



AB&R

identify. track. manage.

Q&A: Expert Answers to Top Technology Questions from Private Schools



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Q: *Our students, teachers, and staff all have mobile devices that they're bringing on campus every day, and we also have school laptops and tablets that need high-speed Wi-Fi connectivity. How can we support all of these devices without bogging down our network and causing slow performance?*

A: This is the single biggest issue that we hear about in our conversations with schools. Unfortunately, many schools are struggling with slow Wi-Fi performance, poor wireless coverage, device connectivity issues, and wireless service outages. This is usually because the wireless networking technologies that were once the best available are now woefully outdated. They were never designed to handle demand from so many devices and provide the amount of bandwidth that today's students, teachers, and staff need. Also, the infrastructure that these technologies used was never designed to be affordably scalable to match future demands and needs. So these networks cannot be adapted to deliver the much higher bandwidth and output that newer devices and applications require.

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Ultimately, the solution to wireless networking problems is using next generation wireless LAN, which is wireless that is re-engineered from the ground up to ensure outstanding performance and reliability while it also meets any level of current or future network demand. Wireless next generation, or WiNG WLAN, greatly reduces short-term installation costs and long-term operational costs while providing a vastly more powerful and efficient architecture.

In simplest terms, WiNG WLAN creates an intelligent, self-aware, and self-healing wireless network that is vastly faster and more reliable than conventional networks. It provides unmatched campus-wide high-speed Wi-Fi and communications, with high bandwidth that is available indoors and outdoors, with no slowdowns, bottlenecks, or service outages.

Due to the intelligence of its hardware and the use of the latest wireless technology protocol, WiNG WLAN is much easier to install and maintain, but, more importantly, it provides maximum networking efficiency in connecting devices, routing traffic, and ensuring high-speed performance. In fact, WiNG WLAN has set the Guinness Book of World Records mark for wireless performance by delivering 84 simultaneous video streams through a single radio access point. Keeping in mind that a typical school wireless network is comprised of numerous access points, the total power and throughput of this technology is virtually limitless in school environments.

WiNG WLAN was designed and engineered by Zebra Technologies, owner of over 2,800 patents in wireless and a global leader in WLAN solutions. We strongly recommend this WLAN technology and specify it for all of our clients, including private schools, school districts, college and university campuses, and large businesses across a variety of high-demand industries.

Q: *Our school upgraded our Wi-Fi and wireless networking in the past, and we were promised high performance. But we ended up with slow service, and some areas of our campus still have no network access. Why is this happening and what can we do to fix it?*

A: This is a common problem among schools, and, unfortunately, it is often caused by technology vendors who offer false promises or specify the wrong solutions to meet the real wireless demands of today's schools. Another factor is that school budgets are often limited and must accommodate many needs beyond technology, so the focus is sometimes more on keeping costs low, and this leads to lower-performance wireless solutions being installed.

For example, in an effort to reduce costs or with the wrong recommendations from your vendor, you may end up not having enough wireless access points in place. You may not have the hardware quality and power to deliver signals through walls and barriers, you may lack the network intelligence to route traffic optimally and efficiently, or your network may make it difficult to locate the source of problems or recognize their causes. Thankfully, these issues can easily be resolved and avoided. No school has to sacrifice network quality or performance for affordability, and no school should have to suffer the pain of getting bad advice from a vendor.

The latest wireless technologies, such as WiNG WLAN, make it easier and more cost-effective than ever before to upgrade or build a high-speed and campus-wide Wi-Fi network. Next generation changes in the hardware

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and technical infrastructure of WiNG wireless networks provide huge improvements in performance and reliability, so you get remarkably fast performance and avoid slowdowns and ensure that your entire campus is connected at all times. Also, you can actually save considerable money in installation and maintenance costs because these solutions are so easy to set up and manage, and they eliminate the need for much of the expensive hardware that was formally required for networks.

The intelligence of these next generation networks and their simplified, convenient management tools make it incredibly simple and easy to resolve network issues if they ever arise. The network automatically re-routes traffic and heals itself to ensure connectivity and service in the event that a problem emerges. And your administrator can use the network's simple and user-friendly tools to quickly find the source of a problem and address it automatically and remotely.

Importantly, there are reputable and honest vendors who can help you take advantage of all of these benefits. When choosing a vendor, always verify its credentials, ask for references, and ask to review case studies that prove that it can deliver promised results. Also make sure that your vendor is confident enough to explain the strengths and weaknesses of any proposed solution and that it offers you a variety of upgrade or deployment options.

A good vendor will offer high-performance technologies from the leading brands in wireless networking, and it will help you develop a plan that suits your schools needs and budget. This can include scalable approaches to help you upgrade your entire network over time, as your resources allow. This way, you can address any lingering problems from previous upgrades and start building a new network as you go, or you can build an entirely new network in a matter of days and avoid any disruptions to your campus community in the process.

Q: *Many businesses are being hacked and data is being stolen. How serious is the threat for schools, and how can we make sure that our wireless network is protected from intrusions and unauthorized use?*

A: While much of the media attention on computer hacking has focused on incidents that have impacted major corporations, such as Target, Home Depot, Sony, and Anthem, Inc., the reality is that businesses of any size and even schools are frequently targets of cyberattacks. If your school maintains databases of student, faculty, and staff data, and it maintains databases of ID and password combinations that are used to access school applications, websites, and services, then it is a prime target for hacking. Whether those databases are hosted on your school IT infrastructure or in the cloud by third party vendors, they provide one of the primary motivations for attackers to hack into your school network and attempt to access them.

A single breach of your network can potentially lead to a number of data security disasters, including entire databases of sensitive information being stolen or malicious software being deployed to steal data over time, as it is transmitted through your network. Also, schools are facing a growing threat of hacking from their own students, with numerous incidents of students hacking into school databases and changing grades and records in recent years. And these incidents don't just involve changing grades or information for a single student. In a [*recent incident at San Dimas High School*](#) in San Dimas, California, two students were arrested on suspicion of hacking into their school's system and changing the grades of approximately 120 students.

The best approach for any school is to deploy the strongest possible data security to prevent and protect against attacks. One of the keys is to start with protecting your wireless network to ensure that unauthorized users cannot gain access and that you have multi-layered protection against a variety of threats. With the wireless next generation or WiNG networking solutions that we recommend, our school clients receive comprehensive, best-in-class security that provides all of the essential protections for wireless networks. But, no matter what wireless networking solution you are using, it is important to make sure that you have these protections in place:

Fundamental Security Requirements for School Wireless Networks

- **Tiered network security that protects and secures every point in your network**
- **A role-based firewall that protects against network intrusions, attacks, and unauthorized access**
- **Advanced encryption to protect data as it is transmitted through your network**
- **Advanced authentication to verify user identity and control user access**
- **Virtual LANs (VLANs) to separate student and teacher assets and connections.**
- **Role-based differentiated access for students, staff, faculty, and guests**

Q: *We have a photo ID program at our school, but we've heard about other schools using "smart" IDs for campus security, electronic payments and transactions, and other purposes. How could we expand our ID program into these areas, and what would be required?*

A: One of the key benefits of smart ID card solutions is that a single card can cover a full range of potential uses. With smart-encoded cards and easy-to-use software applications, any card can serve as a multi-purpose resource. It can be used to identify members of your campus community, authorized visitors, and electronically control access to your buildings and even individual classrooms, offices, and locations. Smart IDs are also ideal for providing seamless student services, processing transactions and payments electronically, verifying and accessing information, and for tracking and managing your school assets. And additional options are available in the form of wristbands that enable scanning and matching of student IDs with your information databases for a great way to manage off-campus trips and activities and retrieve information on emergency contacts and allergies and special requirements.

Potential Applications of ID Cards and Wristbands

- **Access Controls and Security**
- **Student Attendance and Staff Time Tracking**
- **Electronic Checkouts and Reservations**
- **Cashless Payments and Transactions**
- **Visitor Management**
- **Emergency Planning**
- **Self-service Student Kiosks**
- **Student Registration**
- **Documenting Allergies and Special Requirements**
- **Emergency Contacts**
- **Off-campus Trips and Activities**
- **Integration with Wireless Campus**

Of course, to implement and integrate ID cards and wristbands for these applications, you will typically need to have the right hardware and software in place. For example, for campus security, you may need to have fixed electronic scanners or readers located at building or classroom entrances, or your security staff may need to have software for reviewing and verifying identities and information when cards are scanned with handheld scanners. Or, for cashless payments in your cafeteria, you may need to have checkout hardware and software that enables scanning and electronic processing of transactions.

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At American Barcode and RFID, we can provide expertise and insights to help you choose the right solutions if you don't already have them in place. Or we can help you integrate smart ID cards with your existing hardware and software to get the full benefits, convenience, and efficiency of combining smart IDs with the features of the applications and solutions you use throughout your campus.

However, when it comes to printing and producing your smart ID cards, this is simple and easy with ID card printers. We typically recommend card printers from Zebra Technologies, a global leader in card printing, RFID tracking technologies, and wireless networking. Zebra card printers produce more than 1.5 million cards during every school and business day, in more than 90 countries. The company has extensive experience in serving K-12 schools and higher education in both public and private settings.

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With Zebra, you can choose from a broad range of printers that offer full-color and monochrome card printing. Options typically include USB, wireless, or Ethernet connectivity; smart card, magnetic strip and ultra-high frequency (UHF) RFID encoding; and lamination, card stock, and special features for higher security and card durability.

You can select from models that are ideal for higher or lower volume printing, with multiple security and encoding options to meet your specific needs. And, with card printers, it is relatively inexpensive to convert from your existing photo ID program to the use of smart IDs, and you can start with a smaller-scale integration with select hardware and applications on your campus, and then you can scale up and expand your integration with future investments. So, for example, you can print smart IDs and install fixed readers for building security and then later add more scanners to protect specific classrooms or areas of your campus. Or you can combine them with new hardware and software in your cafeteria for cashless transactions, and then you can expand into self-service checkouts with smart IDs for your school library.

Q: *We've experienced problems with some of our school's laptops, mobile devices, and other electronic equipment going missing, and it costs us a lot of money to replace them. Sometimes they end up in different classrooms or locations on our campus and it takes time and effort to find them. Is there a technology or software solution that would help us track all of our assets, find them, and protect against damages and loss?*

A: Yes, there are two primary ways that schools can implement technology and software to track and manage assets, whether they're electronic items such as laptops or other types of items such as textbooks, library books, and office equipment. Barcoding is a basic approach that can help your school track assets electronically by using barcode labels, handheld and fixed readers, and convenient software applications. And it is a perfect way to avoid the time-consuming manual labor and the potential errors involved in manual tracking systems that you may use on paper or with spreadsheets.

Barcode labels can be applied to virtually anything you want to track, and the barcode contains a unique identifying number that is matched with the same number in a database that contains all information about the labeled item. Your staff can scan these labels with handheld or fixed computers to check out items and check them in when they are returned, and handheld scanners can be used to verify items when they are found and

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located on your campus. Tracking software uses these scans to match the barcodes with information that is stored in your database, allowing your staff to quickly and automatically verify information, update it, and maintain complete records of your asset locations and usage.

However, while barcoding is the least expensive way to start automating and improving your asset tracking and management, it has some critical

limitations. One is that scanning barcodes requires line-of-sight, meaning that a person must be able to scan the barcode with a visual scanner. This means that barcoded items cannot be located or tracked remotely, from a distance. So, for example, if the item is located in a classroom, a staff member would need to find the item inside the classroom and scan it in order to verify its location and status. The other key limitation is that barcodes can only be scanned one at a time, meaning that the scanning process can be time-consuming if many items need to be scanned.

Advantages of RFID vs. Barcodes

- **RFID technology automates data collection and vastly reduces human effort and error**
- **RFID supports remote, long-range tag reading with no line-of-sight or item-by-item scans required**
- **Scanners can read multiple RFID tags simultaneously, offering huge increases in efficiency**
- **All RFID tags within range can be detected instantly and matched with information in your database**
- **Assets can be cross-referenced against assigned locations and recorded as present, missing, or relocated**
- **RFID can be integrated with active scanning for a totally automated tracking solution**
- **Available scanners support both RFID and barcoding so you can upgrade at your own pace**

If your school prefers a more fully automated solution that allows assets to be located and tracked remotely, with simultaneous scanning of multiple items and additional automation to enhance security and prevent damage and losses, the ideal alternative is radio frequency identification or RFID.

RFID technology uses radio frequency tags that are affixed to an item much like a barcode label. But the use of passive or active radio frequencies with RFID tags means that any item tagged with RFID can be scanned and located at a distance. So, for example, an item in a classroom could be scanned automatically from the hallway outside. And, rather than having to pick up or turn over a piece of equipment and scan its barcode, a user can simply wave a handheld reader within range of an item, and the device will automatically read and recognize its tag, even if the tag is located underneath the object and not visible.

Scanning distances are determined by the type of frequency, the type of RFID tag, and the hardware readers that are used. With passive scanning and entry-level handheld scanners, items can be located and scanned within 30 to 50 feet. With battery-assisted RFID tags, ranges can be extended further. And fixed readers, placed above doorways or in similar places, can be combined with radio antennas to eliminate the need for handheld scanning and provide a fully automated solution to track assets as they enter or leave particular locations.

With RFID automation, there is no possibility of human scanning errors or incorrect logging or updating of information...

RFID also offers additional frequency options and configurations for scanning ranges of up to 10,000 feet and real-time tracking of assets as they move throughout your campus. But, for most schools, passive frequency RFID tracking is the most cost-effective solution. It not only streamlines asset scanning but also eliminates the possibility of human error. Each asset is detected and identified automatically, and it is matched up with the correct information in your database using its unique ID.

With RFID automation, there is no possibility of human scanning errors or incorrect logging or updating of information on paper records or in a spreadsheet. This allows your school to maintain a completely accurate inventory of all tagged assets and properly account for current assets and future needs. And your staff can quickly locate and identify any asset virtually anywhere on your campus. Importantly, with passive RFID, tags are “woken up” when they need to be scanned, meaning that there is no continuous usage or transmission of radio waves. Scanning and radio waves are used on demand, which minimizes power usage and the need to transmit radio waves through your school.

More Technology Questions? Contact Us for a Free Consultation.

At AB&R (American Barcode and RFID), we're experts in technology solutions for private schools, with a focus on wireless networking, ID cards and printers, RFID tags and readers, and software applications. We'd be happy to provide free expert consultation to answer any of your technology questions and help you learn how private schools are using the latest wireless solutions to create safer, smarter, and more connected campus communities. We'll help you understand the latest trends in wireless technology and can help you develop a plan to keep your school at the head of the class.

Contact us today to set up a call or request an appointment. We'd love to help your school!

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