TOP **5**

Reasons Why Juniper Networks Is a Better Choice for School Districts and E-Rate Applicants

Introduction

With the goal of enhancing student engagement and improving student outcomes, U.S. K-12 Education is in a period of unprecedented technology transformation and integration. The availability of digital content, affordable mobile devices, and new cloud-based educational applications and services is enabling the shift to digital learning to spur greater student engagement, giving way to an explosive appetite for:

1) Higher speed connections to the Internet and over the schools, wide area network

2) High-performance and robust internal school district networks

3) High-density wireless in classrooms

With this shift, school districts are demanding scalable, high-performance, mission-critical network infrastructure for delivering instruction, learning, and online assessments, because in the era of digital learning, sub-par performance and failure-prone networks are not acceptable. That is where Juniper Networks' expertise and strength as a carrier-grade network infrastructure supplier comes in. K-12 school districts can now reap the benefits of Juniper's carrier-class networking solutions through the help and capabilities of Juniper Partners.

In addition, with the E-Rate Modernization Order that went into effect starting in Funding Year 2015, E-Rate applicants are now bound by their E-Rate Category Two five-year budget. This pre-discount 5-year budget is set at the individual school level, determined by multiplying the number of students by $150/student. This is then totaled to come up with a school districtwide 5-year budget. Applicants can apply the discounted amount of this budget to E-Rate Category Two eligible services and once it is consumed, the applicant will not receive additional support until the next 5-year window.

This methodology to calculate an applicant's Category Two five-year budget has major implications. So as to minimize the school's or school district's out-of-pocket costs, applicants are more careful than ever about developing and selecting a solution that is right for their 5-year infrastructure modernization plan, one that maximizes their benefits using their E-Rate funds.

This being said, a school district's 5-year modernization plan must provide for a network that:

1) Scales broadband connection capacity to meet the short and long term digital learning broadband connectivity targets,

2) Brings high-performance, high-density broadband connections into classroom with next-generation Wi-Fi

3) Cloud-enables and secures the school district as digital learning will drive greater dependency for cloud-based applications and services

4) Is more agile to quickly turn up and scale up future services without wasteful prebuilding for these capabilities

5) Minimizes their total costs of ownership over the period, minimizing out-of-pocket costs

It is clear that in the era of digital learning, traditional network designs are no longer adequate. A new education network that is designed smarter is needed. This is where Juniper Networks offers a better approach and choice.

Top 5 Reasons Why Juniper Networks Is a Better Choice for School Districts and E-Rate Applicants

Given the growing number of school districts making the move to digital learning, more and more are adopting Juniper Networks. Forward looking school districts should look to the following top five reasons as to why Juniper offers the superior option for school district network modernization projects.

Top 5 Reasons

1) Juniper builds scalable networks to support short and long term digital learning broadband connectivity targets.

2) Juniper Networks Unite modernizes and simplifies school networks into a cloud-enabled digital learning services platform.

3) Juniper secures school district networks and helps protect privacy and security of student data.

4) Juniper enables integration of best-in-class next-generation 802.11ac wireless for classroom Wi-Fi.

5) School districts build more network, with higher performance, for less money from Juniper Networks.

Juniper by the Numbers

· The world's top five social media properties are supported by Juniper Networks.

· The top 10 telecom companies in the world run on Juniper Networks.

· 9 of the top 12 largest global financial exchanges run on Juniper Networks.

· Juniper Networks is deployed in more than 1,400 national government organizations around the world.

· 7 of the top 11 best global universities run on Juniper Networks.

Reason 1: Juniper builds scalable networks to support short and long term digital learning broadband connectivity targets

With 68% of districts not believing they have sufficient Internet connectivity and 56% of districts not believing they have enough WAN connectivity for the next 18 months[1], there will be a major industry focus to address this challenge. In assessing the future demands that digital learning is placing on broadband connections, the State Education Technology Directors Association (SETDA) has developed a set of short and long term Internet access and wide area networking broadband connectivity recommendations for schools to prepare for digital learning traffic growth to increase broadband connection bandwidth demand 10 times in the next three to five years (see Table 1). These same recommendations have been adopted by the FCC in the E-Rate Modernization plan that will provide support to schools and libraries in obtaining affordable broadband connections.

Table 1: Digital Learning Traffic Growth Projections

Broadband Connections	2014-2015 School Year	2017-2018 School Year
External internet connection	100 Mbps/1,000 students	1 Gbps/1,000 students
Internal WAN connections	1 Gbps/1,000 students	10 Gbps/1,000 students

Over this period, as school districts move to remediate their broadband connection shortfalls, their legacy internal networks will have traffic bottlenecks exposed at their routers, switches, and firewalls as they hit their capacity limits. It is therefore critical for school districts to plan for the network modernization to take into account the need for a scalable network that can be economically built over a 5-year plan with the proceeds of their E-Rate Category Two 5-year budget. Not taking into account the short and long term connection capacity targets in a 5-year plan can leave a school district short of supporting digital learning and expose them to larger than expected out-of-pocket costs to accommodate the estimated digital learning traffic growth.

Juniper is well positioned to help schools address this challenge. Juniper switches, routers, and next-generation firewalls form the foundation of a scalable distributed school district network with available high 1GbE, 10GbE, 40GbE, and 100GbE wire-speed port densities that dramatically simplify network topologies and operations. On select Juniper Networks® EX Series Ethernet Switches, an Enhanced Limited Lifetime Warranty is standard to help protect the district's investment. Virtual Chassis and Junos® Fusion Enterprise technologies enable multiple interconnected EX Series switches to operate as a single device, reducing operational expense and management complexity.

For schools and libraries pursuing E-Rate projects, Juniper offers a rich portfolio of E-Rate Category One and Two eligible products and services summarized in the table below.

E-Rate Eligible Components		EX Series Ethernet Switches	QFX5100 Switches	SRX Series Services Gateways	MX Series 3D Universal Edge Routers	Next-Gen 802.11 from Juniper WLAN partners	Juniper Care
E-Rate Category	Component Type						
Category One	Modulating electronics to light leased dark fiber or self-provisioned fiber	✓	✓	✓	✓		✓
Category Two Internal Connections (IC)	Access points, antennas					✓	
	Cabling, connectors	✓	✓	✓	✓	✓	
	Firewall			✓			
	Switches	✓	✓	✓			
	Routers	✓	✓	✓	✓		
	Wireless controller systems					✓	
	Software	✓	✓	✓	✓	✓	
Category Two Basic Maintenance of Eligible Broadband Internal Connections (BMIC)	BMIC covers repair, configuration changes, basic remote technical support, software upgrades, patches, bug fixes, and security patches, time and material. For all Juniper E-Rate eligible Category Two Internal Connection components, the following Juniper Care services are applicable with the following eligibility factors: ✓ Juniper Care Core 100% eligible ✓ Juniper Care Next-Day Ship, Delivery, Same-Day, Onsite options are partially eligible						

[1] CoSN's Annual E-Rate and Infrastructure Survey

Reason 2: Juniper Networks Unite modernizes and simplifies school networks into a cloud-enabled digital learning service platform

For K-12 Education, there is no turning back in the trend of widespread adoption of online, cloud-based Education applications, digital content, and technology capabilities to accelerate digital learning. The expansion of online learning, virtual classrooms and online assessment further illustrate this trend. Unfortunately, the majority of today's school district networks are challenged to provide the capacity and performance to scale for the short to long term digital learning traffic growth and are manual systems comprised of layers of switches and VLANs, with multiple management points requiring different tools which all add to operational complexity. Multiple layers and flavors of security solutions are also common, with single purpose appliances in place ranging from content filters and load balancers to firewalls, adding more to this complexity. Because these layers of products must be administered manually, the potential for configuration errors that disrupt digital learning or open security gaps increases, making it riskier and more challenging than ever to operate and manage.

Juniper Networks Unite[2] addresses these challenges by cloud-enabling school district networks to offer rapid deployment of new services and productivity improvements for teachers, students, and staff. As a reference architecture, Juniper Networks Unite provides a common, converged network spanning school building locations and recognizes and supports a diverse set of wired and wireless devices, applications, people, and things, seamlessly and securely connecting them to digital learning services. Juniper Networks Unite cloud-enabled district networks make the IT department a "service provider" for the district's distributed locations, enabling the delivery of reliable, scalable, and secure connectivity that links students, teachers, staff, guests, and remote workers across school buildings, remote campuses, and the central office to a common system. Built on Juniper's industry leading routers, switches and next generation firewalls, Juniper Networks Unite achieves this by:

- Simplifying the infrastructure by collapsing core, distribution, and access network layers into a single logical platform managed from a central location
- Providing comprehensive security and control for a secure foundation over the entire school district network
- Providing an OPEN Converged Framework allowing school districts to integrate best-in-class solutions from wireless LAN, unified communications, network access control and security vendors without locking school districts into single vendor, proprietary approaches

Simply put, Juniper Networks Unite is a new education network reference architecture that provides school districts with a simplified, more agile, and secure network infrastructure solution they need to transform their districtwide network into a cloud-enabled service platform that is ready for digital learning.

Reason 3: Juniper secures school district networks and helps protect privacy and security of student data

School districts are bound by state and federal guidelines and laws (including FERPA, CIPA, COPPA and HIPAA) that address student data security requirements. Digital learning exposes schools and school districts to security attacks that are increasing in sophistication, number, and type to target private data and/or disrupt school operations. Though applying security at the network edge has been customary in the past, now—with new threats popping up every day, sometimes already inside the school district's perimeter—this is no longer adequate. With estimated 60% year-over-year growth in traffic due to digital learning, disparate legacy security appliances such as firewalls, antivirus, antispam, load balancers, and content filters become overwhelmed and upgrading these boxes become an expensive proposition, especially when decisions are made to overbuild appliance capacity in anticipating future traffic demand.

Juniper Networks Software-Defined Secure Network (SDSN)[3] offers an innovative, unique approach protecting districts by using the entire network to eliminate threats from the outside and within, combined with industry-leading threat detection and the ability to enforce policies dynamically and globally. Juniper provides the building blocks that turn the entire network into a single enforcement domain with the application of security policies that dynamically adapt as the threat landscape evolves. Juniper's approach gathers and distributes threat intelligence from multiple sources including third party and pushes policies into the network to instantly stop threats.

Reason 4: Juniper enables integration of best-in-class next generation 802.11ac wireless for classroom Wi-Fi

For digital learning, school districts instruction delivery and learning will leverage predominantly wirelessly connected devices, either school provided in a 1 to 1 initiative or student provided in a BYOD initiative. Therefore, classrooms and study areas will need to be outfitted with high-density wireless networks to support the high density of students and devices. With each succeeding 802.11 generation of Wi-Fi industry standards, increasing digital learning traffic will strain the district's network infrastructure performance, capacity, PoE powering for access points, and network security.

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[2] Learn more about Juniper Networks Unite www.juniper.net/us/en/solutions/cloud-enabled-enterprise
[3] www.juniper.net/us/en/solutions/software-defined-secure-networks

Given this challenging situation, many school districts have not ventured past building their entire network infrastructure using a single vendor proprietary solution set. In many instances, given the need for performance, scale, and reliability, these solution sets are not necessarily best-in-class, perform at a cost premium, and impose a vendor lock-in strategy that penalizes school districts at a time where they are looking for total cost of ownership savings and lower complexity.

Fortunately, Juniper school district customers are seeing the benefits of building their network infrastructure in a way that is OPEN and multivendor. Through Juniper's Open Convergence Framework (OCF)[4], school districts free themselves of single vendor lock-in, gain the flexibility to implement best-in-class technologies, and gain performance and value advantageous for savings and lower complexity. Within OCF, Juniper and its technology alliance partners together provide comprehensive interoperable wired and wireless LAN solutions that deliver high-performance, easy-to-manage, and secure school district networks for the best user experience. Juniper's wireless LAN technology alliance partners include Aerohive, Aruba Networks, and Ruckus Wireless, all well trusted in K-12 Education.

Reason 5: School districts build more network, with higher performance, for less money from Juniper Networks

Many school districts have turned to the Schools and Libraries Program (E-Rate) to make their network modernization project more affordable. However, with the new 5-year Category 2 services E-Rate budget[5] cap combined with the district's out of pocket share, many districts may have only been able to address a portion of their project. One main reason is the higher cost alternatives from brands like Cisco when considered for E-Rate internal connections projects.

Juniper provides a superior option. Juniper Networks help districts get more network, with higher performance, for less money. Our mission-critical routing, switching, and network security platforms not only deliver the digital learning experience, but we do it at a lower total cost of ownership (TCO) level, stretching the district's dollars. When school districts factor CapEx, Opex, space, and power costs over a 5-year period, Juniper solutions have an estimated better TCO. In addition, if it is for an E-Rate project, the Juniper option offers lower out-of-pocket costs while using less E-Rate budget.

Table 2 illustrates these advantages with a district of 6,725 students, 8 primary, 3 middle, and 2 high schools analyzed, generating an estimated 5-year TCO advantage just over 52%[6].
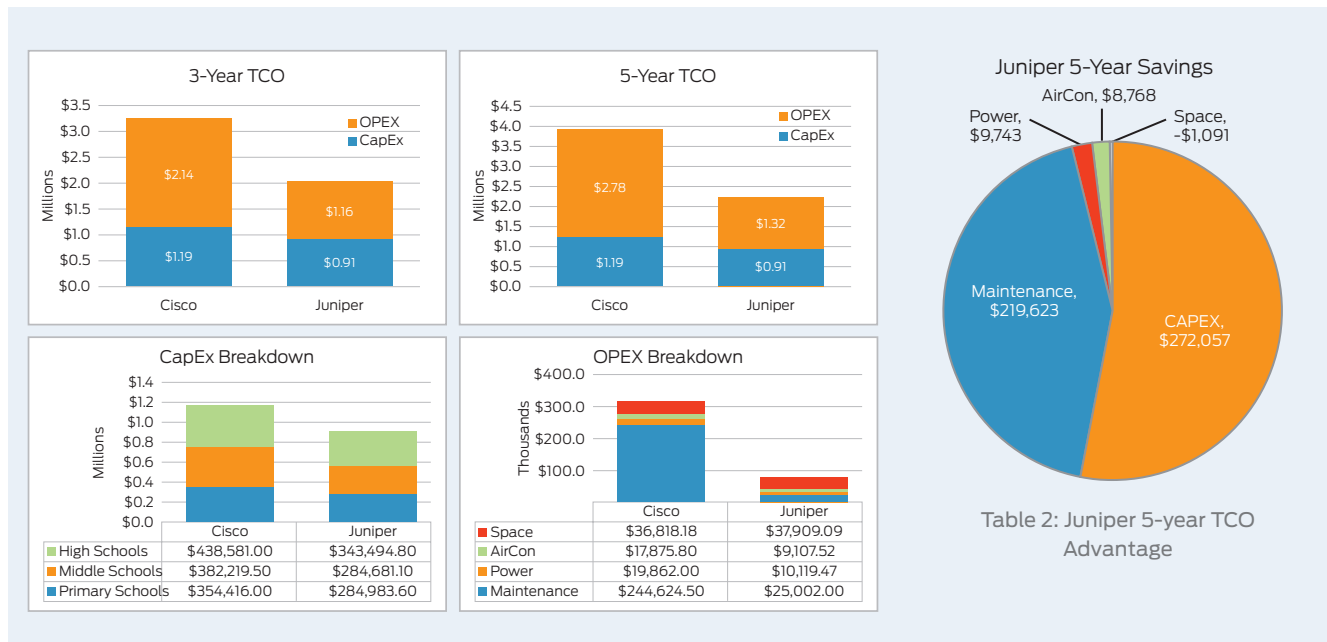
Table 2: Juniper 5-year TCO Advantage

Next Steps

Visit www.juniper.net/us/en/solutions/education/k-12-education/ or contact your Juniper representative or Juniper Authorized Partner for more information about Juniper solutions for K-12 Education.

About Juniper Networks

Juniper Networks challenges the status quo with products, solutions and services that transform the economics of networking. Our team co-innovates with customers and partners to deliver automated, scalable and secure networks with agility, performance and value. Additional information can be found at Juniper Networks or connect with Juniper on Twitter and Facebook.

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1600089-001-EN   Apr 2016

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