BUILDING THE K-12 NETWORKS OF THE FUTURE TODAY

HOW WIRELESS TECHNOLOGY IS HELPING K-12 DISTRICTS AND SCHOOLS FUTURE-PROOF THEIR E-LEARNING NETWORKS.

Virtually everywhere in the world, K-12 school district leaders are engaged in improving their communications infrastructures. They want to take maximum advantage of revolutionary new educational technologies. They want to keep up with the new online world of their students. And they want to enter the expanding learning world of Google, Moodle, Facebook and Twitter.

A few districts may already have their networks of the future in place, but most are somewhere in the planning and deployment process. Some are just starting. But no matter where your district is in the process, you and your IT Department should be asking yourselves two crucial questions. One, are you keeping your future needs top of mind in everything you're doing technologically today? And two, are you making sure your network is scalable to accommodate future growth and future capabilities? In other words, are you making sure your network is future proof?

E- LEARNING TRENDS

The future K-12 districts are preparing for is truly exciting. As always, the overarching goal in education is improving student performance, and today's preferred methodology is to move to a more individualized learning model. Enabling this more personalized educational future suggests a number of technological trends that affect, or will soon affect, virtually every school.

1:1 COMPUTING. The gold standard for increasing personalized learning and individualized content is the 1:1 computing model, i.e. learning environments in which every student is able to use his or her own computer or computing device. These range from laptops to netbooks to PDAs to pad computers to smart phones.

A WYOMING SCHOOL DISTRICT DOES THE MATH ON WIRELESS TESTING

Campbell County's K-12 School District needed to expand system connectivity for two crucial reasons. One, to support its advanced interactive e-learning efforts. Two, to provide a reliable platform for administering state-mandated testing, including the critical Proficiency Assessments for Wyoming Students (PAWS). With wired systems proving to be too cumbersome and expensive, the district turned to wireless. After experiments with wireless solutions that had reliability problems and were too costly, Campbell County found the ideal solution in Motorola's WLAN. The Motorola system provides the reliability and confidence students need as they take the extensive PAWS tests online, no longer having to worry about the system failing mid-test. The network also offers simple, fast planning and implementation, secure connectivity for interactive and collaborative learning, centralized network management and control and a lower overall total cost of ownership.

UBIQUITOUS ACCESS. The proliferation of web-enabled devices available to students and teachers make it possible to expand learning experiences well beyond the classroom, the study hall and even the textbook. High-speed connectivity to the web and the school's Intranet provides students with anytime, anywhere access to assignments, the ability to delve into vast databases of information for research and to communicate directly with peers and teachers.

ADVANCED LEARNING TECHNOLOGIES. Teaching has moved far beyond the limitations of the traditional classroom of teachers teaching and students listening. The new learning environments of today and tomorrow are more efficient and more flexible. Third-party learning applications such as SAFARI Montage and Discovery Education network provide content that includes powerful technology tools such as streaming video on demand. Learning management systems like Moodle and Blackboard enable teachers to create lessons and exercises online, to generate tests and even to initiate online educational communities that can include students, teachers and parents.

ONLINE ASSESSMENT. In a few short years many states will be migrating to all online and computer-based assessment in order to provide more rapid reporting, better management of data, improved security, and ultimately ease of use and cost of administration. Gone will be the days of bubble forms and number 2 pencils. A growing number of schools are currently doing online testing, but many are restricted to using only their wired systems until they are able to deploy more robust wireless networks.

COLLABORATIVE LEARNING. High-speed communications enable students already using interactive communications on social networking sites to collaborate in real time with other students on common projects and assignments, and to interact with teachers

via e-mail or during online "office hours." With the advent of technologies like Skype, it's also easier than ever to communicate and collaborate with schools and classrooms on other campuses, in other states and even in other countries.

PREPARING FOR TOMORROW

Preparing K-12 districts and schools for the new technology-based future is necessary but not simple. The reality is, district IT directors are dealing with two kinds of networks. The first is the outdoor wide area network (WAN) that delivers access to school and administrative facilities. The second is the indoor local area network (LAN) that provides access for indoor areas such as classrooms, study halls and offices. Today, as many districts are quickly learning, there are two significant challenges that combine to make planning and deploying both these networks more difficult and complex. These are cost and bandwidth.

ROCKY MOUNTAIN HIGH-SPEED LEARNING

Snow. Ice. Lightning. 100 mph winds. Located in the Rocky Mountain community of Loveland, Colorado, Thompson School District sees it all. To deliver innovative new web-based learning capabilities to its 15,000 students, the district needed high reliability in difficult weather conditions, and decided to upgrade its communications network. But deploying a new fiber network was too costly. The solution? A Motorola fixed point-to-point high-speed wireless network. Despite line-of-sight challenges, the network is now delivering exceptional bandwidth, which enables high-speed Internet-based educational applications, distance learning, classroom video, interactive video conferencing and much more. Fast and easy to install, the network is now providing broadband access across 33 campuses at distances of up to 13 miles. In addition, the system is delivering exceptional cost-effectiveness and return on investment.

EXTERIOR CHALLENGES

Most districts have existing wired networks that connect one or a few locations, many using T1, T3 or fiber lines for connectivity to the school. But what about expansion? T1 and T3 circuits have limited bandwidth and restrict schools from taking advantage of all the digital content and resources available to them. And while fiber offers an exponential increase in bandwidth over T1 and T3 circuits, there are still many areas — rural locations and even some urban and metro areas where roadways block the installation of fiber — where telecommunications and cable providers cannot offer high-speed fiber to schools. Installing a privately owned fiber network, for most districts, is an overly complicated and cost-prohibitive proposition.

An equally critical challenge is the need for — and the cost of — bandwidth. Virtually all the learning technologies of the future are extremely bandwidth-intensive. To avoid placing a stranglehold on students' and teachers' abilities to use learning technologies to maximum benefit, the WAN must deliver high bandwidth rates to the school. That's expensive, too, since most commercial networks base leasing rates on the amount of bandwidth needed, which can quickly drive up recurring costs.

INTERIOR CHALLENGES

Indoor LANs have their own cost and bandwidth issues. The cost of wiring and rewiring as classrooms, offices and other interior areas are configured, reconfigured and remodeled is significant. Delivering sufficient bandwidth is also a concern. There's no question that the e-learning technologies of today and tomorrow — streaming video, collaborative learning environments and high-speed downloads and more — are bandwidth-intensive. Schools must ensure that their LAN is able to consistently provide the high throughputs needed for students and faculty to utilize these and other bandwidth-hungry applications — both as a class and individually — inside the classrooms, library, study halls and other areas. They must also make certain the network provides the mobility necessary to include the myriad of devices students constantly rely on in today's anytime, anywhere learning environment.

MULTI-MEDIA ON DEMAND FOR 30,000 STUDENTS IN TEXAS

Keller Independent School District (ISD), one of the fastest-growing school districts in the state of Texas, comprises 36 schools with some 30,000 K-12 students. To support its e-learning activities, including a 1:1 computing initiative that will eventually include wireless devices for every student, the district partnered with Motorola. To improve on spotty coverage provided by the district's previous wireless network, Keller ISD deployed Motorola's 802.11n wireless LAN infrastructure and the Motorola AirDefense wireless security and network assurance solutions. The district also chose SAFARI Montage video-on-demand to deliver digital e-learning content to dense classroom environments over the robust new network. Together the Motorola wireless broadband network and the SAFARI Montage video system are enabling Keller ISD to deliver multicast and unicast video streams simultaneously to multiple clients in classrooms across the district.

THE MOVE TO WIRELESS

Given the cost and bandwidth issues inherent in wired solutions, it's no surprise that more and more K-12 districts worldwide are turning to high-speed wireless networks as their technology of choice for both WANs and LANs.

Outdoors, wireless broadband systems allow districts to overcome the formidable barriers of deployment expense and bandwidth cost. Wireless backbone networks can be planned quickly and, with no trenching, deployed exceptionally cost effectively. In a recent report, industry analysts the Greaves Group stated that, "The rapid growth of [wireless broadband] solutions has allowed districts to substantially expand data rates at a lower cost per megabit than [wired] solutions."

Indoors, wireless local area networks (WLANs) also provide the bandwidth needed for new e-learning applications at a much lower cost. The relatively new 802.11n wireless standard has quickly become the high-performance technology of choice for WLANs in a growing number of K-12 school districts. The exceptional throughput of networks based on 802.11n technology — up to 300 Mbps — is ideal for supporting multimedia learning content. In addition, most district networks will be accessed by student- and faculty-owned computers and handheld devices that are built to be 802.11n-compliant.

MOTOROLA'S WIRELESS EDUCATION SOLUTIONS

Motorola is currently helping countless K-12 school systems plan, deploy and operate effective wireless networks that enhance digital learning operations in the present, and also prepare districts' networks to succeed in the near-term and long-term future. Motorola is at the forefront of delivering advanced 802.11n performance that is more powerful and efficient at delivering the high bandwidth needed for digital learning applications. We are also a leader in providing the reliability, availability and security needed to ensure that every student and teacher is able to make the most of the advanced digital learning applications of today and tomorrow.

A growing number of K-12 schools and districts are partnering with Motorola as they plan to future-proof their e-learning networks. As a leader in the technology of both e-learning and e-living, we'd be pleased to help you in any way we can. Please call your Motorola representative, or call us at (877) 220-8301.

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the challenges, the opportunities and
the realities of how technological innovation
is affecting the markets that most influence
and affect the global community.

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