

Prepare Your Network for Common Core Online Assessments

Online assessments place new demands on schools districts' networks



Common Core Online Assessments Solution Overview

Network connectivity for K-12 schools is no longer a convenience. With the embrace of digital learning and the Common Core State Standards online assessments, fast, reliable network connectivity is mission-critical. But many school districts' networks are not prepared for the rigors of online assessments and digital learning. Districts can rely on Juniper Networks for high-performance network and security solutions as the foundation for online assessments and everyday learning.

Challenges

The Common Core State Standards are designed to prepare students for college and careers. The Common Core sets nationwide standards for what students should know and be able to do in each grade, from kindergarten through senior year. Forty-three states, the District of Columbia, and four U.S. territories have adopted the Common Core in English Language Arts and Math.

Online assessments are a fundamental part of the Common Core. Online assessments make it easier to grade tests and increase testing security. Teachers, students, and their families get the results faster, which is essential to pinpoint gaps and make accommodations more quickly. Online assessments are required for the 2014–2015 school year and beyond.

The majority of states have adopted Common Core assessments developed by Partnership for Assessment of Readiness for College or Careers (PARCC) and Smarter Balanced Assessment, although a few states are implementing their own assessments. Assessments are conducted online over several weeks.

Many schools are using tablets, netbooks, and laptops in the classroom, and the adoption of digital learning is increasing dramatically as schools move to 1:1 computing or bring-your-own-device (BYOD) initiatives. But the stakes are even higher when conducting online assessments, and schools need to ensure that their technology infrastructure is ready. Schools' laptops, netbooks, and tablets must meet the minimum technology requirements set by PARCC or Smarter Balanced. Schools must have enough test-taking devices for every student, whether each student has his or her own device or they use computers in a testing center or lab. Critically, districts need to have reliable, secure connectivity so that online assessments are not interrupted.



Trends: Getting the Network Ready for Online Assessments

The reality is that many districts lack the necessary connectivity to support online assessments and digital learning in schools and will need to expand their network infrastructure. The State Educational Technology Directors Association (SETDA) established minimum bandwidth requirements for digital learning. These recommendations increase 10 times for the 2017–2018 school year (see Table 1). In the 2015 K-12 IT Leadership Survey by the Consortium for School Networking (CoSN), Assessment Readiness is the number one priority for IT leaders, yet less than 30% report they are fully prepared for online assessments.

Table 1. SETDA Recommendations for Minimum Bandwidth

Broadband Access for Teaching, Learning and School Operations	2014–2015 School Year Target	2017–2018 School Year Target
External connection to Internet	At least 100 Mbps per 1,000 students and staff	At least 1 Gbps per 1,000 students and staff
Internal WAN connection from district to schools and among schools in district	At least 1 Gbps per 1,000 students and staff	At least 10 Gbps per 1,000 students and staff

Both PARCC and Smarter Balanced have recommendations for network capacity to support online assessments (see Table 2).

Table 2. Consortia Bandwidth Recommendations for Online Assessments

Tiered Recommendations for External Connection to the Internet	Smarter Balanced	PARCC
Minimum with caching	5 Kbps per device in simultaneous use device	
Minimum without caching	50 Kbps per device in simultaneous use device	20 Kbps per device in simultaneous use device
Recommendation for assessment and instruction	100 Kbps per device in simultaneous use device	

Given these recommendations, District IT leaders and administrators should prepare their infrastructure to support online assessments by assessing several critical factors:

1. **Do the schools have sufficient and stable bandwidth to connect to the testing provider?** Make sure the Internet connection to the testing provider can handle the assessment content. Districts can use quality-of-service and traffic shaping techniques to ensure that the most critical applications, including online assessments, get the bandwidth they need over the WAN.
2. **Do the schools' wired and wireless LANs deliver sufficient performance?** Make sure the district's internal network can deliver the performance needed to support online assessments. Most schools use tablets, netbooks, or laptops for assessments, which require a high-performance, wireless LAN connection. Schools may need to conduct an RF site survey to determine the appropriate levels of Wi-Fi coverage and capacity and to identify any unauthorized, or rogue, access points. Districts may need to upgrade from older 802.11a/b/g networks to 802.11n or even the higher performance gigabit Wi-Fi technology, 802.11ac, to support a highly dense Wi-Fi client environment. Additional wireless access points will need to terminate to sufficient quantities of Power over Ethernet equipped switches and ports. For 802.11ac access points, each will consume two 1 GbE switch ports.
3. **Are firewalls and content filters ready?** Depending on your online assessment provider (PARCC or Smarter Balance), all communications with the network take place over a specified set of Internet ports/protocol combinations. School districts should ensure that the specified ports are open for these firewall and content filter systems. Also allow specified Multipurpose Internet Mail Extensions (MIME) types for downloading and uploading, and open firewall access to the specified URLs or IP addresses.
4. **Is network resiliency built in?** Students' assessments should not be interrupted even if there is a failure anywhere in the network. If a fault occurs, the wired and wireless LANs must recover quickly enough that students' work is not lost and testing is not delayed.
5. **Is the network secure?** Have all security vulnerabilities been addressed and is access to the online assessments properly controlled? Is there adequate threat protection and defense from distributed denial-of-service (DDoS) attacks that can cripple online assessments? Due to the sensitivity of the test data, keeping this data private over wireless networks requires the traffic to be encrypted. Wireless traffic is recommended to be encrypted using WPA2/AES data encryption. Districts can take steps to minimize testing fraud by using 802.1X authentication to authorize students' network access. Is it easy to provision and onboard tablets, netbooks, or other mobile devices used for assessments and learning?

6. **Is the IT support team ready?** Does the district's IT support staff have the skills needed to support the infrastructure and online assessments? Look for ways to simplify network operations, including unifying the management of wired and wireless LANs with a single pane-of-glass management tool. Using automation tools can speed network configuration and reserve network bandwidth for assessment periods. Automated in-service software upgrades minimize the need for maintenance windows and reduce planned downtime.



Juniper Networks Solution Portfolio for K-12 Schools

Juniper Networks provides scalable, secure, and seamless network solutions for education institutions. K-12 school districts, both small and large, have put their trust in a Juniper infrastructure to support online assessments and digital learning in the following areas:

- High-performance and scalable Internet connections
- High-performance switching
- Safe and simple mobile learning
- District-wide network access and security
- Simplified and automated network operations

High-Performance and Scalable Internet Connections

With Juniper routing solutions, school districts can count on high-performance, highly reliable connectivity for WAN aggregation and the Internet edge. Juniper Networks® SRX Series Services Gateways are a high-performance platform that consolidates routing, WAN connectivity, switching, and next-generation firewall, within a single, easily managed gateway. SRX Series Services Gateways deliver perimeter security, content security, application visibility, tracking and policy enforcement, role-based access control, and network-wide threat visibility and control.

To protect a school's network from the latest content-borne threats, SRX Series provides a complete suite of Unified Threat Management (UTM) services, including intrusion prevention system (IPS), application security (AppSecure), on-box and

cloud-based antivirus, antispam, enhanced content and Web filtering, and data loss prevention. Having all this on a single gateway simplifies deployment and administration and helps lower a district's TCO while delivering fast, consistent service quality to school sites.

Large school districts can take advantage of the industry-leading capacity, density, and performance of Juniper Networks MX Series 3D Universal Edge Routers for WAN aggregation, Internet edge, and campus backbone networks. This element plays a central role in enabling a school district's strategy to put in place a next-generation Internet service delivery model for digital learning, one that is higher performance, more scalable, enhances reliability and disaster recovery so vital for 24x7 digital learning. MX Series routers are powered by Juniper Networks Junos® Operating System and a programmable Junos Trio chipset, and managed by Juniper Networks Junos Space Network Management platform and applications.

High-Performance Switching

Juniper provides high-performance, scalable switching with carrier-class reliability to support the rigors of online assessments and digital learning. Juniper Networks EX Series Ethernet Switches deliver access, aggregation, and core switching from the data center to the school site. In the campus, EX Series Ethernet Switches address the demand for high availability, mobility, and virtualization and deliver operational efficiency, business continuity, and network agility. EX Series switches are also ideal for today's highly virtualized server environments, multimedia applications, and interactive curricula.

School districts can simplify their networks and lower operations costs. Juniper Virtual Chassis technology allows multiple interconnected EX Series switches to operate as a single, logical device, which consolidates switch layers and reduces management overhead, while the switches can programmatically respond to evolving educational needs. Depending on how widely Juniper Virtual Chassis technology is applied in a district, schools can see a reduction of 90 percent fewer managed devices. All EX Series switches run Junos OS, ensuring consistent, predictable behavior across the entire infrastructure.

Safe and Simple Mobile Learning

Many schools lack adequate Wi-Fi to support the high-density mobile environment that is increasingly typical of the classroom. A wireless LAN (WLAN) solution from Juniper or one of our wireless partners is built for this environment. Districts can deploy a best-in-class high-density Wi-Fi network that is highly resilient and highly scalable to support mission-critical classroom instruction and online assessments.

These solutions deliver seamless mobility for indoor and outdoor deployments, with the performance and reliability required to support real-time interactive curricula, voice, and video applications. Built-in security and network services allow the

wireless access points to forward and encrypt traffic locally for the highest levels of privacy and performance. These solutions use multiple techniques, including band steering, client load balancing, dynamic authorization, quality of service, bandwidth controls, and dynamic call admission control, to ensure a consistent and flawless user experience, even during high-use periods such as online assessments.

Juniper or one of our wireless partners offers solutions that deliver and manage wireless LANs with the highest level of reliability, performance, security, and management in the industry.

District Wide Network Access and Security

Districts can count on Juniper for comprehensive campus and data center security. With Juniper and our security solution partners, districts can enable policy orchestration between wired networks, wireless LANs, network access control (NAC), and secure remote access. District IT administrators can ensure end-to-end segmentation based on user roles, such as students, teachers, administrators, and guests, across the entire network, including wireless, wired, mobile, VPN, and at remote sites. Districts can create and enforce dynamic network access policies based on user identity and role, device type and integrity, and location. This approach reduces network threat exposure for schools, protecting critical applications.

Schools can provide quick, easy, and foolproof access to their wired and wireless networks for BYOD and school-owned devices. Schools can offer self-service onboarding for student, teacher, and guest mobile devices, which eliminates user hassles and the need for IT intervention. Schools can use username/password-based 802.1X or certificate-based authentication. Either way, the approach provides an exceptional user experience and reduces the cost of WPA2-Enterprise access to wireless networks or personal devices.

Simplified and Automated Network Operations

As districts prepare to meet the demands of Common Core, 1:1 computing, and blended learning, they can turn to Juniper Networks Professional Services for a comprehensive Campus Assessment Service to determine their network readiness. In this one-week engagement, Juniper Services professionals review requirements, develop a strategy and implementation plan, and issue their findings and recommendations.

Schools can simplify network deployment and troubleshooting, improve uptime, add capacity more easily, and reduce OpEx with automation tools. Juniper Networks automated workflow helps school districts simplify their implementation and ongoing operational workflows using zero touch provisioning with Juniper campus and branch solutions, including Juniper Networks MX Series 3D Universal Edge Routers, SRX Series Services Gateways, EX Series Ethernet Switches, QFX Series Switches, Junos Space Network Director, and other Juniper platforms running Junos OS.

Juniper Networks Care Services is a suite of services that provides rapid response from Juniper Networks Technical Assistance Center (JTAC) engineers, and hardware replacement options that let schools choose the right timing and resources for their network needs. Juniper Care increases operational effectiveness and lowers operational costs for schools by utilizing Juniper Networks Junos Space Service Now to reduce the time for problem identification and diagnostics. This allows school IT staff to concentrate on strategic activities, not fixing equipment.

Summary: Meet Common Core Online Assessment Requirements

The Common Core promises to prepare our children for college and careers, and a new modern online assessment process will measure their success as they venture into new educational territory. Districts can depend on Juniper Networks for high-performance, reliable, and secure district-wide networks that won't get in the way of learning or add to the IT administrative burden, allowing teachers and administrators to focus on their students.

About Juniper Networks

Juniper Networks is in the business of network innovation. From devices to data centers, from consumers to cloud providers, Juniper Networks delivers the software, silicon and systems that transform the experience and economics of networking. The company serves customers and partners worldwide. Additional information can be found at www.juniper.net.

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

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