WILLIAM & MARY
CHARTERED 1693

THE COLLEGE OF WILLIAM & MARY AUTOMATES CAMPUS NETWORK REFRESH, SAVING 400 HOURS

Summary

Company:
The College of William & Mary

Industry:
Education

Business Challenges:
Refresh campus access network to meet demands of digital learning and the explosion of smart connected devices.

Technology Solution:
- *EX3400 Ethernet Switch*
- *MX960, MX240, and MX80 5G Universal Routing Platforms*
- *SRX Series Services Gateways*

Business Results:
- *Built robust network infrastructure to support round-the-clock operations of a university*
- *Connected 50,000 user and IoT devices, and prepared for ongoing increases*
- *Saved 400 hours in deployment time with automated switch configurations*

"A college is like a little town," says Courtney Carpenter, CIO of The College of William & Mary. "William & Mary has about 6,000 undergraduates, and about 5,000 of them live on campus in resident housing. Classrooms, business offices, and libraries are open during the day, and then at night, students are in their rooms. There's no downtime. You can't run a university today without a robust network." To meet the expectations of round-the-clock operations, along with an explosion of Internet of Things (IoT) devices, William & Mary refreshed its campus network with Juniper Networks solutions.

William & Mary is the second oldest university in the U.S. It's known as a "Public Ivy"—a public research university that offers world-class education at an exceptional value. It attracts bright students who come for engaging academics, hands-on research across all disciplines, and a strong tradition of community service.

The William & Mary campus has a 325-year history. Hundreds of stately, red-brick buildings and modern, LEED-certified buildings are spread across a 1,200-acre, leafy-green campus in Williamsburg, Va. The campus network connecting those buildings is essential for delivering academic content, from the learning management system to classroom video recordings. Administrative systems, from course registration to financial aid to e-mail, are essential for the everyday functioning of the university. Phone calls, broadcast television, and streaming media run over the network. In the residences, students expect great connectivity for tackling everything from Plato to Multivariate Calculus to late-night Fortnite battles.

"Students and professors come to campus expecting that all of their devices work. They just expect the network to work. And with Juniper, it does."

- Courtney Carpenter, CIO, The College of William & Mary

Serving a Digital Generation

Students, professors, and administrators overwhelmingly prefer to connect via Wi-Fi, making the role of the campus wired network even more important. Access switches connect wireless access points, VoIP phones, and a fast-growing number of IoT devices. The campus network supports 50,000 devices.

"These days, the network has a myriad of devices like environmental controls, fire alarms, and door locks," says Carpenter. "Our new buildings have Power over Ethernet (PoE) clocks, so the time is always right."

Smart, connected laundry rooms mean students can see which washers and dryers are available—and they can track when their clothes are fluffy and dry. Vending machines are wired, so students can buy a soda by swiping the same card they use for their meal plan and laundry—and to open the door to their residence hall.

"It's crazy what's going on with the network these days," Carpenter says. "The whole Internet of Things is exploding."

"Junos OS has a rich API, and we've developed tools to make it easy to push out changes. Automation saved us 400 hours of configuration time."

- Norman Elton, network engineer, The College of William & Mary

A Robust Infrastructure Is Critical

Keeping up with the digital demands of learning, student and faculty expectations for great connectivity, and the growth of IoT devices demands a robust infrastructure. William & Mary, a Juniper Networks customer for more than a decade, decided to refresh its campus network.

"Uptime is critical," says network engineer Scott Fenstermacher. "As network people, we like to maintain a quality of life balance. We don't like to come in nights and weekends. Juniper delivers the reliability we need."

William & Mary upgraded its campus network to the Juniper Networks® EX3400 Ethernet Switch, which is designed for highly demanding data, voice, and video enterprise access environments. A compact switch, the EX3400 offers performance and management that is typical of high-end switches. Beyond speed and reliability, another major appeal was dual power supplies. "Dual power supplies are critical to keeping the systems up and running," says Fenstermacher.

The university also uses the Juniper Networks MX Series 5G Universal Routing Platforms and the Juniper Networks SRX Series Services Gateways for its core and distribution networks and for firewall services.

The switches, routers, and firewalls all run the same Juniper Networks Junos® operating system, which spans the entire Juniper product portfolio. Built with reliability, security, and flexibility at its core, Junos OS provides an operational advantage, while its automation capabilities streamline network operations and ensure operational efficiency.

"The Junos operating system initially piqued our interest in Juniper," says network engineer Clarke Morledge. "Several

people on the network team have programming backgrounds, and Junos OS seemed a very sensible way to build an operating system for a network."

"We have a relatively small team who manage the gear, compared to the size of the network," says Morledge. "We have to make sure that things can scale properly. Junos OS really fits the bill for scalability."

Automated Network Deployment

William & Mary's network team took advantage of the programmability of Junos OS to simplify the campus refresh. "Junos OS has a rich API, and we've developed tools to make it easy to push out changes," says network engineer Norman Elton. "Automation saved us 400 hours of configuration time."

The team needed to configure and deploy more than 800 EX3400 switches in just a few weeks. "The field team deployed batches of switches in the hour before classes started," says Carpenter. The field team just opened the boxes and racked the switches. "We could only do that level of automated configuration with Juniper," he says. "It isn't possible with other vendors."

Automated configuration and validation sped up the process and eliminated frustrating manual errors. "We were basically hands-off for the rest of the day, so we could get ready for the next day's batch," says Elton.

Network automation will lighten the ongoing workload for the network team. "If we want to roll out a new feature, we can test it on a couple of switches, and then hit 'go' and the change is automatically rolled out," Elton says. "We can make a change in the middle of the day, because the way Junos OS works is you can make changes without rebooting the switch."

"We could only do that level of automated configuration with Juniper. It isn't possible with other vendors."

Courtney Carpenter, CIO, The College of William & Mary

A Multicloud Reality

The University has hundreds of applications and services in the cloud and is moving more platform services to Amazon Web Services and Azure. "We have a cloud-first strategy for anything new," says Carpenter.

The embrace of multiple cloud platforms makes the MX Series platform providing edge routing even more critical. A highly redundant core and edge design, coupled with the carrier-class reliability of the MX Series routers, ensures that users have ready access to their cloud resources.

"As more and more applications and services move to the cloud, there's a greater emphasis on making sure that Internet connectivity stays up and going all the time," Carpenter says.

Ready for Future Growth

A lot has changed since Thomas Jefferson read law at William & Mary.

"Data demands have been growing linearly for the past 10 or 15 years," says Morledge.

William & Mary's new campus network easily weathers the spike when a new episode of Game of Thrones is released or when students rush to register for classes.

With the access switching upgraded, the team is planning to upgrade from a 10GbE core infrastructure to 40GbE. "We're planning for the future, and with our EX Series switches, we can easily convert 1 gig uplinks to 10 gig where we see greater demand for bandwidth," Morledge says. "Our investment is protected."

"Students and professors come to campus expecting that all of their devices work," says Carpenter. "They just expect the network to work. And with Juniper, it does."

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.

BLACK BOX

855-324-9909 | BLACKBOX.COM

Corporate and Sales Headquarters

Juniper Networks, Inc.

1133 Innovation Way

Sunnyvale, CA 94089 USA

Phone: 888.JUNIPER (888.586.4737)

or +1.408.745.2000

Fax: +1.408.745.2100

www.juniper.net

APAC and EMEA Headquarters

Juniper Networks International B.V.

Boeing Avenue 240

1119 PZ Schiphol-Rijk

Amsterdam, The Netherlands

Phone: +31.0.207.125.700

Fax: +31.0.207.125.701

JUNIPER NETWORKS | Engineering Simplicity

EXPLORE JUNIPER Get the App.

JUNIPER 1ON1

Available on the App Store

ANDROID APP ON Google Play