BROCADE

SUCCESS STORY

University Prepares for the Future with an SDN Foundation

EXECUTIVE SUMMARY

Challenge

Refresh the university network and add software-defined networking functionality to achieve automation, cloud connectivity, and cost reduction goals

Solution

- Brocade MLXe Routers for core routing and aggregation
- Brocade ICX 7450 Switches for edge switching
- Brocade ICX 6650 Switches for data center switching and VLANs
- Brocade SDN Controller and Brocade Flow Optimizer for SDN readiness

Results

- Deployed a future-ready SDN network foundation
- Increased data throughput, uptime, and student productivity
- Quintupled large data transfer speeds
- Reduced the time it took to manage and reconfigure the network from days to hours

Missouri Western State University

St. Joseph, Missouri was the American pioneers' last stop for supplies before heading west. Today in St. Joseph, Missouri Western State University prepares 6,000 students to head off into their futures with degree programs, experience-based learning, and community service. The campus also is home to the Kansas City Chiefs football team training camp, which relies on the campus network during pre-season preparation.

Looking Ahead to New Capabilities

The university's IT services organization provides on-campus computing resources and connectivity to external partners such as the Missouri Research and Education Network (MOREnet), which provides Internet connectivity and access to the Internet2 research network. The IT organization also supports connectivity to cloud-based services, such as Moodle, the university's open-source learning management system. Approximately 50 percent of the university's traffic flows to students and research partners at other institutions.

Missouri Western's previous network had supported the university for ten years, but today's security, wireless, cloud, and bandwidth-intensive application requirements exceeded its capabilities. Random hardware failures resulted in sporadic downtime and disrupted users. When connections went down, client devices had to be restarted, and computer labs came to a halt. Limited bandwidth to desktops and data bottlenecks also slowed application performance.

"We needed at least 1 GbE to each desktop and 10 GbE bandwidth across the network to remove data bottlenecks," said Fred Nesslage, Manager of IT Services for Networks & PC Support at Missouri Western State University. "I also wanted to deploy multiple 10 GbE uplinks and Power over Ethernet (PoE) to support the campus wireless network and hyper-connected students."

MISSOURI WESTERN STATE UNIVERSITY

As a team of one, Nesslage also wanted the new stackable switches to support the programmable capabilities of Software-Defined Networking (SDN) to simplify management, consolidate capabilities, and minimize costs wherever possible. SDN and virtualization would enable him to optimize network and service agility with minimal manual effort. Additionally, the dynamic and adaptable architecture would also prepare the university for future networking needs. The university received funding to upgrade the network at just the right time and Nesslage chose Brocade® solutions.

"We trust Brocade because the previous network had served the university well," he said. "Our Brocade team offered us several options and choices, and we chose Brocade MLXe Routers and Brocade ICX® 7450 Switches."

Out with the Old, In with the New

Nesslage deployed Brocade MLXe Routers in the data center core network to power the data center, university library, and administrative offices. Missouri Western's data center is 95 percent virtualized with eight VMware hosts running 60 virtual machines for authentication, Web, and file services. Eight additional Brocade MLXe Routers aggregate traffic across the campus.

Nesslage created a 10 Gbps Multiprotocol Label Switching (MPLS) backbone with Layer 2 Virtual LANS (VLANs) running across the Layer 3 infrastructure. Brocade MLXe Routers provide a rich set of capabilities, performance, and scale that make them ideal for high-performance environments. They are also SDN-ready to support the university's future solutions. The new backbone was immediately successful and eliminated data bottlenecks that had plagued campus users.

The university replaced its edge switches with Brocade ICX 7450 Switches in 35 wiring closets across 14 campus buildings. These enterprise-class switches can scale up to 40 GbE connectivity and easily support cloud, video, high-speed wireless, Voice over IP (VoIP), and high-performance research applications. Nesslage can scale the switches as demand grows, either increasing port capacities and/or stacking up to 12 switches into a single logical stack.

"I deployed the Brocade MLXe Routers first," said Nesslage. "There were no interdependencies, so it was easy. Next, I replicated our existing settings and staged the new switches and deployed everything within two months."

Stability and Nonstop Performance

The new network made a world of difference. Students no longer experience interruptions or lose productivity, even when hundreds log onto the network simultaneously. Large file transfers now move five times faster. When technicians deploy physical machines in labs, they can image them over the network in a fraction of the time that it took previously. The network easily handles all types of traffic—Windows authentication, Web browsing, videoconferencing, cloud-based ERP, and other administrative systems.

"The phone doesn't ring much anymore," said Nesslage. "With Brocade, I just configure it and forget it. Unless there is a major change, I never touch them. They just run."

SDN-Readiness for What's Next

With SDN readiness built into the Brocade MLXe Routers and Brocade ICX 7450 Switches, Nesslage can transition to SDN whenever relevant SDN applications are available. The university plans to deploy the Brocade SDN Controller with Brocade Flow Optimizer, which will enable Nesslage to implement SDN in the university's existing environment.

The Brocade SDN Controller is a fully tested, commercial version of the Open Daylight controller. It will enable the university to control physical and virtual networking devices from all major vendors, and comes with services to help create the university's own business logic, use cases, and custom network services. Brocade Flow Optimizer is a simple, open, and agile SDN solution that detects and manages large Layer 2 through Layer 4 flows in the campus network.

With SDN capabilities, Missouri Western can implement proactive monitoring and automate traffic management to optimize network availability, performance, and security. For example, Nesslage will be able to optimize specific network paths for large research datasets. Using an API, he can connect the Brocade SDN Controller and Brocade Flow Optimizer to the university's Palo Alto firewalls. This will enable firewalls to alert the Brocade SDN Controller when a specific traffic flow experiences a problem and enable closed-loop remediation for specific traffic flows.

"We're never assured of future funding," said Nesslage. "But now we have a future-ready network foundation that we can use for as long as possible to reduce operations costs and avoid purchasing more hardware to add capabilities. We can easily accommodate increasing bandwidth requirements, implement SDN capabilities, and handle whatever is coming."

WHY BROCADE

"Ultimately, we'd like to virtualize the entire network. We can plug in a device anywhere and it will be automatically recognized and self-configured for everything it needs to do. With Brocade SDN, that day is not far off."

— Fred Nesslage, Manager of IT Services for Networks & PC Support, Missouri Western State University

Easy Manageability Today

For a one-man IT team, the new network makes management much more convenient. It already has saved hours and days of time in preparing for the Kansas City Chiefs training camp. Each season, Nesslage configures specific VLANs to isolate the team's network traffic and support their applications. In the past, this job also meant reconfiguring edge switch ports. With the new Brocade solution, he completely reconfigured the necessary network connections in about six hours, getting the new season off to a fast start.

Nesslage can also count on support from Brocade whenever he needs it. "Brocade support is excellent. Whenever I have questions, my Brocade account team is extremely helpful. On the rare occasion when I had to call for support, it's very responsive."

Next Stop—the Future

As Nesslage looks forward, one of his first projects is to use SDN to improve Quality of Service (QoS) for Missouri Western's conferencing application. With the Brocade SDN Controller and Brocade Flow Optimizer, he can create policies to automatically control conferencing traffic flows and help deliver a better user experience.

"Ultimately, we'd like to virtualize the entire network," he said. "We can plug in a device anywhere and it will be automatically recognized and self-configured for everything it needs to do. With Brocade SDN, that day is not far off."

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