Issue Brief

CENTER FOR DIGITAL EDUCATION

Wireless in a K-12 Environment:

Moving ahead with technology

What is a K-12 wireless environment?

In today's learning environment, digital devices have become fixtures in the classroom. Students use tablets or e-readers to display digital textbooks. Smartphones are used to access learning applications. Schools that support 1:1 (one student to one computer) netbooks or laptops enjoy enhanced class participation and access to additional learning tools. Teachers use interactive whiteboards and utilize laptops for administrative tasks or student management. This current technology renaissance in education results in greater student engagement, resource availability and teaching mobility. However, devices demand an unprecedented amount of bandwidth and flexibility, so schools are increasingly turning to wireless networks.

Wireless, or Wi-Fi, environments allow campus-wide connectivity without space or traffic restrictions, and provide security for student access. They're also proving more cost-effective, easy to deploy and scalable than wired networks. Wireless environments provide an elegant way to get around budget-restrictive network upgrades and the wiring of older buildings. Luckily, sophisticated wireless connectivity not only offers high bandwidth and increased reliability, but also can be affordable and easy to deploy. These enterprise-class networks meet the specific requirements of schools. Schools that have already implemented successful solutions are finding that wireless environments support their commitment to a technology-savvy learning environment.

Why is it important now?

Wireless environments keep schools up to date with the digital advancements in today's world — but implementing Wi-Fi doesn't have to compromise budgets. Important expenditures like teacher salaries and classroom materials might otherwise prevent schools from upgrading wired networks across a campus or whole districts. However, when implemented properly with the right vendor, Wi-Fi is safe and secure, simple to install and maintain, and supports technology growth by accommodating digital learning-enhancing devices. The speed with which devices have become common learning tools — even embedded in educational curriculums — indicates schools can't afford not to ensure wire-free connections.

Districts that employ mobile learning, including online classes, might require individualized security features found in wireless architecture, especially where students can access content on their own devices. Wired networks don't support mobility and resource sharing such as computers or interactive whiteboards between classrooms or across campuses. With classrooms full of users, plus teachers and administrators accessing learning and management tools, a robust network that can handle large volumes of traffic is essential. Wireless environments aren't limited to hardware or location, and some vendors offer features that manage traffic so the performance of the network is never compromised.

Network safety is a key concern when managing students on various mobile devices. Different Service Set Identifier (SSIDs), WPA2 encryption and restricted IP ranges in wireless infrastructures help manage this. Inappropriate content can be blocked from individual mobile devices that bypass old network content filtering, and students who abuse the connection can be individually restricted.

Learning management systems, online learning and assessment, and student information systems are a few examples of a technology-friendly curriculum already incorporated in classrooms. Inside the classroom, laptops, netbooks, tablets and interactive whiteboards have become fixtures. Students move beyond figurative classroom walls with access to the Internet as a complement to class work. Parent-teacher communication can occur quickly when teachers have access to student records and e-mail during class. Teachers can use electronic grade books, attendance forms and class materials on the school network. Wireless environments support all of these new forms of learning and teaching by offering a constant, safe connection.

What are the benefits?

Less hardware

Certain wireless systems offer less hardware to pay for, install and manage. Some wireless providers offer networks without controllers. These typically feature software that allows access points to self-organize into groups, which are then centrally managed. Any problems on the network are transparent to overall connectivity. Scalability is especially easy with a system without a controller, so districts that want to add wireless to more schools can easily plug into existing architecture.

Higher network performance

In schools that support 1:1 learning, a class full of students that boots up and connects all at once can bog down wired networks. As traffic grows, connection problems result. This can also be true of older wireless schemes that

employ controllers. Controller-free wireless networks that use software reduce bottleneck and enhance overall performance while maintaining network security requirements.

Ease of deployment

Centralized configuration and monitoring can make system-wide network policy management a breeze. Typically, software automatically discovers access points. The network manager sees where they're connected and uses the data to determine appropriate access point coverage. Network policies can be pushed out through software in an instant. Older systems typically involved costly consultants, hefty installation costs and licensing fees per access point. Prioritizing network requirements might include not paying costs for equipment that isn't necessary, and sourcing systems that are easier to install. Wireless offers those solutions.

Supports client apps for user visibility

Some wireless systems have the added advantage of applications that help customize learning, which supports students meeting federally mandated learning guidelines. Applications include monitoring and reporting systems that allow teachers to view device connectivity status, or give districts the ability to track and monitor wireless use in schools. Teachers can disperse a Web address to all laptops in a class, or view which online resources students are accessing. Blocking Web use during class so students can't browse the Internet is also possible. These applications remove the teacher from the position of being a networking expert, and allow for more time spent on learning.

Eliminates budget surprises

Upgrading wired networks can be cost-prohibitive, especially in buildings with older wiring — and often wired networks come with requirements to add additional applications like VPN (Virtual Private Network). With wireless connectivity, students and teachers can use their own devices to connect, saving cash-strapped districts computer costs.

Who's doing it?

Framingham Public School District

Framingham Public School District in Massachusetts got around budget restrictions to satisfy teacher computer requirements by adopting a "university model" that allows students and teachers to use their own devices — which in turn required a safe wireless network. The district solved the problem of students who were bypassing the district's content filtering with their mobile devices by upgrading to a wireless scheme that allowed a segmented campus network and restricted IP ranges. Now handheld devices are encouraged rather than seen as a problem — administrators use handheld devices to quickly access student information, and students can use handhelds for classroom participation, without concern for safety or device availability.
www.schoolcio.com/showarticle/29886

Harrisonburg City Public Schools

Harrisonburg City Public Schools in Virginia's Shenandoah Valley serve 4,400 students in 10 facilities that cover elementary, middle, and high school, with a special education center and an administrative office. The school upgraded an existing wireless network that stumbled on power outages and suffered with continually moved or unplugged access points. The new architecture employs mesh connections, which mean no single points of failure within the wireless infrastructure, and central, software-run access points that are visible to network managers. Teachers enjoy mobile labs without having to worry about plugging and unplugging access points. An easy software configuration allows instant recognition of new access point groups, getting additional wireless coverage up and running at any time, easily and cost-effectively.
www.aerohive.com/resources/harrisonburg-city-public-schools

Wheaton Academy

West Chicago's Wheaton Academy is a college preparatory Christian high school that prides itself on technology to deliver high standards of education. The school's wireless network is no different — it employs 802.11n, the latest wireless technology, and has separate virtual LANs with Service Set Identifiers (SSIDs) for staff and students. Wheaton's wireless system uses no controllers — which frees up connection bottleneck and saves hardware costs. The roaming capability of the new network allows teachers to move around the campus freely while remaining connected. All of the features of the wireless environment met the school's requirements, underscoring the Academy's commitment to using technology to deliver the highest quality of educational excellence.
www.aerohive.com/resources/wheaton-academy

Where can I find out more?

- Business Grade Wi-Fi for Education: www.aerohive.com/solutions/solutions-industry/education
- Aerohive Product Overview: www.aerohive.com/products
- StudentManager: www.aerohive.com/products/applications/studentmanager