

ROADMAP TO AUTOMATE CAMPUS NETWORK OPERATIONS IN HIGHER EDUCATION

Deliver optimized wireless and wired user experiences and simplify IT operations

Challenges

Institutions of higher learning frequently suffer with inconsistent network user service experiences, a lack of visibility across both wireless and wired networks, and time-consuming wired and wireless management solutions.

Solution

Juniper's AI-driven Mist Platform and wireless access points, Wi-Fi Assurance, Wired Assurance, Marvis Virtual Network Assistant, and EX Series Ethernet campus core and access switches deliver an on campus and university at home solution that extends AI-driven networking to remote and hybrid learning.

Benefits

- Deliver optimized experiences with great connectivity
- Support hybrid and remote learning with scalable, secure home access
- Enable contact tracing and other health and safety initiatives on campus
- Simplify network troubleshooting and operations with AI and automation
- Protect sensitive data with a threat-aware network

As higher education continues to advance knowledge and innovation, and prepare our next generation of talent for the world, the campus network needs to be more adaptable, secure, and operationally efficient than ever. The campus network needs to support the demands of in-person and remote learning as well as new uses like contact tracing and wayfinding. Juniper Networks solutions for wired and wireless access can deliver the AI-driven automation and flexibility to meet these needs.

The Challenge

Students, faculty, and staff at institutions of higher learning expect great connectivity to the university network, whether on campus or at home. The use of online collaboration, with more video and chat messages, is surging. Cloud applications and remote learning have changed the typical traffic patterns across the campus network. Wi-Fi 6 mobile devices pump out far more traffic than their predecessors. Institutions need to ensure that network capacity is always sufficient, whether students access applications from a lecture hall, dorm room, or home.

Institutions are looking to IoT and smart campus technologies to support health and safety requirements and make the campus welcoming and sustainable. Location services make it easier for visitors to find their way across large campuses—or alert them to spread out if an area gets too crowded. Infrared sensors can identify people with elevated temperatures. If someone reports having an infectious disease, contact tracing can slow the spread. But IoT devices can be vulnerable to compromise, which can quickly spread across the campus network.

Running lean has always been a priority for IT teams, but the operational efficiency mandate is magnified today. There's plenty of room for improvement; most networks are managed manually, and moving into the era of AI and cloud can relieve much of that technical burden. Automation enables IT leaders to improve network service quality and efficiency. In fact, 96 percent of organizations that have automated more than half their network are exceeding their goals for network product or service quality, according to [Juniper](#) research.

The Juniper Solution—Build an AI-Enabled Campus

By applying the power of the AI-powered Mist Cloud across the campus network, Juniper Networks enables universities and colleges to deliver exceptional user and device experiences with performance, reliability, and operational simplicity.

Deliver Optimized Network Service Experiences

Mist is built on a modern microservices cloud architecture with an AI engine directly integrated into the platform. Mist, a Juniper company, delivers an optimized network experience with unprecedented insight and automation. With Mist's scale, agility, and automation capabilities, institutions save time and money from the first deployment through ongoing operations. Connectivity, troubleshooting, analytics, and engagement are easily added on as subscription services.

Marvis, an AI-driven virtual network assistant, simplifies everyday troubleshooting and network performance analysis. Helpdesk staff and network administrators can ask questions like "Why can't Lily get connected?" and get intuitive answers on a par with a wireless expert. Network support staff—and even student interns—are empowered to solve more problems without escalation. Marvis can perform self-driving actions or operate in a "driver-assist" mode to proactively identify network issues that require action from an administrator.

Wi-Fi Assurance, driven by Mist's machine learning, replaces manual troubleshooting with automated operations. Mist Wi-Fi is predictable, reliable, and measurable across campus. IT can track service-level thresholds for key metrics, such as time to connect, capacity, coverage, and throughput. When an anomaly occurs, packets are automatically captured for event correlation and visibility into the user experience.

Support Remote Teaching and Learning

IT leaders must consider both the on-campus and remote experience. Many professors and students find that their home Wi-Fi isn't up to the challenge of video instruction and remote collaboration. And connectivity isn't necessarily secured according to the university's standards.

With the Juniper Networks University at Home solution, which combines Mist Wi-Fi and Mist Edge with Juniper Connected Security, institutions can extend the network into faculty, staff, and student homes to provide great connectivity and security. IT can easily deploy managed network equipment using zero-touch provisioning (ZTP) and without the need for site visits. IT has clear visibility into the user experience at home. The hassles of VPN clients are eliminated, while university security policies are enforced no matter where the user is located.

Ultra-Reliable, Secure Wired Networking

Juniper Networks® EX Series Ethernet Switches are designed to deliver the highest levels of performance and reliability for the campus network. A broad portfolio of EX Series switches enables institutions to choose the best-fit solution for campus core, aggregation, and access switching while protecting network investments.

The EX9200 line of Ethernet switches is ideal for high-density campus core environments, while the Juniper Networks EX4600 Ethernet Switches deliver 100GbE aggregation for campus deployments. Institutions can choose from a variety of EX Series switches designed for access, including the Juniper Networks EX4300 Multigigabit Ethernet Switch, for the higher power needs of IP phones, wireless access points, and surveillance cameras.

Juniper Networks EX2300 Ethernet Switch and EX3400 Ethernet Switch deliver campus network access and are already prepared for the increased speed and power requirements of Wi-Fi 6. When Juniper Security Intelligence (SecIntel) is extended to EX Series switches, organizations can block infected hosts at the switch port, simply and easily, stopping the spread of threats.

Wired Assurance extends the power of AI operations to EX Series switches. Wired Assurance leverages rich Junos® operating system switch telemetry to simplify operations, shorten repair times, and improve visibility into end-user experiences for connected devices, including access points, servers, and IoT endpoints.

Support Health and Safety on Campus

Many universities leverage location services to provide directions on campus, conduct self-guided tours to prospective students, or locate a classroom. Mist simplifies location services with virtual Bluetooth Low Energy (vBLE) in every access point.

Mist can be used to support contact tracing if someone self-reports being infected with coronavirus. Proximity sensors can alert people to spread out when an area becomes too crowded. Mist also can be integrated with learning management systems to automate attendance. Mist analytics can be used to reveal heavily trafficked buildings or locations around campus so that administrators can ensure that students are safely distanced.

Protect Sensitive Data with a Threat-Aware Network

Cyberattacks increased 400 percent in the first quarter of 2020, according to the FBI. Higher education's open, collaborative culture, combined with lucrative research data, students' pristine credit ratings, and parents' bank accounts have always been strong lures for bad actors.

Juniper Connected Security provides built-in defenses that automatically protect users, applications, and data anywhere and everywhere across the institution. Juniper Connected Security unifies all network elements into a threat-aware network and enables security policies to be dynamically enforced across every point of connection.

Juniper's sophisticated threat detection and analysis protects against threats ranging from cybercrime, botnets, machine learning, and hacktivism. Policies are set centrally, ensuring accuracy and consistency even in a highly distributed

environment. Those policies are enforced everywhere, with any physical or virtual machine on the network used as an enforcement point, including Juniper switches, firewalls, and routers as well as third-party infrastructure and cloud platforms.

Automate to Streamline Network Operations

Automation is an imperative. Junos OS works the same way across Juniper routers, switches, and firewalls throughout the network. You can qualify and integrate once and deploy and automate everywhere.

An end-to-end Ethernet VPN (EVPN)-Virtual Extensible LAN (VXLAN) architecture gives you the ability to manage your campus and data center as a single IP fabric, with efficient Layer 2/Layer 3 connectivity, simplicity, and agility. Whether you're taking your first steps or well on your way, Juniper delivers the tools you need to go from automatable to automated, including free assisted learning, formal training, learning labs, online community, and professional services.

With Juniper, IT can leverage automation to simplify operations and decision-making through proactive planning, predictive diagnostics, actionable insights, and rapid remediation.

Summary—Deliver Better User Experiences and Simplify Operations with an AI-Driven Campus

Don't take our word for it. Ask our customers. Dartmouth transformed its network service experience with the Mist Platform and Juniper switching. "We are trying to create the best customer experience we can," says Mitch Davis, CIO of Dartmouth. "Mist allows us, through its analytics, to find out where our problems are, even if only two percent are having a problem, and resolve it on the fly. With Mist, we can create that experience for the customer."

Ask the analysts, too. Juniper Mist AI was named a Leader in the 2020 Gartner Magic Quadrant for Wired and Wireless LAN Access Infrastructure.¹

With the power of the AI-driven campus, universities and colleges can deliver optimized network experiences while streamlining network operations, freeing up IT resources for innovation.

To learn more, please contact your Juniper account manager or solution provider.

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.

¹<https://www.juniper.net/us/en/forms/gartner-mq-wired-wireless/>, Bill Menezes, Christian Canales, Tim Zimmerman, Mike Toussaint, 4 November 2020.

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