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SOLUTION OVERVIEW

LEARNING IN A MOBILE-FIRST DIGITAL ENVIRONMENT

Digital learning in primary education

It's evident that today's #GenMobile students are showing up in classrooms knowing more about technology than previous generations. They've grown up tech-savvy and prefer to do everything on mobile devices. For them, untethered digital learning is fundamental for future success.

The optimized digital classroom

Classrooms are changing. We are seeing the impact of the Digital Revolution. Learning environments are now preparing students for their future work environments. Classrooms are shifting away from rows of desks, to an environment that promotes collaboration between students, teachers and learning devices. It's what we call the Optimized Digital Classroom.

Textbooks are being swapped out for mobile devices that provide up-to-date content in real time. Printed exams are transitioning to online assessments. 1:1 and BYOD initiatives are replacing wired computer labs. Skype and Google Hangouts are fueling new study groups. And personalized learning programs are developed to meet the individual needs of each student. Technology is transforming the way we educate our children. Schools are adopting these initiatives to deliver a rich learning experience by engaging students to use the devices and applications they thrive on.

This Digital Classroom needs to support 21st Century Learning, with 1:1 initiatives and Project Based Learning. It needs to provide anytime/anywhere access to Cloud-based apps like Google Apps for Education and Office 365e. It's a classroom that easily provides guest access and encourages student collaboration, that can also prioritize critical learning apps such as Online Assessments.

As a result, IT professionals in education need to plan for the future and build a next-generation infrastructure that supports this digital learning environment and emerging technologies. The following are critical elements to help you build the optimized Digital Classroom for mobile first learning, and beyond.

User group considerations

To implement digital learning, a school must build the right infrastructure. The needs of three different user groups should be considered.

- For students, access to digital learning tools must be fast and easy. The network infrastructure needs to be robust and reliable. While students are taking an exam or submitting an essay online, technology can't get in the way. The Wi-Fi used throughout the school needs to be enterprise-grade and stable.
- The second group are teachers. They need in-classroom technology to be easy and transparent. While students are engaging with their mobile devices, teachers need to maintain control of the classroom. They also need digital tools to enable roll calling, messaging with students and monitoring what students are doing during an exam. The new technology infrastructure must be automated and problem-free – so teachers can maximize their time interacting with students, and not troubleshooting technology.
- Administrators are the third piece of the mobile-first experience in education. All school districts operate on tight budgets, so administrators need to manage capital and operational expenses very carefully. They need access to analytical data that provides real-time feedback that justifies technology spending. They can only support investing in digital learning if it improves student achievement. And it can't break the patience of technical staff that must support it.

BUILDING A ROBUST WI-FI INFRASTRUCTURE

Constructing an intelligent Wi-Fi infrastructure

Providing a mobile-first experience ensures that the students have anytime/anywhere access for uninterrupted learning; whether it's on a school-issued device or a student's own personal device. Which means you'll need a Wi-Fi infrastructure that can support the demand of mobile devices along with the bandwidth-hungry applications running on them. There are several things you can do to prepare for this:

- Plan to support 3-4 mobile devices per student, teacher devices, wireless printers, and other wireless equipment in the classroom. That means, in a classroom of 30 students, about 100 devices will connect to the network.
- Assess classroom application needs by collaborating with teachers to support a rich multimedia curriculum. For example, HD-quality video streaming requires 4 Mbps and some interactive learning games require up to 1 Mbps of bandwidth per user.
- Ensure high performance and connectivity through smart, dynamic access point (AP) technology; capable of prioritizing critical learning and testing applications over other apps, while blocking inappropriate content.
- Setup a policy management system that can implement enterprise-wide policies, strong security and an enhanced user experience for authenticated users and guests, with little to no touch.

Constructing an intelligent wired infrastructure

A robust Wi-Fi deployment starts with a wired infrastructure. Connectivity is only as good as its foundation – and not every device is built to transmit at the same speed. Be sure your wired infrastructure can adapt to various Wi-Fi use cases. When planning out your wired network, consider the following:

- Plan to support multiple data drops per classroom; access point, projector, telephone and other wired devices.
- Ensure growth and flexibility, investing in multi-gigabit access solutions that can increase bandwidth speeds per port on existing cabling for cost-effective and convenient network upgrades.
- Protect investment in wired infrastructure with switches that can scale in capacity and functionality, like modular and stackable switches that can take advantage of software defined networking applications.
- Manage the entire network with real-time monitoring, proactive alerts, historical reporting and fast, efficient troubleshooting.

BENEFITS AND SOLUTIONS FOR EDUCATION

ARUBA SOLUTION PORTFOLIO

	Administrative Office	Campus
Switches	Aruba 5400R	Aruba 3810 or Aruba 2920
Wireless Access Points	Aruba 215 or 320 APs	Aruba 205 or 215 APs (classroom) Aruba 320 APs (lecture hall) Aruba 270 APs (outdoor)
WLAN Controller	On-Premise – Aruba 7200 Cloud-based – Aruba Central Controllerless – Aruba Instant	
Security	Aruba ClearPass Policy Enforcement Firewall (PEF) RF Protect	
Network Management	Aruba AirWave	
Mobile Engagement	Meridian with Aruba Beacons and Sensors	
Software Defined Networking	HPE SDN App Store 25+ Apps Available	

Deploy a wired network capable of supporting multi-gigabit capacity

To mobilize your wired network, it's important to avoid creating bottlenecks to your access switches. It's also important to anticipate how you'll modernize and support network and IP services as hundreds more mobile devices wirelessly connect at every school, without having to upgrade your wired infrastructure at every turn.

Solution: Deploy Aruba 3810 or 5400R switches that support the latest APs with PoE+ SmartRate multi-gigabit Ethernet. This unleashes the full potential of gigabit Wi-Fi, and sets up the learning environment for success as future technologies and mobile devices are developed and used. Learn more about Aruba's Multi-gigabit Ethernet Switches.

Deploy a flexible wireless network with investment protection

When choosing to invest in a WLAN infrastructure, schools need to make smart financial decisions. Select a networking solution that can accommodate growth and change, without having to rip and replace. Needs within a school can quickly change, as 1:1 and BYOD initiatives are enacted. The network must be able to adapt. A rigid WLAN that is cheap to buy could end up breaking the bank if it can't adapt.

Solution: Aruba offers controllerless and controller-managed Wi-Fi with public cloud, private cloud and on-premises management. You're not locked into one architecture, so when your needs change, you keep 100% of your investment. At any time, Aruba Instant APs can easily convert to controller- managed mode, enabling you to mix and match the right solution for the right location – district office, school site or remote location. Learn more about Aruba's Enterprise-grade Access Points.

Ensure devices connect to the best AP

Students and their devices are mobile; moving throughout the school campus during the school day. Often, those clients get "sticky" and try to stay attached to the first AP it connects to, even if there is a better AP around the corner.

Solution: WLANs with built-in RF management technology can get rid of sticky clients by gathering session performance metrics from devices and using this information to steer them to the best AP and radio. ArubaOS is built into every Aruba AP, and solves this problem for you with ClientMatch. Learn more about Aruba's patented ClientMatch™ technology.

Ensure safe and secure digital learning environment

Teachers and students are increasingly using video, gaming and even social media to enrich learning and collaboration. This potentially exposes them to malicious and/or inappropriate content. These bandwidth-hungry applications and increased traffic on the network can also interrupt critical learning times, like when students are taking online assessments.

Solution: IT Departments need a reliable network with smart application handling to prioritize critical learning applications over other apps. With unprecedented visibility, AppRF™ technology in the Policy Enforcement Firewall leverages deep packet inspection to classify over 1,500 enterprise apps – and features a policy wizard to block, prioritize and limit bandwidth for any app or groups of apps. Learn more about Aruba's Policy Enforcement Firewall, with AppRF.

Support BYOD and 1:1 initiatives with confidence

Students, teachers, staff, and guests connecting to the school network with a variety of personal devices create a tough challenge for IT. How do you authenticate users while providing Wi-Fi access to these devices, and keep the network secure with limited IT resources?

Solution: It is important that you do not sacrifice the security of your network, while trying to make it easy to onboard devices, users and guests. Aruba ClearPass simplifies device onboarding with self-enrollment and grants network access privileges based on user roles, device types and location. Learn how Goddard Public Schools onboarded 5,500 students.

Simplify network management

Despite limited IT resources, you can keep multi-vendor digital classrooms running by looking beyond traditional network management for a simpler and more cost-effective solution. Opt for an integrated management solution rather than multiple, siloed point-products that solve only one or two management issues.

Solutions: Aruba AirWave is a multivendor network management solution for a complex network infrastructure. Be assured that your solution of choice allows you to manage multiple generations of wired and wireless networking equipment from multiple vendors through a single, centralized pane of glass. Learn how Fairfax County Public Schools centrally manages Wi-Fi at 238 locations.

Leverage low-cost technologies

Schools everywhere are exploring network-shared devices like Apple TVs as low-cost alternatives to traditional projectors. However, it's important to consider how they can be securely deployed on your network. This allows teachers to grant students access to present their project to the class, while minimizing the risk of hijacking the device and sharing inappropriate content.

Solution: Choose an access management solution that securely enables network-based AV services over the air and allows you to enforce policy-controlled access. Look for a solution that lets you control which AirPlay and AirPrint devices are visible to teachers, students and staff. This visibility should be based on a user's role, location and what device they're using. See how Fraser Public Schools included Apple TVs in their 21st Century learning environment.

Engage with students and keep them safe

Students are tech savvy. And as they become older, it is rare to find one who does not own a smart phone/device. Student-owned devices can be leveraged to engage them for non-academic use cases such as indoor wayfinding and location tracking. As improving campus security becomes front and center, engaging with students on their smart devices can help improve campus safety.

Solution: Aruba Beacons, Aruba Sensors, and the Meridian App can provide school systems a complete solution for mobile engagement for the campus. Beacons placed across the campus find registered mobile devices and allow for students to interact with customized wayfinding applications built by Meridian. Additionally, these technologies give campus administration the ability to see where students are located and send push notifications to students in all or specific locations. Learn more about Aruba's Mobile Engagement Solutions.

CONCLUSION

With the right network infrastructure planning, you can empower teachers and students to leverage the latest technology in devices and applications for a richer learning experience while streamlining IT operations across campus.

Summary of Aruba recommendations for a mobile-first learning environment:

- Build a solid wired network infrastructure with SmartRate multi-gigabit Ethernet switches that can accommodate growth and future applications.
- Deploy 802.11ac Access Points to address device density and rich applications.
- Prioritize traffic on the network for a reliable and controlled digital learning experience.
- Protect students from malicious applications with context-based controls to enforce application-layer security and prioritization.
- Streamline BYOD initiatives by having users enroll their own mobile devices.
- Secure network resources by granting network access privileges based on user roles, device types and location.
- Simplify network management and migrate toward a mobile-first infrastructure.
- Strengthen the security of low-cost technology products in classrooms using policy-based access controls.
- Utilize beacon technology to provide automated attendance, location-based notifications and analytics to keep students safe and engaged.

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