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FIVE WAYS TO ENSURE ALWAYS-ON CONNECTIVITY ACROSS THE CAMPUS

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Five Ways to Ensure Always-on Connectivity across the Campus

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Colleges and universities face steep challenges in maintaining pervasive and secure networks. There are a number of factors at work. Students bring an increasing number of devices to school—now averaging seven or more. And they expect high-speed, uninterrupted connectivity everywhere on campus; including classrooms, common areas, residence halls, and sports venues. Higher education institutions also have a long tradition of open networks to foster education and collaboration, yet must keep them secure in an age of increasing attacks.

Despite all these factors, the quality of an institution's network has never been

more important. Studies show students and parents consider a college's technological sophistication, including the caliber of its networking coverage, as critical when selecting a school.

To ensure seamless, high-density coverage across campus, IT leaders need to stay on top of the latest networking innovations and solutions. One way to do that is to work with a network vendor who has the solutions to be proactive versus reactive, ensuring reliable and secure connections both inside and outside the classroom. Here are five key points for higher education institutions to consider when designing or enhancing their campus networks.

1. PROVIDE AN IMPROVED USER EXPERIENCE

Complex wired and wireless networks are common on college campuses, and often include highly concentrated areas and heavy usage patterns. IT organizations need to optimize how data, voice, and video applications are performing across the entire campus; including local and remote locations. Despite myriad network monitoring tools, it's often difficult to know the status of the direct user experience. Many tools report on the efficiency of the wireless network's access points, traffic levels, and the number of users, but getting information on how users are experiencing the network is challenging.

There are tools to help network admins quantify the user experience. Aruba's acquisition of Rasa adds to their portfolio by delivering analytics, gained from machine learning and insights, to help move managers beyond simply monitoring performance and network speeds to optimizing the network for improved performance and user experiences. This ensures that when a student is accessing a given application, for example, or is inside a classroom, the session is optimized for the traffic type and location.



Aruba's network analytics solutions target connectivity and standard network parameters, as well as end user metrics. The goal of Aruba's machine learning-based analytics is to listen, learn, and adapt to student, faculty, staff, and visitor usage patterns for continuous insight and configuration fine-tuning guidance.

Demands on campus networks, and wireless networks in particular, will only continue to grow as more content is streamed into classrooms and residence halls.

2. DETECT, CONTROL, AND RESPOND TO SECURITY THREATS

Knowing what is on your network is critical to managing security threats. Network visibility and well thought-out policy management is essential for tracking and managing users and devices on the network. Aruba ClearPass provides intelligent and adaptable policy management for monitoring students, faculty, staff, guests, and Internet of Things (IoT) devices, such as entry doors and building security devices. ClearPass detects new devices, profiles them, monitors them, and responds to issues to minimize breaches.

But network security is increasingly expanding beyond typical network edge protection, such as firewalls and passwords, to encompass additional solutions that work within the network, such as user and entity behavior analytics (UEBA). With UEBA, network managers can use analytics to detect anomalous behavior more quickly and

intervene more effectively.

Aruba IntroSpect uses advanced machine learning and UEBA for cutting edge attack detection and prevention. With a combination of supervised and unsupervised machine learning models, IntroSpect looks at both user and entity behavior to alert network managers to attacks that have evaded other defenses.

es. It also provides immediate response to attacks before they can damage the network. Aruba ClearPass works with IntroSpect to offer intelligent and adaptable policy management.

3. ENSURE NETWORK INTEGRATES AND IS CUSTOMIZABLE

Demands on campus networks, and wireless networks in particular, will only continue to grow as more content is streamed into classrooms and residence halls. The IoT and the adoption of 5G technology, among other things, will continue to strain network bandwidth demands and no one vendor can do it alone. It's critical to work with a network vendor that is innovating and is third-party friendly to ensure secure access and always-on connectivity with a proven track record in the wireless space.

Recognizing the importance of integration with other vendors, Aruba AirWave network management solution works on-premises to give granular insight and manage both Aruba solutions

and other network products. Aruba's ClearPass and IntroSpect offer open, multi-vendor integration with more than 100 partners as well as being able to pull context from third-party systems to strengthen network policies. Aruba's Mobile First Architecture is software defined and API friendly, enabling the programmability and flexibility every campus needs to customize the network to operate as they see fit.

4. LEVERAGE NETWORK AUTOMATION

With network expertise at a premium, every higher education institution faces the challenge of making the best use of its highly skilled network administrators. Using high-end tools for network optimization can help free them from more basic network tuning chores and enable them to focus on more significant issues, such as introducing voice over Wi-Fi or deploying a new video-based learning application.

Aruba's Wi-Fi access points are designed to operate in controller-based or controller-less modes. With Aruba's latest operating system, ArubaOS 8, there are options for built-in intelligence to ensure connectivity isn't lost during a controller failure. Instead user sessions are shifted to another controller. During times of high usage, controllers load balance by distributing user sessions and access points among controllers. Aruba ClientMatch ensures the user connects to the best access point while AirMatch tunes access points to work best in the kinds of "noisy" or high-density environments common on campus. Also, ArubaOS 8's live upgrade feature allows for software upgrades without shutting down the network.

Working in conjunction with AirWave, Aruba Clarity can proactively test the quality of network connectivity services, determining if an issue is really a Wi-Fi issue or if it is with some other network device. Instead of waiting for users to report issues, Clarity can set thresholds and alerts before things escalate.

5. SECURE WIRED PORTS TO SUPPORT MOBILITY

Campuses need to upgrade their wired infrastructure to support increasing amount of student activity. Students have multiple devices and are accessing increasingly complex services that strain WLAN infrastructure capacity.

Aruba switches include Smart Rate.

Smart Rate is multi-gigabit Ethernet technology that can help campus networks get around bandwidth bottlenecks. Instead of simply replacing and upgrading twisted-pair cabling, Aruba Smart Rate uses existing cabling infrastructure. This approach both protects investments and simplifies later upgrades. Aruba has extended Smart Rate technology to their newest Wave 2 APs for even better performance in high-density environments such as lecture halls or sporting venues. Campus IT staff can easily manage Aruba Smart Rate access switches and core switches from traditional network management wireless tools such as AirWave.

Campus environments can use

Aruba switches to improve security. No longer does one switch port provide one connection. Each port needs to be even more reliable and secure than ever before. Dynamic segmentation, or per-user tunnel node, allows for setting the appropriate security posture for the user or device versus the old way of basing permissions based on the port. So whether the user or device is connected wirelessly or wired and regardless of the port on the switch through which the traffic flows, ClearPass authenticates the user or device. It then assigns a role, passes it to the switch where the traffic will then tunnel back to the appropriate controller where the full policy enforcement firewall will apply. This happens seamlessly and is important in an age of hundreds of thousands of authentications a day and IoT devices without built-in security software.

Core switches can also play a role in security and always-on experiences. The Aruba 8400 Core Switch Series extends intelligence from the edge of the network where the users are, all the way into the core. The switch uses the new ArubaOS-CX software and automates visibility for early detection of issues, and allows for customizable programmability for faster resolution of issues. The built-in Network Analytics Engine (NAE) monitors the network 24 hours a day and provides historical trends and insights on how to fix issues.

GO BEYOND NETWORK MANAGEMENT WITH ANALYTICS

In the world of network management, it's common to use network management tools. These generate and display data in a dashboard format that help network administrators easily determine the cause of disruptions and outages, and to resolve those problems. Unfortunately, that information can seldom be reused in any meaningful way to prevent the same problem from happening again.

As campus networks become larger, more pervasive, and more complex, reacting to problems after they occur is no longer sufficient. Network managers need tools to help anticipate issues ahead of time. "You need to find these problems before they have a big impact on the student's experience on the network," says Sujatha Mandava, product manager for Aruba's network analytics portfolio.

Aruba's machine learning solution, acquired from Rasa, is different because it goes beyond what standard network management tools can deliver. Network managers can now collect information from different network infrastructure devices and services on the wireless network, then use models and machine learning algorithms to display insights before problems occur. "The analysis can tell you, here are the things that you need to address," she says.

College network administrators often must deal with challenges inherent to old buildings, thick walls that block signals, and extreme high-use areas like auditoriums. To help with network design, Aruba's network analytics solution is designed suggest ways to optimize wireless deployments in specific buildings or areas, drawing on a database of information from similar implementations elsewhere. "The solution can tell you, hey, here are some areas where your peers with a similar situation were having problems," says Mandava.

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