

Peter Kiewit Institute

EXECUTIVE SUMMARY

Objective

- Upgrade an aging network into a high performance, state-of-the-art network that supports bandwidth-intensive research and R&D applications
- Build and maintain a redundant, secure, high-speed infrastructure that can be positioned with business and industry as a real-world example
- Create a network that was a natural extension of the business-meets-technology learning environment

Solution

- Brocade FastIron SuperX high performance convergence switches in the network closets
- Brocade BigIron RX-16 Layer 2/Layer 3 Ethernet switches deliver 10-Gigabit Ethernet in the network core and provide full system redundancy (switch, management and power) for the PKI network

Results

- PKI operates a high-speed, easily scalable network with failsafe Brocade equipment that offers multiple redundancies and prevents outages and failures
- PKI counts on Brocade responsiveness to constantly help the Institute improve its network, application, and infrastructure performance

Elite Business Technology Institute Partners with Brocade to Build State-of-the-Art Network

Founded in 1996, The Peter Kiewit Institute (PKI) in Omaha is designed to help meet the needs of the nation's technology and engineering firms by providing a top-flight education to students interested in pursuing careers in information science, technology, and engineering. Its goal is to connect students directly to business and industry.

Students learn not only from faculty in two colleges—the University of Nebraska-Lincoln's College of Engineering and the University of Nebraska at Omaha's College of Information Science and Technology—but also from business leaders dealing with practical challenges. Students are plugged into a mixture of rigorous coursework and hands-on problem-solving.

Objective

PKI wanted to enable a state-of-the-art network for its testing, deployment, research, and development efforts. The Institute wanted its network traffic to travel on a redundant, secure, high-speed infrastructure that could be positioned with business and industry as a real-world example of what is required by a true, working production network.

Running on the network are a host of bandwidth-hungry applications. PKI works with the U.S. Air Force and Global Weather and the National Security Agency. PKI is also conducting data compression tests in large systems through such entities as the U.S. Army Corps of Engineers, U.S. Strategic

Command, The Global Innovations and Strategy Center (GISC), Federal Bureau of Investigation, Defense Information Systems Agency, Lockheed-Martin, Northrop Grumman, MITRE Corporation, Union Pacific Railroad, Kiewit Construction, Boeing, IBM, Dell, and Mutual of Omaha.

To deliver the learning opportunities that will prepare its students for the future, the PKI network must handle massive quantities of data transfer for testing and development. The network needs to be robust enough to carry one Gigabit Ethernet to the desktop and expand to 10-Gigabit Ethernet to the core when necessary.

Solution

Before PKI added Brocade® products, it had a competitor's equipment in place for about five years. Near the end of that time span it became obvious that the previous network was not keeping pace with technological advancements. After an audit of the network infrastructure, the Institute realized it needed more than an upgrade—PKI needed to go to the next level of network performance. And it needed Brocade equipment to get there. PKI wanted to ramp up its networking, and the Institute was impressed with the support and networking knowledge Brocade offered.

Instead of simply upgrading, the PKI network took a quantum leap forward with Brocade. Now, PKI's network is composed of routers and switches that have redundant cores, and it is highly secure. The PKI network consists of Brocade FastIron® SuperX™ high-performance convergence switches in the network closets. In addition, it added Brocade BigIron® RX-16 Layer 2/Layer 3 Ethernet switches to provide full system redundancy (switch, management, and power) for the growing PKI network. This combination of equipment gives PKI the five-nine's reliability and availability it required.

Results

By upgrading to the Brocade network, PKI gained a significant boost in

performance. The PKI staff and students noticed "an unmistakable difference" in performance, noted Winnie Callahan, Executive Director of The Peter Kiewit Institute. The increased performance is due in part to the BigIron RX-16 wire-speed capabilities. The switch has up to 64 wire-speed 10-Gigabit Ethernet ports and 768 wire-speed Gigabit Ethernet ports. When PKI is ready to move to 100-Gigabit Ethernet, the BigIron RX-16 will be able to support the increased performance. The FastIron SuperX adds to the network's performance capabilities with its backplane capacity of 510 Gbps, a data switching capacity of 408 Gbps, and a packet forwarding capacity of 304 Mpps.

By deploying Brocade into the network, PKI gained a number of Layer 2 capabilities including the Brocade Metro Ring Protocol (MRP) for rapid service restoration in ring-based topologies, VLAN stacking for tunneled VLAN services, and rich bandwidth management features for controlling network utilization.

PKI now operates a high-speed, easily scalable network with multiple redundancies that prevent outages and failures. The support team can easily add enhancements to the network, as PKI's network needs and educational plans change. "Brocade can clearly adapt to technical evolutions as we need them," says Callahan.

Callahan cites the responsiveness of Brocade as a major plus in the success of the network. "Brocade is always available to help us improve the network. It has been a fantastic partner," she says.

Brocade has contributed more than its technical expertise to PKI. The networking manufacturer has also become a vital resource for the institute's entire community. "Brocade provides engineers and technical people who make presentations to students, professors, and business leaders. With Brocade, the Institute gains a new, more advanced learning experience for our students and faculty," says Callahan.

While PKI has more than 200 signed partners, it considers Brocade one of its best, based on the personal attention it continues to receive from Brocade.

"Brocade brought its experience, time, and people to campus to enhance the learning environment," adds Callahan. She says the Brocade network is a natural extension of the technology and business learning environment fostered at the Institute.

PKI has always strived to be in a cutting edge, leadership position, explains Callahan. Its board of directors (11 CEOs) that work with PKI promised, planned, and dictated from its inception that the network would remain state of the art. "Bringing Brocade into the network ensures that we can meet that goal," says Callahan.

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