



DARTMOUTH TRANSFORMS THE CAMPUS EXPERIENCE WITH AI-DRIVEN INSIGHT AND AUTOMATION

Summary

Company:

Dartmouth College

Industry:

Education

Business Challenges:

Provide an amazing campus Wi-Fi experience to students, faculty, and administration.

Technology Solution:

- Mist Platform
- QFX10002 Switch
- EX3400 Ethernet Switch

Business Results:

- Dramatically increased student and faculty satisfaction with scalable, flexible campus network
- Gained new visibility into the Wi-Fi user experience and root causes of issues
- Empowered college to predict problems before they arise
- Leveraged AI and automation to speed deployment

Dartmouth College has long been known as one of the world’s greatest academic institutions. The Ivy League university, located in Hanover, NH, is the ninth oldest higher education institution in the United States, and it attracts a diverse, highly motivated student and faculty population. More than 6500 undergraduate and graduate students attend Dartmouth, and the school employs a distinguished faculty and staff of around 4000 individuals. The college is transforming its networking experience with the Mist Platform and Juniper Networks switching.

Great Wi-Fi Is Part of the College Experience

When Mitch Davis joined Dartmouth College two years ago as CIO, he wanted to better align IT initiatives with the university’s mission and strategic plan. Davis calls it “ICT 2.0” for the information, consulting, and technology that will keep the college on the leading edge of technology.

Wi-Fi is a top priority. Students expect fast, pervasive, reliable wireless service just as much as an engaging curriculum, good professors, and a vibrant social life. But digital generation had pushed Dartmouth’s campus network to capacity. With 25,000 devices connected and counting, Dartmouth had witnessed a six-fold increase in mobile devices in the last several years. As a result, Wi-Fi was mediocre, especially in historic buildings and large lecture halls.

“We are well over 90 percent residential, so students expect to have full access to the learning management system or classroom technologies,” says Felix Windt, director of networking at Dartmouth. “They expect the network to just work, not just in the dorm but anywhere they’re meeting.”

To reach its goal, the IT team needed to break free from the status quo. Davis set out to offer a best-in-class Wi-Fi experience to students, faculty, and administrative staff. And that meant a complete network refresh, from the fiber to the access points.

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- Mitch Davis, CIO, Dartmouth

Teamed Up for Best Campus Network

Dartmouth chose the AI-powered WLAN solution from Mist, a Juniper Company, and Juniper switching for its campus wireless and wired network. The university's technical team was pleased to see Juniper and Mist come together in 2019. "We began working with Mist and Juniper before the acquisition," says Davis. "We saw the synergy."

Mist is a truly innovative wireless platform. Built with a modern microservices cloud architecture, Mist delivers scale and agility, with AI-driven automation and insight.

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"What attracted me to Juniper was automation," Windt says. "Juniper calls it network reliability engineering or taking an engineering approach to measure and automate the reliability of the network."

The Mist Platform deployment started in the Tuck School of Business and the Thayer School of Engineering, with plans to eventually roll the new Wi-Fi out to all 200 buildings on campus. Mist provides high-performance 802.11ax and 802.11ac Wi-Fi, Bluetooth LE, and IoT.

"I have deployed several generations of campus networks," Windt says. "The deployment of Mist and Juniper is the fastest and most resource-efficient way because of automation and AI."

Windt developed automation tools to speed deployment. "If you shave one hour off the installation of 2000 access points, that's the equivalent of a full-time employee for a year. That's time we can use to serve customers instead of screwing access points into the ceilings."

An Evolved Campus Network

A state-of-the-art wired network from Juniper provides the foundation for an exceptional user experience. "Juniper makes a workflow-driven approach to automation easy with its APIs," Windt says. "We can treat the entire network as infrastructure-as-code."

Dartmouth's campus network uses an Ethernet VPN-Virtual Extensible LAN (EVPN-VXLAN) architecture to deliver Layer 2/ Layer 3 connectivity with greater scale and efficiency. EVPN-VXLAN decouples the underlay network (physical topology) from the overlay network (virtual topology), delivering greater flexibility. "By transforming our network from a simple Layer 2/ Layer 3 network to EVPN, we can significantly increase security zones on campus," Windt says. "Now we can inspect east-west traffic, instead of just at the border."

Juniper Networks® QFX10002 Switch is used in the core network and Juniper Networks EX3400 Ethernet Switch provides cost-effective access networking. Designed for simplicity, Junos® operating system powers all Juniper networking and security. The network is built for reliability and security and automates network operations.

"I like Juniper, from top to bottom, from edge to core, because I work with one operating system," Davis says. "I know Juniper can provide support across the whole spectrum, including security."

Students Turn In Rave Reviews

With a Juniper- and Mist-powered network, everyone at Dartmouth is experiencing positive change. The 5 GHz Wi-Fi network, designed for today's high-density mobile environments, lets students easily access the learning management system, collaborate on business presentations, or run engineering simulations. Professors can use their iPads for visual aids in the classroom, and administrative staff have ready access to the resources they need to do their jobs.

Mist includes Marvis, a Siri-like virtual network assistant, that uses natural language processing to provide IT staff with answers to questions such as "How are the access points in Goldstein Hall performing?"

Network operations are also simplified, freeing up IT for more strategic projects. With Mist Wi-Fi, the IT team has newfound visibility into the user experience, including the ability to track Wi-Fi and application usage. For the first time, IT can establish, measure, and enforce defined service levels. For instance, if someone takes more than two seconds to join the library Wi-Fi network, the service desk knows right away—and knows whether it was the device or some specific part of the network that failed. Armed with this information, support staff can solve more connectivity issues on their own, without escalating to the network services team.

Even better, the Mist Platform anticipates performance issues before they occur, adding an unprecedented self-healing quality to the network.

A Journey to AI-Driven Networking

The industry is just beginning its journey to AI-driven IT, and Dartmouth is on the forefront. "AI will change how the network is managed," Davis says. "We believe AI can be used to take over a lot of the manual work. But first, we are learning how to speak AI, and then we can deploy where it will have the most value."

"We're in the early days," Windt says. "My car can tell me that another car is next to me, so I don't do a lane change at that moment. We're getting on the road to the self-driving network."

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Poised for More Digital Transformation

Looking ahead, Dartmouth is exploring the possibilities of location-based services. With beacons and Bluetooth Low Energy built into the Mist Platform, the college can provide visitors with turn-by-turn directions to their destinations, automate attendance taking in classrooms, or offer augmented-reality museum tours. With a strong network foundation, Davis and team know the campus is fully prepared for a future of exciting innovations that will keep Dartmouth among the digital elite.

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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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