Customer profile
Curtin University of Technology is Western Australia’s largest university and maintains Australia’s third-largest international student population.

Industry
Education

Location
Western Australia
New South Wales (Sydney)
Malaysia
Singapore

Solution
Backup and recovery
Deduplication
Virtualisation
Cloud computing

EMC products
EMC Avamar
EMC NetWorker
EMC Data Protection Advisor
EMC CLARiiON
VMware vSphere 4

Benefits
• Completed daily full guest and image-level backups for VMware environment
• Full backups reduced from more than 24 hours to three hours daily
• Data recovery time improved from a few days to under an hour
• Saved more than AUD$100,000 in tape costs

Curtin University of Technology is Western Australia’s largest university and houses Australia’s third-largest international student population. The university operates campuses and education centres at 16 locations across Western Australia, including a main campus in Perth. Other sites include Albany, Esperance, Kalgoorlie, Karratha, Margaret River, Northam and Port Hedland. It also has a campus in Sydney and has established a growing presence in South East Asia, with facilities in Singapore and Sarawak, Malaysia.

Curtin University of Technology hosts more than 44,000 students at any one time, including 18,500 international students. It also has about 3,200 full-time equivalent staff positions, which, given the high level of part-time and sessional staff, translates to about 7,000 employees.

The university’s IT department provides IT services to its Western Australian locations, while it partners with a vendor to deliver IT programs to its Sydney and Singapore campuses. In Malaysia, a local provider delivers limited services, while the IT department looks after broader strategic issues.

Curtin University of Technology plans to become one of the top 20 universities in Asia by 2020. To achieve this goal, it has planned exponential growth in research, and continued improvements in teaching and course curricula. The IT department is also playing a key role by delivering services more efficiently and effectively.

To do this, the department is consolidating the number of ‘strategic’ IT vendors that have a presence at the institution. It is then working with the selected vendors to understand their product roadmaps and how their new technologies can solve the university’s future needs. The university has selected EMC to provide information infrastructure and information lifecycle management technologies, spanning data storage, backup and archiving.

Challenges
Curtin University of Technology is running two data centres with a production storage array replicating across both locations. This storage architecture supports a virtualised infrastructure based on VMware vSphere 4 and provides a foundation for the university to change the way it consumes IT.

The institution is planning to adopt a utility computing model, whereby computing resources are acquired and used as needed. This new approach—facilitated by consolidating its software, information and resources into internal and external clouds—is designed to deliver flexibility across pricing and usage, and enable the more responsive delivery of services to internal clients.

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Business overview
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We consider EMC to be part of our IT organisation here.”  
Peter Nikoletatos, Chief Information Officer

Technology. “This approach is flawed, because we are always paying for capacity that is not being utilised.”

The current approach means that every budget cycle, the IT department has to present its case to lease or buy more storage. This poses the risk that the department may have to maintain storage hardware beyond its planned end of life, which could cause support, maintenance and performance difficulties.

The new approach is prompting Curtin University of Technology to re-evaluate its storage needs as its existing EMC CLARiiON storage systems reach end of life. “The replacement model is going to provide us with a platform to move into cloud computing, so we’re evaluating market-leading products such as the EMC cloud-based enterprise storage arrays,” said Nikoletatos.

An Alternative to Tape

The institution realised that meeting growing demand and supporting this new IT service delivery model required it to establish a more robust, resilient backup system. The IT department found tape could not provide the scalability or flexibility to properly back up the growing VMware infrastructure or the data generated by new digital services used by staff and students.

These problems were exacerbated by the fact the university had not removed any redundant copies of data in its backup systems. Vast quantities of data were stored even though they were unlikely to be accessed again. The amount of data had climbed to approximately 80 terabytes in early 2010 and 35 terabytes of data were being sent over the institution’s network each week.

“We were facing immense difficulties backing up data from 300 virtual servers to tape within a 24-hour period,” said Nikoletatos. “This placed a significant obstacle to the expansion of our virtualised infrastructure.” The institution needed to ensure reliable backup and recovery as this infrastructure ran critical applications such as an Oracle Database, FinanceOne accounting and financial software, Microsoft Exchange Server email, Blackboard education software, and other education-related applications.

Tape backup also presented an unacceptable risk to business continuity. “With many tapes stored on campus during our backup cycle, we may have faced problems accessing them in the event of an incident such as a pandemic or environmental disaster,” said Nikoletatos. In addition, the tape backups were occasionally incomplete, increasing the risk of data loss. The university also had to run separate backup products for its VMware virtual machine images, as well as Microsoft SQL Server, Microsoft Exchange Server and Oracle databases.

EMC solution

To improve backup performance and reliability, and lower operating costs, Curtin University of Technology evaluated EMC’s backup and recovery products with integrated data deduplication. “We found that the EMC products could reduce our risk, because we could store data in a digital format off the university’s premises through efficient replication over existing network links,” said Nikoletatos. “The other significant benefit was the ability of the product-set to intelligently evaluate and deduplicate our data, reducing the load on our storage systems and network bandwidth while still providing daily full backups.”

Curtin University of Technology is now leveraging an EMC product suite for backup and reporting across the VMware vSphere 4 infrastructure, which comprises 530 virtual machines running on 120 physical hosts. EMC Avamar backup and recovery software provides integrated deduplication, while
EMC Data Protection Advisor delivers detailed backup monitoring and reporting, and EMC NetWorker is used to back up rich media content.

Deploying EMC Avamar, EMC Data Protection Advisor and EMC NetWorker has ensured that the university’s infrastructure can support plans to increase its use of virtualisation. “While virtualisation was an ideal way to optimise our server fleet, our traditional storage and backup model was limiting our ability to automate and provision services quickly,” said Nikoletatos.

The university is now assessing what EMC cloud-based platforms and management tools can be used to support its cloud computing plans. These include the EMC Atmos on-premises cloud storage platform and the EMC Archer governance, risk and compliance software. To complement its internal cloud, the university is piloting an external cloud service provided by Optus Business based on technologies from EMC, VMware and Cisco.

Backup Bottlenecks Eliminated
With EMC Avamar, the university is now performing fast, daily full guest or image-level backups, and recovering data in a single step. By deduplicating backup data at the source, EMC Avamar eliminates backup bottlenecks, and by deduplicating backup data globally, it reduces the amount of disk storage required. “EMC Avamar significantly improves backup performance and deduplicates our data, which gives us greater flexibility to provision and protect new virtual machines,” said Nikoletatos.

Backup Times Reduced
Using EMC Avamar, the university performs fast, nightly full backups for its 530 virtual servers, using existing network bandwidth. This previously took almost 24 hours to complete. EMC Avamar also controls backups for all operating systems and integrates with all applications. Five remote site backups and replication to the university’s main data centre now only takes 15 minutes to two hours each night, with all server backups completed within the 6pm-to-6am backup window.

At present, the backup extends only to servers, but the institution is considering extending Avamar to protect desktops and laptops. “Our backup data deduplication ranges from 95 per cent to over 99 per cent across all of our key applications and databases, averaging 98.7 per cent overall. The performance we are seeing with EMC Avamar is incredible,” said Nikoletatos.

Staff Redeployed and Recovery Undertaken with Confidence
Deploying EMC Avamar has enabled Curtin University of Technology to redeploy at least two full-time equivalent staff and eliminate the need to purchase additional tapes. “We can save more than AUD$100,000 in tape costs alone,” said Nikoletatos. “And with two IT staff redeployed to help us focus on our data centre strategy, the total savings are even greater.”

With EMC Avamar in place, Curtin University of Technology has gained far greater confidence in its ability to recover data in the event of an incident. A recent example saw the institution recover a Microsoft Exchange mailbox in 30 minutes rather than the two to three days required under its previous system. “I’m not up at night worrying about how I would recover data if something went wrong,” said Nikoletatos. “EMC Avamar’s robustness means we can be confident that data can be quickly recovered when needed.”