# ADVANCING K-12 LEARNING FOR THE NEXT DECADE WITH AI-DRIVEN NETWORKING

*Building the foundation for digital learning*

### Challenge

*How to deliver digital learning across traditional, remote, or hybrid instructional models, while protecting against cybersecurity threats.*

### Solution

*Juniper AI-Driven Enterprise solutions help school districts deliver faster, more reliable broadband and Wi-Fi connections, more effective cyberthreat protection, and valuable location and engagement services.*

- *EX Series Switches*
- *High-Performance Access Points*
- *SRX Series Firewalls*
- *Wi-Fi Assurance*
- *Wired Assurance*
- *WAN Assurance*
- *Marvis Virtual Network Assistant*
- *Juniper Care Services*
- *Session Smart Routers*
- *Access Assurance*

### Benefits

- *Replace manual troubleshooting tasks with automated operations for best-in-class network experiences*
- *Simplify and troubleshoot network operations with self-driving actions that improve the overall connectivity experience for students, teachers, and staff*
- *Save time and money with AI-driven operations*
- *Deliver learning experiences that students need, and educators, administrators, and staff demand*

Solution Brief

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*Digital learning and content; cloud-based applications and services; 1:1 expansion; BYOD; online assessments and classes; virtual schools—all are critical K-12 education initiatives that signal an era of unprecedented technology integration, delivering on the promise of enhanced student engagement and improved student outcomes.*

## The Challenge

School district networks are mission-critical, supporting digital learning during sessions and well past the last school bell. Network slowdowns or downtimes impact the delivery of instruction, student learning, and high-stake online assessments, as well as reduce situational awareness required for campus safety. Maintaining network and security systems that meet the demands of educators, administrators, students, and staff poses challenges.

Budgets and IT resources are often at their limit and unable to keep up. The adoption of new digital technologies and cloud-based services, along with the increased number of learning devices, including those brought into the classroom by students and teachers, has added further strain and complexity to network requirements and management.

## The Juniper Mist AI-Driven Digital Learning Network Solution

Juniper® AI-Driven Enterprise, driven by Mist AI™, addresses the issues school districts face, providing them a network for the next decade. By proactively delivering predictable, reliable, and measurable wired and Wi-Fi network services, Juniper helps school districts save time and money, maximize IT productivity, and deliver great digital learning experiences that students need, and educators, staff, and administrators demand.
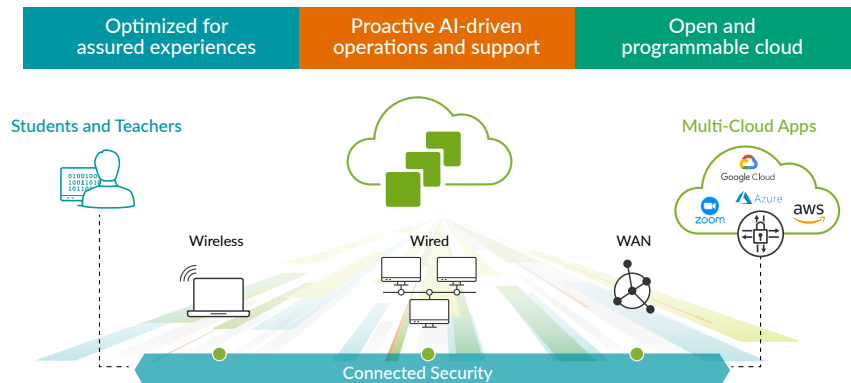


*Figure 1. AI-driven digital learning network architecture*

## Features and Benefits

School districts across the country put their trust in Juniper to:

- Maximize learning outcomes with a great user experience: Juniper is the first and only solution to offer and measure the experience of every user, every minute, every session to proactively make it better for all.

- Futureproof the network: Juniper is the only network provider offering frequent feature updates, all with no downtime or any of the complexities typically required to upgrade controllers and access points.

- Simplify troubleshooting: Marvis™ Virtual Network Assistant can do the heavy work of troubleshooting and locating problems quickly, so IT can solve issues fast and stay ahead of trouble. Also, Juniper's unique, patented dynamic packet capture technology automatically captures packets when an issue occurs, eliminating trips to the classroom for packet captures.

- Improve IT productivity: Juniper offers the only AI-driven wired, wireless, and WAN network on a single pane of glass, providing end-to-end visibility and streamlined operations.

- Set up personal Wi-Fi space for teachers and learners, while enabling security at scale: The same service set identifier (SSID) can be used to establish a personal space or Wi-Fi bubble for educators, select users, or select IoT devices. This unique capability gives educators control over their classroom Wi-Fi environment.

- Enable self-driving operations: Being AI-driven, the Juniper solution proactively identifies network issues, helping districts maintain a great user experience and reduce the number of support help tickets typically associated with traditional school networks. Autoprovisioning for Juniper switches and access points accelerates provisioning. Any device or client connected is automatically detected, and auto port configuration is automatically made, eliminating human errors.

- Enhance digital experience with location-based services: Juniper access points have integrated, patented Bluetooth antenna arrays. When your district is ready, location-based services can be simply turned on with optional software subscriptions. With this approach, districts avoid deploying separate battery-operated beacons, beacon calibration, and overlay appliances.

- Lower TCO: School districts with Juniper experience the fastest network deployment, fewest trouble tickets, fastest mean time to repair, and easiest operations to reduce the network's TCO.

## Solution Components

Many districts have deployed Juniper building blocks to create the network of the next decade. These building blocks are described in Table 1.

Table 1: Juniper AI-Driven Enterprise Portfolio

| Juniper Mist AI and Cloud Services |
| --- |
| **Mist AI and Cloud Family of Services**: District network administrators save time and money with faster problem resolution and fewer onsite campus visits. Educators, students, and staff benefit from a network infrastructure that is more predictable, reliable, and measurable. Mist AI uses a combination of artificial intelligence, machine learning, and data science techniques to optimize user experiences and simplify operations across the wireless access, wired access, and SD-WAN domains. Key capabilities include automated event correlation, root cause identification, Self-Driving Network™ operations, network assurance, and proactive anomaly detection. Additionally available are:<br><br>**Marvis Virtual Network Assistant**, the first virtual network assistant that is purpose-built with Mist AI for enterprise WLANs, LANs, and WANs. It fundamentally transforms network operations from reactive troubleshooting to proactive remediation through self-driving actions.<br><br>**Juniper Mist Access Assurance** cloud service delivers zero-trust, identity-based network access control in a flexible yet simple policy framework for onboarding guest, IoT, BYOD, and corporate devices. Juniper **Mist Premium Analytics**, **User Engagement**, **Asset Visibility**, and **IoT Assurance**. |

| Network Switches |
| --- |
| **Juniper Networks® EX Series Switches**: Designed for the converged school district campus and data center to address demands for high availability, unified communications, and virtualization, EX Series switches are cloud-ready, and they offer high-performance, scalable, fixed-configuration 1GbE, and multigigabit platforms. The fixed configuration 10GbE aggregation switches are ideal for high-density campus deployments, and the modular core switches are optimized for high-density, mission-critical applications. With the EX Series, wired access networks don't have to be complex and difficult to manage. Network administrators can easily onboard, configure, and manage the switches and operate campus fabrics at scale with Juniper Mist Cloud. When the EX Series is combined with the Juniper Wi-Fi portfolio for a unified wired and wireless solution, driven by Mist AI, school districts gain simple and secure connectivity at scale. Juniper solutions reduce network complexities while addressing scalability by managing multiple devices as one. School districts can design end-to-end campus fabric architectures using Virtual Chassis technology or open, standards-based Ethernet VPN–Virtual Extensible LAN (EVPN-VXLAN) to avoid costly rip-and-replace upgrades. |

**Juniper Networks QFX Series Switches:** QFX Series Switches, ideally suited for district traffic aggregation points and data centers, improve the efficiency of district fiber networks by aggregating traffic for WAN and Internet access transport. The QFX5100 line of Switches consists of scalable Layer 2/Layer 3 switches that are optimized for application delivery and contain a powerful feature set for virtualized data centers. The QFX10000 line of Switches offers a highly scalable, high-density network foundation for supporting today's most demanding data center and cloud environments, including midsize to large data centers, private clouds, and public clouds.

## Wireless Access Points

**Juniper Series of High-Performance Access Points**: Designed for the demands of digital learning, Juniper makes Wi-Fi predictable, reliable, and measurable by providing unprecedented visibility into the user experience. Wi-Fi, Bluetooth Low Energy (BLE), and IoT are merged with our enterprise-grade access points. They work in conjunction with the Juniper Mist Cloud architecture and Mist AI so school districts can easily customize Wi-Fi service levels, easily provide guest services, quickly identify compliant and noncompliant devices for assessment readiness, replace frustrating, time-consuming manual IT tasks with proactive automation, gain insights through detailed analytics, and leverage location-based services to support functions such as contact tracing and locating valuable assets.

## Routers

**Juniper Networks MX Series Universal Routing Platforms**: The Juniper portfolio of high-performance, software-centric physical and virtual routers delivers all of the performance, features, and functionality school district applications need, including private WAN for multisite connectivity through a private backbone; data center interconnect for connecting multiple data centers for disaster recovery; geo clustering and virtualization; and Internet edge to act as the school district's Internet gateway.

The **Juniper Session Smart™ Router** takes software-defined routing and SD-WAN to a new level. It creates an application-aware network fabric that meets the most stringent enterprise performance, security, and availability requirements. Deploy it as software on customer premises equipment (CPE), on data center network servers, and in the cloud. An appliance version for branch sites offers multiple WAN link options, including 4G/LTE and 5G.

## Security

**Juniper Networks SRX Series Firewalls**: SRX Series Firewalls are rightsized for multiple district applications. These next-generation firewalls reduce risk of attack and safeguard users, applications, and devices through identity-based policies, microsegmentation, VPN connectivity, and validated threat prevention. SRX Series Firewalls also help districts achieve compliance certification for the Children's Internet Protection Act (CIPA) and the Family Educational Rights and Privacy Act (FERPA).

## Maintenance

**Juniper Care Services**: This comprehensive and flexible portfolio of support services delivers mission-critical support for Juniper hardware and software products around the clock, 365 days a year. Tailored offerings help keep your network running reliably, reduce network risk, decrease operational costs, and protect network investment.

## Summary—Powering the Digital Learning Environment for the Next Decade and Beyond

Traditional school district networks are built on antiquated architectures that lack the scale, reliability, and agility needed to address today's and future digital learning needs. Juniper solutions, driven by Mist AI, are revolutionizing networks with AI-driven automation and actionable insights, as well as the agility and elasticity of a microservices cloud. Mist AI applies artificial intelligence and data science tools to deliver optimized end-user experiences and simplified network operations, while delivering innovative and strategic projects with IoT and location services.

Juniper's wired and wireless access solutions include the EX Series Switches, SRX Series Firewalls, Juniper Access Points, and Juniper Mist Cloud services. The Juniper Connected Security solution uniquely protects your district, unifying all your network elements into a threat-aware network, dynamically enforcing security policies across every point of connection. In addition, Juniper helps schools with their E-Rate projects by providing a full suite of E-Rate eligible services to enable affordable broadband connections. As an integrated solution, Juniper helps educators create the digital learning environment they need to ensure high-level learning and student success.

Real Results, Real Experiences.

## Testimonials

**COPPELL ISD**
*you matter*

*"Before Mist, our network engineers were always chasing ghosts in the wireless. Now, Mist provides visibility so we can see what the issue is. Mist is tremendous for troubleshooting."*

**Stephen McGilvray**, Executive Director of Technology

**Wadsworth City Schools**

*"Wireless needs to be like the lights, always on and always perfect. That's how our Mist Wi-Fi is."*

**Phil Luthman**, Director of Technology

**NUES**

*"Juniper Mist simplifies the complexity of networking for the schools' IT directors, who already have so much to worry about. Mist AI takes the burden off so they can focus on where they're really needed."*

**Mark Houtz**, Network engineer, Northeastern Utah Educational Services

## Next Steps

- Read how **Newport News, Virginia** school district serves 27,000 students with AI-driven Wi-Fi.
- Find out how **Sallie B. Howard School of Arts and Science** relies on Juniper wired and wireless network, driven by Mist AI for its schools to support student achievement.
- If you need a network to support your digital learning objectives for the next decade, look to Juniper Networks. For more information, please visit **www.juniper.net/K-12/**.

## About Juniper Networks

At Juniper Networks, we are dedicated to dramatically simplifying network operations and driving superior experiences for end users. Our solutions deliver industry-leading insight, automation, security and AI to drive real business results. We believe that powering connections will bring us closer together while empowering us all to solve the world's greatest challenges of well-being, sustainability and equality.

**JUNIPER** NETWORKS® | **Driven by Experience**™