WCU WEST CHESTER UNIVERSITY

WEST CHESTER UNIVERSITY ENHANCES THE STUDENT EXPERIENCE WITH AN AT-SCALE NETWORK

Summary

Company:
West Chester University

Industry:
Education

Business Challenges:
Deliver on student and faculty expectations for connectivity with fast, reliable data center and campus networks

Technology Solution:
- *MX480 5G Universal Routing Platform*
- *QFX10002 and QFX5110 Ethernet Switches*
- *EX9200 line of Ethernet switches*
- *Advisory Services and Implementation Services*

Business Results:
- *Met student and faculty expectations for on-campus digital experience*
- *Easily scaled the network using EVPN-VLAN in data center and campus networks*
- *Migrated to new data center network 4X faster than previous upgrade*

Whether aspiring poets, doctors, or rocket scientists, students expect an exceptional digital experience. Digital enhances learning, engagement, and collaboration, and it prepares students for the workplace. The increased importance of a comprehensive digital experience is quite clear to West Chester University, a public university in Pennsylvania. The university turned to Juniper Networks routing and switching to build a fast, flexible, at-scale network from data center to campus.

"Students, faculty, and staff require ubiquitous campus-wide network access which is highly available, resilient to unexpected failures, and is easily adaptable to meet their ever-growing coursework, research, and entertainment demands," says Kevin Partridge, assistant director of IT infrastructure services at West Chester University.

Located just outside of Philadelphia in suburban Chester County, West Chester University (WCU) is the largest of Pennsylvania's state universities, with 17,500 students engaged in more than 180 programs of study. WCU is tied for 17th place on the list of Top Public Schools compiled by *U.S. News & World Report*.[1]

High Expectations

As at most universities, WCU students have grown up online and expect the same levels of technology on campus as in their personal lives. Students and faculty alike need easy access to course materials, video lectures, cloud-based productivity tools, and much more. To deliver on that experience, WCU decided to refresh its network in phases.

WCU first deployed Juniper at the Internet edge, ultimately expanding Juniper networking across its data center and campus networks.

"The partnership is as important to WCU as the infrastructure," says Partridge. "We felt that Juniper would support us in any way we would need, not just at the time of the initial purchase, but all the way through the refresh cycle and in post-sales support."

The university deployed the Juniper Networks® MX480 5G Universal Routing Platform for high-performance, reliable, and adaptable connectivity to the Internet.

"We prefer standards-based protocols, and Juniper's implementation of EVPN-VXLAN is very clean."

- Shaun Spence, senior network engineer, West Chester University

[1] "Top Public Schools, Regional Universities North," Weekly News & World Report, www.usnews.com/best-colleges/rankings/regional-universities-north/top-public

Transforming the Data Center

The IT team then turned its attention to the data center. "We wanted a lean, agile architecture for the data center," says Shaun Spence, senior network engineer at WCU.

The server team was planning to migrate its traditional server and SAN-based storage environment to a new hyperconverged infrastructure, with integrated compute, storage, and virtualization technologies. This migration demanded the convergence of both storage and data networks. "We needed a network that could support both storage and data networking and be as robust as possible," Partridge says.

"With the help of Juniper Networks, our agile network architecture continues to support how students learn and faculty teach. This has supported our expansion of online learning in addition to our traditional on-campus learning."

- Kevin Partridge, assistant director of IT infrastructure services, West Chester University

The goal was to simplify and modernize the network, moving from a traditional architecture to a collapsed network for greater scale, improved resilience, and lower latency across devices. "We wanted to improve our dual data center network architecture," Spence says. "With resiliently designed Layer 2 networks, there's generally the introduction of loops, requiring the use of a protocol like spanning tree. This has its drawbacks and is very inefficient. Using EVPN and VXLAN, we were able to provide the required Layer 2 functionality for virtualized server connectivity between our data centers while efficiently utilizing a full mesh of Layer 3 links without the risk of network loops."

WCU chose the Juniper Networks QFX10002, a fixed-configuration 10/25/40/100GbE switch, for its spine-layer switches and the Juniper Networks QFX5110, a high-performance, agile 10/25/40/100GbE switch, for leaf-layer switches.

WCU uses Ethernet VPN-Virtual Extensible LAN (EVPN-VXLAN), supported in the Juniper Networks Junos® operating system, as a framework for managing its data center network. "In talking with higher ed colleagues, I was turned on to the idea of EVPN-VXLAN," says Spence. "We prefer standards-based protocols, and Juniper's implementation of EVPN-VXLAN is very clean."

An EVPN-VXLAN architecture supports efficient Layer 2/Layer 3 network connectivity with scale, simplicity, and agility, while also reducing OpEx. EVPN-VXLAN enables WCU to deploy a much larger network than is possible with traditional Layer 2 architectures. And with EVPN-VXLAN, WCU can easily add network capacity without having to redesign the network.

As Partridge explains, "EVPN-VXLAN allowed us to expand our services, such as turning up new Wi-Fi networks to support IoT or BYOD devices, in an efficient, controlled way without impacting users."

The data center network refresh was completed in less than two months—four times faster than the previous upgrade. "The ability to move from one infrastructure to another was greatly enhanced," says Partridge. "We were able to introduce new compute and storage with the underlying Juniper foundation without a massive amount of time and effort."

Building a Scalable Campus Network

With a successful migration to Juniper networking on the Internet edge and data center, WCU deployed Juniper Networks EX9214 Ethernet Switches as a programmable, flexible, and scalable foundation for its campus network core. EVPN-VXLAN plays an important role on the campus, quickly and efficiently backhauling traffic from the wireless controllers to the data centers. "Using EVPN-VXLAN is completely transparent to the wireless controllers, and we don't need to worry about broadcast storms anymore," Spence says.

Students commonly bring multiple devices—phones, laptops, tablets, gaming consoles, and wearables—to campus, and the number of IoT devices is exploding. The sharp increase in the number of devices made support for IPv6 critical. "With IoT and BYOD, we have more devices connecting to the network, and IPv6 is the answer to that," Partridge says.

"Juniper's commitment to IPv6 and IPv4 was paramount in our decision. We see higher education as a driving force for IPv6. All of our client networks, including wireless, support IPv6 and we're currently extending IPv6 connectivity into our server networks."

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Simplify Network Operations

The WCU team worked with Juniper Advisory Services and Implementation Services on the border routing and data center projects, but quickly became self-sufficient. "It was good to have Juniper's assistance," says Spence. "We had the same system engineers from the border router implementation. They helped us optimize our design."

The network team quickly acclimated to Junos OS, the single operating system that powers Juniper's portfolio of networking and security products. "Junos operating system was very simple to pick up because of my background in programming," says Spence. "Junos is second nature to me."

Ready for the Digital Generation

Technology has fundamentally transformed how college students live and learn, but Partridge is confident.

"The demand for bandwidth continues to expand, and we're able to keep up because of the investments we've made into products which are modular, can be expanded over time, and have software that's continuously improved," he says. "With the help of Juniper Networks, our agile network architecture continues to support how students learn and faculty teach. This has supported our expansion of online learning in addition to our traditional on-campus learning."

For More Information

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

About Juniper Networks

Juniper Networks brings simplicity to networking with products, solutions and services that connect the world. Through engineering innovation, we remove the constraints and complexities of networking in the cloud era to solve the toughest challenges our customers and partners face daily. At Juniper Networks, we believe that the network is a resource for sharing knowledge and human advancement that changes the world. We are committed to imagining groundbreaking ways to deliver automated, scalable and secure networks to move at the speed of business.

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