eResearch innovators drive discovery through collaboration

eResearch SA gives researchers 40 times faster access to secure data with highly scalable, easily manageable cloud platform

Customer profile

eRESEARCH SA

Company	eResearch SA
Industry	Technology, Education
Country	Australia
Employees	>100
Website	www.ersa.edu.au

Challenge

eResearch SA wanted to further eResearch methodologies in South Australia with reliable, high-speed and open access to big data, while expanding services and revenue over time.

Solution

The university joint venture created an open-source cloud and high-performance computing infrastructure based on Dell™ PowerEdge servers with a Dell Networking Active Fabric solution managing traffic and secured by SonicWall next-generation firewalls.

Benefits

- Researchers gained 40 times faster access to data
- IT team predicts 40 percent reduction in administration time
- Universities further green agenda with 25 percent greater energy efficiency
- Gains flexibility with open-source cloud technology
- IT team maximizes security with no loss of performance

Solutions at a glance

- Cloud Computing
- Data Center Virtualization
- Networking
- Network Security
- Server
- Support Services

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Mary Hobson, Executive Director, eResearch SA

> "The key benefit is what we call the South Australian eResearch network capability. It means that other institutions can plug directly into our network and gain access to our services at 40 Gbps, rather than standard internet-based connectivity, which is slower and less reliable. Thanks to Dell, our connectivity is now 40 times faster, so researchers are able to use big data effortlessly."
>
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eResearch SA puts the power of advanced information and communication technologies to work for research purposes, facilitating better collaboration, data management and sharing. Established as a joint venture between the University of Adelaide, Flinders University and the University of South Australia in 2007, the venture aims to support discovery and innovation through the development and implementation of eResearch methodologies in South Australia.

eResearch SA forms one part of the federally funded National eResearch Collaboration Tools and Resources (NeCTAR) project.

The backbone of any successful eResearch initiative is an infrastructure of fast, high-capacity networks, protected with firewalls and scalable data storage that gives researchers open, yet secure access to the data they need. With just one gigabit-per-second (Gbps) speed at desktops and no dedicated research networks or storage connecting the campuses, the universities were unable to deliver capabilities in line with the NeCTAR vision.

Universities gain unrivalled agility and expertise

eResearch SA started researching solutions that could provide cloud-based open access that is fast and cost-efficient, while offering the performance to handle large volumes of data and many concurrent connections. The solution would also have to scale to meet future needs. Mary Hobson, Executive Director, eResearch SA, says, "After researching multiple vendors' capabilities, we knew that the Dell proposals and support were right for us. Only Dell offered a flexibility that would allow us to easily scale to meet future requirements. Also, the organization's integrated service and proven capabilities in the research field added great value."

The eResearch SA team worked closely with Dell Services at a series of technical architecture and design workshops. Dell also implemented and configured the solution. Hobson explains, "Working with Dell Services was a very rewarding experience. They delivered above and beyond what can be expected from most solution providers. We received detailed support at every stage as they helped us work through the challenges and met every one of our objectives with cost-effective proposals."

Technology at work

Hardware

Dell IT Consulting Services

Dell Enterprise Deployment Services

Dell Support Services – Dell ProSupport with Next Business Day Onsite Service

Hardware

Dell PowerEdge C6145 server with AMD® processors

Dell PowerEdge R720XD and R620 servers with Intel® Xeon® processors

Dell Networking 5548 switches

Dell Networking Z9000 core switch

Dell Networking S4810 High-Performance 10/40 GbE Switch

Dell Networking S60 High-Performance 1/10 GbE Switch

SonicWall SuperMassive 9600 next-generation firewalls

Software

SonicWall Comprehensive Gateway Security Suite

Dell Networking Operating System

Dell OpenStack-Powered Cloud Solution

Dell OpenManage

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Research supported with 40 times faster data access

Researchers can now collaborate across vast spaces and multiple disciplines, sharing insight and gaining access to the data they need to be more productive. Users are able to transfer terabytes of data in minutes instead of days.

eResearch SA built a high-performance storage and network infrastructure across two data centers. University of South Australia hosts the NeCTAR cloud on 14 virtualized Dell PowerEdge C6145 servers with AMD® processors, as well as five PowerEdge R720XD servers and five PowerEdge R620 servers with Intel® Xeon® processors connected to 10-petabyte storage at the University of Adelaide.

The high-performance and high-density networking solution includes two Dell Networking Z9000 which act as core switches and 10 Dell Networking S4810 that are top of rack. Six Dell Networking S60 high-performance switches running the Dell Networking Operating System enable 1Gbps connectivity to storage interface. All Dell switches ensure low-latency and high network speeds between the servers and storage, helping researchers process data significantly faster.

Deploying an Active Fabric solution has made managing east west traffic while obtaining required performance easier for eResearch SA. Additionally, the solution can easily scale to meet growth requirements without demanding more physical space. Hobson says, "The key benefit is what we call the South Australian eResearch network capability. It means that other institutions can plug directly into our network and gain access to our services at 40 Gbps, rather than standard internet-based connectivity, which is slower and less reliable. Thanks to Dell, our connectivity is now 40 times faster, so researchers are able to use big data effortlessly."

Open-source technology delivers flexible, cost-effective cloud

The architecture is offered in the form of an Infrastructure-as-a-Service (IaaS), based on the Dell OpenStack-Powered Cloud Solution. As OpenStack is open source, eResearch SA was able to create a differentiated cloud model that suits its research needs best. There are also no licensing fees. "Performance and cost-effectiveness are both central characteristics of our Dell-powered cloud system. The PowerEdge C Series servers have helped us achieve the right investment balance – cost, capability and performance," comments Hobson.

IT team set to reduce administration time by up to 40 percent

The eResearch SA team has minimized administration by managing its environment using Dell OpenManage, a set of systems management applications. Paul Bartczak, IT Infrastructure Manager, eResearch SA, explains, "We're predicting a 30 to 40 percent increase in efficiency thanks to the single-pane management through Dell OpenManage that lets us easily perform network and server monitoring, reporting and upgrades. We needed a system that we could manage ourselves and that would consistently deliver the required service levels and with Dell, we have achieved this."

Achieves high performance without compromising security

eResearch SA implemented two SonicWall SuperMassive 9600 next-generation firewalls (NGFW) for deep security at multi-gigabit speeds. "We needed a highly available and secure firewall solution which would be able to deal with high throughput without choking our 10Gb networks. The SonicWall solution met our requirements and is helping us achieve deep threat prevention with cloud-assisted anti-malware, advanced intrusion prevention, high-speed SSL inspection and granular application control," says Bartczak.

The SonicWall NGFWs detect and block sophisticated threats before they enter the multiple internal and external network zones, with minimal latency for every connection. The IT team is instantly notified if a virtual machine is compromised, and balances the need for high security against threats with easy accessibility for authorized users. The team also uses the single intuitive user interface to enforce policy decisions while slashing management burdens.

"Protecting the credibility of data is essential to reliable research. With the SuperMassive firewalls, we're able to meet stringent compliance laws without sacrificing system performance or a lot of our time," says Bartczak. "The SuperMassive firewall automatically distinguishes threats by creating the rules necessary for inter-LAN communications, which are deemed to be "trusted" zones. This minimizes administrative time, a feature that we find is often missing in other firewall solutions in the market," he adds.

Moreover, eResearch SA has observed that other security solutions would have impeded network performance whereas the SonicWall SuperMassive solution helps protect the network while delivering consistent performance. While comparing 10Gb firewalls, Bartczak and his team found that with all security features turned on, especially IPS and IDS (Intrusion Prevention, and Intrusion Detection Services), other devices due to their hardware architecture, would not be able to maintain the required throughput and only deliver 6Gbps on a 10Gbps interface. Bartczak comments, "With the SonicWall SuperMassive firewall easily integrated with the Dell Active Fabric solution, we are able to maintain network performance without sacrificing security. Other security solutions in the market would have increased our bandwidth consumption by around 40 percent, instead of maximizing it to its full capacity."

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>
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University data centers use 25 percent less electricity

The universities are committed to sustainability and energy efficiency is a top priority. The data centers were not initially built to host vast numbers of devices and also have strict power limitations. The current solution is made up of dense, high-performance systems that operate at around 80 percent capacity, thereby maximizing space and other resources in the data center.

"We have to be very careful when selecting equipment. If it uses too much power or generates too much heat, the university will not allow it. We're lucky that in comparison to our legacy devices, the new-generation Dell solution is 25 percent more energy-efficient," states Bartczak.

Scalability and long-term partnership help prepare for future growth

eResearch SA is confident it can support continued expansion. Its Dell servers currently host 1,970 virtual machines (VMs). Over time, the architecture will grow to more than 3,000 VMs. This will help the universities achieve their goal of implementing new services and improving existing ones to further enhance their offering. Through high-performance eResearch capabilities they can increase income to help subsidize future activities.

Hobson says, "We can expand our services and income thanks to our highly scalable Dell environment. That's one of the reasons we chose Dell. We also wanted a long-term partner, as our infrastructure and service delivery requirements grow and mature over time. We're looking forward to rolling out phase two of the NeCTAR project with Dell, which will include network expansion and other possible ventures."

IT is confident of maximum uptime

The eResearch SA IT team is working with Dell ProSupport to maintain uptime and opted for ProSupport with Next Business Day Onsite Service. In addition to 24/7 phone support and remote access to Dell experts, the team receives in-person assistance for even faster problem resolution. "Due to the high level of redundancy, we're confident of the continued performance of our Dell solution. But in the event of any issues, we have the peace of mind that Dell ProSupport will help resolve them quickly," concludes Bartczak.

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