BROCADE

SUCCESS STORY

Foothills School Division

EXECUTIVE SUMMARY

Challenge

Replace an obsolete network to gain superior wireless performance, VMware integration, and scalability for the future

Solution

- Brocade VDX 6740T Switches with Brocade VCS Fabric technology for network core
- Brocade ICX 7450 Switches for distribution
- Brocade ICX 7250 Switches for access and PoE+ capabilities
- Brocade Network Advisor for simplified management

Results

- Eliminated dropped packets, improving network reliability and user satisfaction
- Gained up to 40 GbE and advanced enterprise capabilities with an education institution budget
- Integrated easily with existing VMware and storage environments, simplifying administration and operations
- Achieved on-demand scalability

The Right Network Provides a Path to the Future

Foothills School Division (FSD) is located on southern edge of Calgary, Canada and serves 8,200 students in pre-kindergarten through Grade 12. The division spans 25 locations, including 19 public schools, an open campus location, and three Hutterite Colony schools. The Alberta SuperNet—a high-speed fiber optic network that connects more than 4700 government agencies around the province of Alberta—connects all FSD school locations and provides Internet access.

Catching Up to Rapidly Growing Network Usage

Like many school divisions and districts, FSD's teachers and students are relying increasingly on wireless devices and digital curriculum. Teachers use their own wireless devices, and FSD adds approximately 500 new wireless student devices each year. In 2015, they added 500 Chromebooks in just two months. However, the existing Cisco wired network couldn't keep up. Outages were common, and the Cisco switches in the schools frequently dropped packets, which degraded voice quality for Voice over IP (VoIP) phone service and the wireless network.

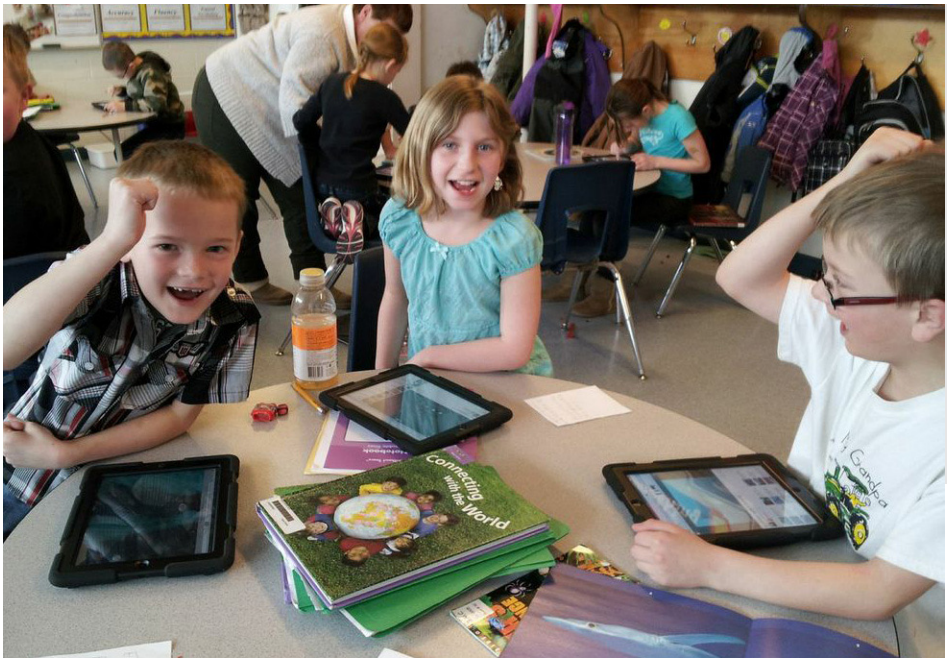
"We needed the right network in place to support our teachers and students," said Eelco Wouters, Lead System Analyst at Foothills School Division. "That meant significantly upgrading our wired infrastructure and deploying a new wireless network as well."

FSD had a list of specific technical requirements for a new network. The new network core had to support 10 Gbps capabilities. The new network had to integrate with FSD's VMware environment and Hyper-V hypervisors, which support virtualized servers and a Virtualized Desktop Infrastructure (VDI) environment for remote technicians and desktops. The existing storage environment required a network that supported Network File System (NFS) over the core for replication and backup. FSD also needed support for Differentiated Services Code Point (DSCP) on its switches in order to perform Quality of Service (QoS) tagging and achieve the proper service level across SuperNet for multiple types of traffic. Multicasting support and subnet-directed broadcast support was needed for the schools' paging systems. FSD wanted to segregate VoIP traffic onto its own VLAN to optimize voice performance and control. Finally, the new network solution had to make migration easy.

WHY BROCADE

"Everything works. We gained 40 GbE capabilities, which we never expected to have, for what we expected to pay for 10 Gbps. The new network supports continued growth of voice, video, and wireless traffic and we also got enterprise-class capabilities. We truly got more for our budget and have the right network in place."

— Eelco Wouters, Lead System Analyst, Foothills School Division



And There Was the Budget Issue

Wouters began by comparing costs and testing equipment among several different vendors, including Brocade. The existing vendor was prohibitively expensive, and obtaining service had been a nightmare. Dell switches lacked several required capabilities. Alcatel Lucent equipment wasn't available for testing, and the HP solution necessitated a steep learning curve. Wouters and Aaron Johnston, System Analyst III at Foothills School Division, had previous, although limited, familiarity with Brocade® switches and began testing Brocade switches in-house.

"We chose Brocade because we received more capabilities for far less budget," said Wouters. "Brocade is a good fit for what we need, and they are really supportive. In addition, the lifetime warranty on the Brocade ICX® Switches is real—it's not limited by restrictions in the fine print. It was a great decision."

Putting the Network in Place

FSD deployed Brocade VDX® 6740T Switches with Brocade VCS® Fabric technology for its network core at headquarters and school board office locations. The Brocade VDX family of switches delivers powerful data center performance, flexibility, and efficiency, ideally suited for cloud and virtualized environments. The Brocade VDX Switches also provide advanced storage support features, such as Data Center Bridging (DCB). This feature enables storage traffic to be reliably exchanged over the LAN network, eliminates packet loss when network congestion occurs, and allocates bandwidth as needed to keep the network running efficiently. The Brocade VDX Switches also support 40 GbE, which FSD can tap into when needed.

Brocade ICX 7450 and Brocade ICX 7250 Switches are deployed in the schools for aggregation and access. They deliver wire-speed, nonblocking performance across all ports to support latency-sensitive applications, such as real-time voice and video streaming.

Brocade stacking technology also makes it easy to scale. Up to 12 stacked switches are seen as a single switch, simplifying management. FSD uses a Distributed Chassis deployment model, which enables connections to switches over a distance—up to 80 km—while minimizing cabling costs by up to 50 percent.

"The network was pretty simple to deploy," said Johnston. "Brocade helped us with the initial configurations, and we did the rest ourselves. Everything is humming along. As existing access switches fail, we immediately replace them with Brocade switches."

"Having a Brocade team locally is wonderful," added Wouters. "They know our organization and they know us. They're responsive, and because of that strong connection, it helps us make good decisions."

An Immediate Performance Improvement

With Brocade VDX Switches in the core and Brocade ICX Switches distributed across the division, FSD now has a powerful underlay network for the new Aruba wireless network, which is being deployed. In spite of steady growth in wireless traffic, the schools are not oversubscribed and all desktops now have wireless access.

"When we first replaced the network core and edge switches, we noticed an immediate increase in performance," said Wouters. "The new network also eliminates Spanning Tree issues and allows us to send both network and storage traffic over the core with automatic bandwidth allocation. That went a long way towards eliminating our dropped packet problems."

Brocade VCS Fabric technology also enabled FSD to easily integrate the new network with its VMware environment and enhance performance. For example, automatic port profile migration dramatically simplifies moving virtual workloads. When a Virtual Machine (VM) migrates from one physical server to another, the associated port profile moves with it, saving time and effort for the storage team.

Scalability When—and Where—Needed

With the Distributed Chassis design, FSD can deliver network ports wherever they're needed, at a fraction of the cost of deploying additional switches and ports. Combined with Brocade stacking technology, this design future-proofs the network by allowing it to scale on demand.

Adding edge devices is also easier with the Brocade ICX Switches. They deliver power and data across network connections, supporting Power over Ethernet+ (PoE+) standards and providing a single-cable solution for wireless access points, VoIP phones, security cameras, and other devices. Optional modules for the ICX 7450 Switch can easily upgrade its uplinks from 1 GbE to 10 GbE to 40 GbE.

High QoS Improves User Experience

"The Brocade switches easily handle the capacity," said Wouters, "and they also provide the features we needed to ensure QoS for voice, videoconferencing, and multicast traffic. Trouble tickets and calls related to poor quality have disappeared."

Other local agencies host their Voice over IP (VoIP) phone services with FSD. In the past, dropped packets led to poor voice quality and performance. As a result, FSD received numerous complaints. Now, QoS is configured on the Brocade VDX Switches in the data center and on the Brocade ICX Switches deployed in each school at the network edge.

FSD connects to SuperNet at the network edge and pays for service depending on the level of QoS required by its traffic. Using DSCP on the Brocade switches, FSD implemented QoS tagging to segment its traffic into three queues. Bandwidth-intensive or latency-sensitive traffic, such as voice and videoconferencing, receive the highest QoS level. Wouters and Johnston also separated the VoIP phones onto their own VLAN for additional control over quality and simplified management.

"We hope to begin monitoring edge traffic more closely using Brocade sFlow network monitoring technology," said Johnston. "I expect it to give us even better visibility into traffic types across every port, for more fine-grained control and network cost savings."

Next Steps

"Everything works," said Wouters. "We gained 40 GbE capabilities, which we never expected to have, for what we expected to pay for 10 Gbps. The new network supports continued growth of voice, video, and wireless traffic and we also got enterprise-class capabilities. We truly got more for our budget and have the right network in place."

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