student academic records."

A textbook example of ILM benefits

Recently, the university implemented two new HP StorageWorks solutions to enhance data protection, archiving, and file retrieval even further – StorageWorks Reference Information Storage System (RISS) and the StorageWorks 6000 Virtual Library System. The RISS active-archiving solution uses StorageWorks Grid technology to securely store and provide access to data through content-based indexing.

"We're really excited about our HP StorageWorks RISS solution," Yarrow notes. "This will take us to the next level in our information lifecycle management plans. We will use the RISS solution initially to archive Microsoft® Office documents and information from all over the university. We anticipate that the RISS system will free a great deal of our Fibre Channel SAN storage. Users will still have access to their documents and data, *and* we in IT get a more cost-effective approach to manage older or less critical information."

The university will also use StorageWorks RISS extensively to archive video transcripts. "The HP StorageWorks RISS gives us a total solution to manage archiving and retrieval from a wide variety of sources and in many different formats," Yarrow says. "For video archiving, the HP RISS handles metadata that makes it easy to index transcripts, which is really important when you are producing 200 hours a week of video. This is going to be a key service for students and faculty – we anticipate tens of terabytes of archive storage in the future."

CQU is also applying StorageWorks technology to improve and accelerate backups. CQU recently implemented the HP StorageWorks 6000 Virtual Library System, a disk-to-disk backup solution that seamlessly emulates popular tape libraries and tape drives.

Graduating to significant IT improvements and longer-term planning capabilities

According to Yarrow, CQU was able to integrate the StorageWorks VLS into its existing backup strategy and processes with little effort. "While it's still early, we anticipate significant improvement in our overall backup window and less administrative overhead throughout our backup process," he explains. "All of our new StorageWorks solutions, combined, are making our data more secure – and increasing our business continuity

preparedness. Offsite recovery will be far easier with the data backup and data replication capabilities that HP StorageWorks systems deliver."

Yarrow adds: "HP proved to us that we can do long-range IT planning based on the HP roadmap for storage and server systems. It's usually very difficult to plan our IT needs more than two years in advance, but with HP storage, in particular, we can plan much further ahead. This is especially important for an educational institution where budget pressure is always a concern."

About Central Queensland University

Central Queensland University (www.cqu.edu.au) is one of Australia's most innovative and richly diverse universities. With a network of campuses situated along the east coast of Australia, and international operations extending into the Pacific and South-East Asia, CQU provides a wide choice of locations at which to study. Central Queensland University was established as the Queensland Institute of Technology (Capricornia) in 1967. In 1991, an Act of Parliament officially proclaimed the school Central Queensland University.

At a glance

Hardware:

- HP StorageWorks Enterprise Virtual Array (EVA) SAN with 2 GB/second Fibre Channel switches and host bus adapters supports storage consolidation and virtualization for mission-critical applications

- 3 HP StorageWorks Enterprise Virtual Arrays – models EVA3000, EVA5000, and EVA8000

- HP StorageWorks Reference Information Storage System (RISS)

- HP StorageWorks 6000 Virtual Library System (VLS)

- HP StorageWorks 16-port Fibre Channel switches

- HP StorageWorks TL891 DLT tape library

- HP AlphaServer ES40 4-way servers

- HP OpenView Storage Management Appliance

- HP ProLiant servers, including models DL380 G2, DL360, and 5500

Software:

- HP StorageWorks Continuous Access EVA

- HP OpenView Storage Operations Manager

- HP OpenView Storage Management Appliance software

- HP LiteTouch web-enabled storage-management tools

- HP Tru64 UNIX operating system

- HP TruCluster Server

- Legato NetWorker

- PeopleSoft student-administration applications

- Oracle database applications

HP Services:

- HP enterprise consultation on SAN and server sizing

- Hardware and software configuration and installation

- HP TruCluster Server training

- SAN implementation

- Training at the HP Colorado Springs Center (USA)

- Ongoing 24x7 Gold technical support

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Business challenges

- Build and refine a comprehensive storage architecture to support a far-flung international university and its 24x7 environment
- Consolidate multiple islands of server and array storage into a cohesive, virtualized storage pool with single-pane-of-glass management
- Automate and streamline ILM, including reduced backup management and better disaster recovery and business continuity resources
- Create an adaptive IT environment that provides the flexibility, scalability, and robust character to support faculty, administrators, students, and parents

HP solution

- Implemented advanced storage solution based on HP StorageWorks and OpenView solutions
- Storage architecture based on HP ENSAextended vision enables CQU to provide efficient, secure data-storage capacity to all university departments.
- Automated and accelerated backups using HP StorageWorks Virtual Library System
- Implemented comprehensive ILM strategy using HP StorageWorks RISS

Customer results

Simplicity
- HP StorageWorks Enterprise Virtual Array and other StorageWorks SAN technology allows storage centralization and server consolidation, reducing management tasks and letting a busy IT staff manage more storage resources.
- HP StorageWorks RISS solution uses HP StorageWorks Grid technology to offload non-essential and/or older files and data, freeing fast, Fibre Channel storage for mission-critical support.

Agility
- Storage consolidation through HP StorageWorks SAN systems results in greater staff efficiency and business agility.
- Highly available HP servers, SAN storage, and mission-critical services help the university serve students, faculty, and staff around the globe on a 24x7 basis.

Value
- High-performance HP storage and server infrastructure reduces payroll-processing time by more than 80 percent.
- High-density HP StorageWorks SANs save valuable computer-room floor space.

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