



<b>Customer name</b>
Department of Education and Training Western Australia
<b>Country</b>
Australia
<b>Industry</b>
Government
<b>Business challenge</b>
Improve flow of internet traffic across the network
Build platform to deliver high-end teaching and learning applications
Lay foundation for future delivery of online curriculum services
<b>Solution</b>
Refresh Cisco routers to 800 schools
Upgrade core network to 10Gbps
Investigate Cisco WAN Optimisation
Enable unified communications
<b>Results</b>
Single vendor providing end-to-end solution
More open communications and better understanding of business and technology needs
Increased flow of network traffic and improved performance

### WA Education Department and Cisco deliver advanced end-to-end e-learning solution to more than 800 schools and colleges

“Cisco is keen to understand our business and it has a high-quality product range that meets not only our business needs but also our specialised teaching and learning needs. The other big plus is Cisco has a presence in WA and most networking companies don’t.”

Glenn Veen, Infrastructure and Telecommunications Manager, WA DET

#### Introduction

The Western Australian Department of Education and Training (WA DET) is responsible for providing a quality learning environment across the state. This includes looking after more than 800 schools and 10 Technical and Further Education (TAFE) Colleges, spanning a vast area of 2.5 million square kilometres.

Several years ago WA DET had a strategic vision to introduce fast internet connections, as part of a broader e-learning project, aimed at delivering a range of high-quality curriculum services to all schools. Today three-quarters of schools have a 10Mbps broadband service. The rest have between 1Mbps and 10Mbps connections, with 37 schools using satellite links.

“By providing centralised internet to all schools, we significantly reduced costs, created efficiencies and enabled high-quality services to be delivered to schools,” says Glenn Veen, Infrastructure and Telecommunications Manager for WA DET.

The department also saw the benefits of developing a standard operating environment (SOE) and it was eager to standardise networking equipment, including routers, switches and wireless, for all schools.

## Business challenge

With 830 schools spread across the state, WA DET has seen the enormous benefit of high-speed networking in delivering a range of curriculum services, including those used in teaching and learning, professional development, collaboration and other online communications.

"In the early days, we saw kids using Google images and stuff like that," says Veen. "Now our top kid websites are curriculum content sites. It's a massive change to see legitimate curriculum sites being targeted by students."

In addressing the rapid changes in the way students are using technology to learn and interact, the department has been collaborating with Oracle to develop its Online Teaching and Learning System (OTLS), based on Oracle's Learning 360 (L360) software. The Oracle L360 application engages the entire school community by gathering and analyzing student information.

"Over the past couple of years, we've had a good look at what Oracle L360 does to things such as bandwidth, network traffic and, as a result, we're seeing a growth in demand for internet-type traffic," Veen says.

According to Veen, it became increasingly obvious that WA DET needed to upgrade its Cisco infrastructure so it could accommodate the growing demand by schools using its existing network for its online curriculum services.

"Internet traffic was putting enormous demand on our network. Each month the network was downloading between 11 and 17 terabytes of data and some 122 million inbound emails. It was clear we needed to refresh our routers as well as upgrade our core network from a 1Gbps to 10Gbps backbone," Veen says.

In deciding what solution it needed, WA DET considered the future growth and expansion of the network, as well as the possibility of distributing voice, video and other graphic-rich digital content, particularly as the department further exploits the capabilities of the OTLS.

"There aren't too many organisations around the world that have such a large corporate environment, with more than 800 sites and high-volume bandwidth being pushed through a single core," Veen says. "With the constant increases in traffic demand, you have to stay two steps ahead."

## Solution

WA DET offered Cisco a single vendor contract for all networking equipment. It also awarded a five-year preferred supplier contract to Alphawest to supply and maintain the Cisco network.

"We went with Cisco because it's the only vendor that could provide a full end-to-end solution," Veen says. "We already had Cisco equipment in place so it also made sense to go with a vendor who had a significant investment and understanding of DET."

The first stage of the project was to refresh the routers serving 800 schools and, in time, the state's 10 TAFE Colleges spread over 83 campuses to improve internet traffic flow. WA DET has three teams deploying the new Cisco Integrated Services Routers, which incorporated voice provisioning, to 15 schools a day.

In addition to increasing core network capacity to 10Gbps, the department is upgrading its data centre by installing new Cisco Catalyst 6500 switches, wireless technology, firewalls and the new Cisco Application Control Engine (ACE) application switch, which optimises application availability, performance and security.

"If you're delivering high-end e-learning applications like Oracle's L360, it's important you have a simple, manageable, value-driven infrastructure underpinning it. We have that now with the upgrade of the Cisco network," Veen comments.

"The partnership between Oracle and Cisco is very important to us in terms of managing network traffic flow better as we develop our OTLS solution to deliver a higher quality service to schools."

WA DET also anticipates that the Cisco Wide Area Application Services (WAAS) solution will provide necessary WAN optimisation to assist the department in managing bandwidth use as it begins a large-scale roll-out of OTLS.

"With the WAAS boxes, we're predominately looking at such issues as latency and content delivery. The OTLS deployment, based on Oracle L360, is still in its early days, but looking forward, distributing rich content such as graphics or movies to 30 kids in a classroom may well be resolved using the WAAS boxes," says Veen.

"Already, we're seeing a nine-fold improvement in the delivery of certain traffic by using the WAAS boxes. As OTLS is only in release 2, with deployment to a further 100 schools expected in 2009, Cisco WAAS may solve the problem of broadband performance in some schools."

The next phase will be the deployment of unified communications, including voice and video content. "The foundation has been laid for that," says Steve Arbuckle, Customer Solutions Manager at Alphawest. "We've been enabling all the technology whenever DET chooses to go down that path."

According to Veen, the upgrade also allows WA DET to look at peer-to-peer network traffic between schools rather than the hub-and-spoke model that pushes everything through a single core. "As we introduce new content such as voice and video, we'll want schools to communicate with one another, rather than coming through the core."

## Results

### Single point of contact

A single vendor platform offers a more powerful solution than multiple vendors and contracts. "If you don't have a single supplier, it's difficult to know who to partner with to address new challenges. It can end up a bit of a pig's breakfast," says Veen. "With Cisco, we have everything we need to build a network solution, from end to end, that can deliver powerful e-learning tools, such as the Oracle L360 application."

### More open channels of communication, easier deployment

By having preferred supplier contracts, Cisco and Alphawest are better able to communicate and better placed to understand the department's business needs.

"The business we're in is not your standard business," says Veen. "There aren't many organisations where the bulk of users sign on every 40 minutes; it has an impact on network flow."

"That's the benefit of a preferred supplier contract – it reinforces your standard operating environment. In this case, we can only buy Cisco equipment. It's a better outcome for us and makes it easier when it comes to supporting the Oracle L360 application layer."

With a standardised Cisco infrastructure in place, it is easier to both upgrade the network and roll out the Online Teaching and Learning Solution. According to Veen, "With an SOE, we can get a school operating OTLS in an hour or two. If they don't, it can take a few days."

### Improved network capacity and performance

The network upgrade and router refresh have enabled WA DET to optimise its wide area network and improve the flow of traffic between the department and schools. It has also laid the foundation for future applications such as VoIP, video and video conferencing.

"With the increased router capacity, we were able to improve throughput, but it wasn't only about bandwidth. Latency was an issue with places like Broome and Kununurra. The WAAS boxes we're testing will help improve performance, take out all the chatty traffic flowing down the network."

The upgrade was also crucial in delivering the online learning application to schools, which will help provide a more open and engaging teaching and learning environment for students, teachers, parents and the education department.

## Future plans

WA DET has begun to redesign the network to meet the growing demands placed on it by schools. In the longer term, Veen says the department is looking to take greater advantage of the network capabilities to reduce the number of servers in schools.

"Rather than having servers, we'll have appliances. It's a good carbon story too. The smaller the infrastructure fleet, the cheaper it will be to run and the lower the carbon output will be."

The department also hopes to simplify the network by building more intelligence into it.

"It is a complex, two-domain network at the moment – one for students and one for administrators," says Veen. "We're hoping it will become with time a flatter network, using products such as single sign-on."

"It would involve Cisco putting in more intelligent switching on the network rather than intelligence in devices in schools; making the technology less complex. At the end of the day, what we're really trying to achieve is to make life at the teaching and learning end a lot simpler for everyone."

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