

Shaanxi Polytechnic Institute Pursues Smart Campus Vision with Juniper Networks

Summary

Company:

Shaanxi Polytechnic Institute

Industry:

Education

Business Challenge:

- Limited scalability and management complexity of aging campus network
- Proprietary agent-based network authentication system unable to support mobile devices

Technology Solution:

- MX960 3D Universal Edge Router
- EX4550 Ethernet Switch
- EX2200 Ethernet Switch

Business Results:

- Open standards authentication eliminates the need for agent software, enabling campus network mobile connectivity for more than 21,000 students and staff.
- Simplification of network administration reduces operating costs.
- Massive core network scalability, elimination of aggregation layer, and single Ethernet domains in core and access layers support increased data center visualization and pave the way for smart campus apps.



Shaanxi Polytechnic Institute (SXPI) is a higher education vocational college under the jurisdiction of the Shaanxi Provincial Government in China. Founded in 1950 as Xianyang Machine Manufacture School and upgraded to a college in 1999 under the approval of the Ministry of Education, SXPI is the first higher education vocational college in China that awards degrees. The university currently has about 20,000 students and a staff of about 1,070, of whom 675 are full-time teachers, including 63 professors and associate professors.

Business Challenge

SXPI's aging campus network was reaching the limits of its scale, and it was clear that a next-generation network was required to realize the vision of introducing smart applications to support teaching and learning. In addition to needing an infrastructure that could scale to meet exponential growth in demand for many years to come, the university also wanted to support subscription-based network access for smartphones and tablets that are prevalent among its student population. It is common for universities in China to collect network access fees from students, primarily to pay for their international data traffic.

"Our old campus network used an 802.1x-based agent running on PCs to provide authentication and enable accounting. However, proprietary extensions in the software locked us into the access switch vendor and there was no version of the agent to run on mobile platforms. The complex configuration and maintenance of the authentication mechanism on the access switches was, in any case, a significant admin overhead for our Network Information Center," says Su Xinglong, Director of Network and Information Center, Shaanxi Polytechnic Institute.

"While other vendors were able to provide broadband remote access servers, Juniper Networks' design was clearly better as it consolidated BNG and core network switching into a single, highly scalable and reliable platform."

Su Xinglong, Director of Network and Information Center, Shaanxi Polytechnic Institute

Technology Solution

Working closely with Hanbai Technologies, a Juniper Networks partner, as well as RADIUS-based authentication and billing system vendor Srun Software, Juniper's engineers set out to educate SXPI's Network Information Center on the benefits of using a broadband network gateway (BNG) to solve its authentication problem, eliminating

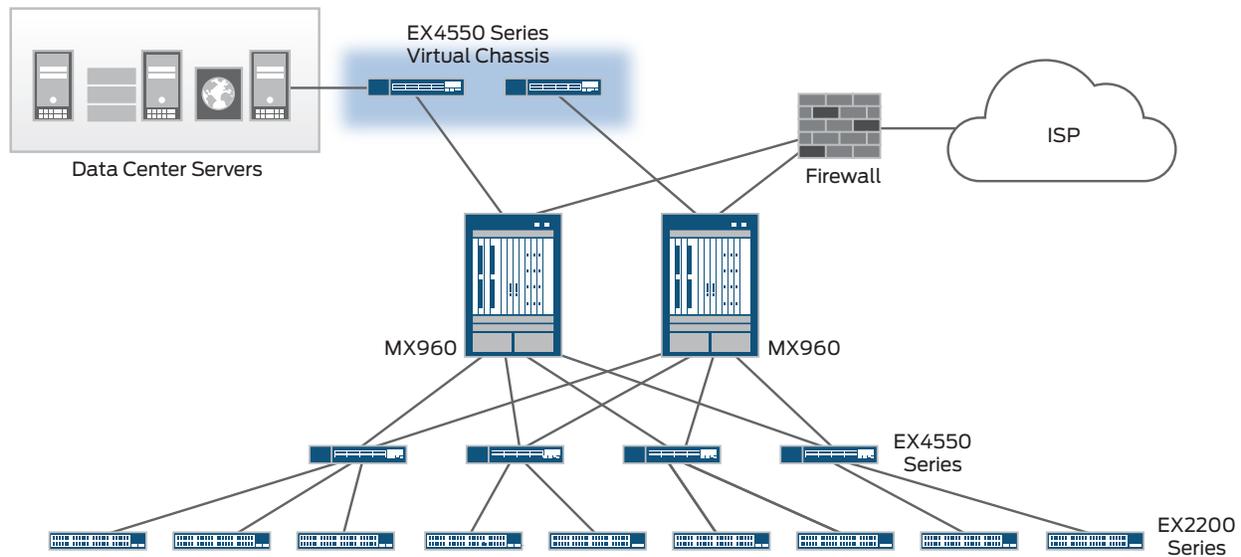


Figure 1: Juniper MX960 routers and EX4550 and EX2200 switches play a significant role in SXPI's new network.

the need to run agent software on endpoint devices. This ultimately resulted in SXPI issuing an RFP for a new campus network that included a requirement for standards-based BNG/RADIUS user authentication.

The winning proposal leverages the BNG functionality of Juniper Networks® MX960 3D Universal Edge Router and the Srun 3000 platform, which provides the RADIUS/AAA functionality needed for network subscriber management. In addition to Internet service providers, Juniper and Srun were able to cite a number of universities in China using their combined solution.

“While other vendors were able to provide broadband remote access servers, Juniper Networks’ design was clearly better as it consolidated BNG and core network switching into a single, highly scalable and reliable platform,” Su says.

MX960 routers, which are currently deployed and interconnected in an active/standby configuration, form the core layer of SXPI's new campus network, providing a high level of redundancy, 9.92 Tbps of system capacity, and support for high-density 10GbE, 40GbE, and 100GbE interfaces. With this powerful foundation in place, the university can easily meet network demand from tens of thousands of mobile devices, with massive reserve capacity to accommodate exponential network traffic growth through to the next decade.

SXPI has deployed Juniper Networks EX4550 Ethernet Switch in the campus network aggregation layer with duplex 10GbE connectivity to the core. It also deployed a high density of wire-speed ports to support Juniper Networks EX2200 Ethernet Switch, which provides wired 1GbE network access across the campus. Within the SXPI data center, EX4550 switches have also been deployed to provide high-density, high-performance server connectivity, with uplinks direct to the core switches, eliminating the need for a data center aggregation layer.

The entire Juniper Networks infrastructure at SXPI runs the same Juniper Networks Junos® operating system, enabling SXPI network administrators to orchestrate and streamline management operations across the network.

“Deployment of the Juniper Networks campus network solution is a big step forward, enabling us to build a smart campus that offers a new generation of mobile apps to staff and students. Juniper Networks’ open standards solution removes significant scale and performance constraints while reducing our operating costs, and it provides us with the agility to pursue our smart campus vision.”

Su Xinglong, Director of Network and Information Center, Shaanxi Polytechnic Institute

Business Results

Since SXPI migrated to the new campus network infrastructure, the university's more than 21,000 students and staff have been enjoying seamless authentication of their mobile devices, thanks to Juniper's BNG solution. For the Network Information Center system administrators, the elimination of agent-based authentication has brought considerable relief.

“Our network administrators used to have to deal with a lot of PC and agent-related problems as well as having to manage complex configurations across all our access switches. That is all, thankfully, a thing of the past and we now enjoy streamlined network admin across our Juniper Networks infrastructure thanks to Junos OS automation,” Su says.

An added benefit of the Juniper Networks solution is support for Point-to-Point Protocol over Ethernet (PPPoE) remote access

connection, which enables SXPI to act as an Internet service provider for its teaching staff residing in on-campus apartments. By installing a small router in their homes, staff can connect via the MX960 to SXPI's network and the Internet.

The elimination of data center aggregation switching, meanwhile, has decreased latency while further reducing the cost of interconnect and cabling and the complexity of network operations.

Next Steps

With the new campus network in place, SXPI is ready to move forward with its vision of a smart campus, leveraging the performance, scalability, and reliability of the Juniper Networks infrastructure to support student success through digital learning and a new generation of applications designed for mobile and delivered from the cloud.

Network enhancements in the pipeline include the implementation of a Virtual Chassis among the EX4550 switches in the data center, increasing data center network resiliency and providing low-latency east-west pathways between virtual servers across a single Layer 2 domain, without the need to hit the core network.

"Deployment of the Juniper Networks campus network solution is a big step forward, enabling us to build a smart campus that offers a new generation of mobile apps to staff and students," Su says. "Juniper Networks' open standards solution removes significant scale and performance constraints while reducing our operating costs, and it provides us with the agility to pursue our smart campus vision."

For More Information

To find out more about Juniper Networks products and solutions, please visit www.juniper.net.

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