

CASE STUDY

# CUTTING THE CORD BY MOVING TO .11AC SAVES WEST CHESTER OVER \$1M

West Chester University creates an all-wireless environment using Aruba Networks Wireless LAN, including ClearPass and AirWave, to deliver high-performance Gigabit Wi-Fi to student residences and saves over a million dollars on infrastructure costs.



When the majority of students started bringing Wi-Fi routers with them to campus, the resulting interference in West Chester University student housing facilities became overwhelming. That's when Richard Chan knew it was time to cut the cord.

"For several years we supported students who wished to plug their own routers into our wired residence hall ports," explains Chan, Assistant Director of Networking and Telecommunications for the 16,000-student institution based in West Chester, Pennsylvania, and the largest university in the 14-school State System of Higher Education

"Students have come to rely on wireless connectivity for course-work related Internet and email access, plus additional online courses and distance learning," adds Chan. "In addition, they use wireless for social media and HD video streaming like Netflix."

BENEFITS

- Pervasive, scalable Aruba 802.11ac Wi-Fi, with ClientMatch, provides all-wireless residences for over 50,000 unique devices.
- Saved \$1M on wired infrastructure costs and cut 100 metric tons of carbon emissions.
- Aruba ClearPass, including QuickConnect, Policy Manager, OnGuard, and Guest, provides a secure wireless environment.
- AirWave centralizes network optimization and management of residence, academic, research and administrative Wi-Fi systems.
- Aruba Mobility Access Switches enable unified access architecture for streamlined wireless and wired networking.



**"Our enterprise, scalable, 802.11ac-enabled WLAN, with ClearPass for security and AirWave for performance, enables us to provide our students with a wire-free residence life environment."**

**Richard Chan**

Assistant Director of Networking and Telecommunications,  
West Chester University of Pennsylvania

“However,” he continues, “when student routers became too prevalent, we reached a tipping point. Our help desk calls exploded because interference was preventing many individuals from using their Wi-Fi.”

With his #GenMobile student body clamoring for a fix, Chan began considering the advantages of the latest standard for Wi-Fi access points (APs), IEEE 802.11ac, commonly known as Gigabit Wi-Fi. #GenMobile is a today's generation of tech-savvy users who rely on their mobile devices for every aspect of communication and entertainment — educational, professional and personal.

### All-wireless 802.11ac for Cost Savings and Sustainability Benefits

“With the advent of Gigabit Wi-Fi, we proposed an all-wireless enterprise solution that leveraged the 802.11ac standard to deliver the coverage, capacity and performance we needed,” says Chan.

“Then,” he adds, “instead of upgrading existing wired LAN ports in existing residences, we could remove them. And, for our eight new, state-of-the-art residences, we could pursue a wireless-only model from the start.”

In all, an all-wireless plan provided a total savings of over a million dollars on related wired infrastructure costs.

In addition, decreases in electrical consumption and wired switch cooling costs offered significant reductions in the environmental impact of student residence facilities, matching the institutions larger sustainability initiatives and goals. “Across the eight new structures alone, we estimated our carbon emissions reduction at over 100 metric tons,” Chan says.

### PERFORMANCE + SECURITY + Pervasiveness = Aruba

With approximately 5,000 students living in the university-owned and affiliated residence buildings, West Chester elected to overhaul many of those buildings by installing Gigabit Wi-Fi. Other affiliated residence structures have been scheduled for installation in summer 2015.

A few of the residence halls had recently been converted to wireless using the prior Wi-Fi standard, IEEE 802.11n, APs from Aruba Networks during a deployment that also spanned all academic and administrative buildings.



Further, West Chester desired all nodes, regardless of which IEEE standard, on the envisioned residence life WLAN to be managed as a single enterprise system. Therefore, success not only relied on selecting the best enterprise 802.11ac-enabled APs, but also upon deploying robust management tools to run the extensive network effectively and securely.

“Like any teaching institution, our primary focus is educating students in a secure environment,” says Chan. “So, we needed the management tools to minimize the effort required to maintain a high-performance, pervasive and secure campus Wi-Fi network.”

### Positive Relationship Puts Aruba at the Head of the Class

Due to the university's positive experience with Aruba Networks 802.11n solutions, West Chester again tapped Aruba to help it create the desired residence life environment. This included enterprise solutions for both hardware and management software.

To create robust and resilient network, West Chester teamed up with Aruba on a Pico Cell design to blanket student residences with over 1000 Aruba indoor and outdoor APs. West Chester also turned to a local partner, CommSolutions of Malvern, Pennsylvania, for various implementation, project management and verification tasks.

## ARUBA'S BUILT-IN CLIENTMATCH AND APPRF INTELLIGENCE PROVIDES SUPERIOR EXPERIENCES

By using Aruba's 802.11ac-enabled APs West Chester not only gains wire-speed bandwidth, but also benefits from unique, built-in Aruba intelligence features, including patented ClientMatch™ and a next generation mobility firewall with AppRF™ that classifies and prioritizes network traffic using self-optimizing technology.

### Seamless Hand-offs with Aruba ClientMatch

Aruba's ClientMatch intelligently pairs wireless devices with the best available AP. In a nutshell, ClientMatch prevents "sticky clients" by continuously gathering performance information from mobile devices and using it to intelligently steer each device to the best specific AP based on signal strength, traffic load and connection type.

With ClientMatch, overall Wi-Fi network performance and user experiences are improved by ensuring individuals can move seamlessly between locations served by the Wi-Fi network.

### Policy-Based Aruba AppRF Self-Optimizes Network Performance

Aruba's AppRF technology continuously evaluates mobile app usage and performance on a wireless network. Then, AppRF automatically makes real-time network configuration adjustments to provide optimal bandwidth, priority and network paths based on user-centric policies. This ensures critical apps have priority and maximize available Wi-Fi resources.

By setting a policy in the intuitive AppRF dashboard, West Chester can limit bandwidth for streaming video from specific apps for specific groups of users. Just as easily, all streaming video apps can be rate limited across all users to ensure first priority is given to academic related apps.

## UNIFYING NETWORKS WITH ARUBA MOBILITY ACCESS SWITCHES

Additionally, West Chester deployed several hundred Aruba Mobility Access Switches to unify its wireless and wired network.

“ We saved over a million dollars on wired infrastructure costs ”

As a key component of its Mobility-Defined Networks architecture, Aruba's Mobility Access Switches enable organizations like West Chester to extend the role-based user access, security functions and operational simplicity available in its wireless network to its wired network as well.

### Speedy Troubleshooting Boosts WLAN Reliability and Performance

By deploying a unified access layer with Aruba, networking issues can be resolved much faster. This contributes to boosting wired and wireless network performance and reliability.

For example, troubleshooting can take less time because West Chester can determine a problem's location from the central unified access console and, in many cases, resolve it from the same centralized console.

"Improving performance and reliability, while achieving efficiencies, are critical goals for us," says Chan. "Unifying our access layer with Aruba's Mobility Access Switches definitely helps us achieve those goals."

## TAKING A CLEARPASS TO SECURITY

For Wi-Fi security, West Chester selected Aruba's scalable, vendor-agnostic ClearPass Access Management System, with the Guest, OnGuard, Policy Manager and QuickConnect modules.

By using ClearPass to replace a legacy AAA solution, West Chester gains the robust security features of a wired network in a wireless environment. In a nutshell, ClearPass combines context-based policy management with next-generation AAA (Authentication, Authorization, and Accounting) services for secure #GenMobile connectivity.

Such capabilities assist organizations like West Chester with comprehensively managing network policies, onboarding and managing devices securely and admitting guest users — all from a single platform.

Given the proliferation of mobile devices and apps for educational and other purposes, West Chester leaders recognize network protection is more important than ever. “ClearPass is critical for validating devices and users so that we can ensure secure access,” says Chan.

### **Automating Over 50,000 Device Configurations Securely with QuickConnect and OnGuard**

With over 50,000 unique mobile devices on its network prior to going all-wireless, West Chester anticipated that number would mushroom as students engaged with the new infrastructure.

To get such large volumes of devices connected and configured efficiently, West Chester adopted the ClearPass QuickConnect module. With QuickConnect, West Chester can provide students the ability to configure their own devices for secure access without involving IT, dramatically freeing up IT resources over manual configuration with legacy AAA solutions.

Additionally, West Chester is deploying ClearPass OnGuard for advance security posture assessments. OnGuard enables organizations to automatically check every computing device that connects, regardless of ownership or type, to ensure it meets security compliance requirements. Devices failing to comply can be redirected for remediation.

### **Policy-based Management Improves Academic Application Performance**

In addition to basing policies on user roles, ClearPass provides organizations with the ability to utilize contextual attributes for controlling network traffic priority. This ensures wireless activities related to teaching and learning aren't competing with off-hours endeavors.

At West Chester, this means students are permitted to connect a range of Wi-Fi devices without intruding upon academic applications. These same devices are not permitted on the academic network based on their device profile.

“We created a guest network for non-academic devices,” says Chan. “We use ClearPass to register and onboard those devices. And, by limiting the bandwidth available to the guest network, academics and research receive priority.”

### **Combining ClearPass and Mobility Access Switches for Complete Role-Based Connectivity**

Organizations like West Chester also appreciate the power of combining Aruba's mobility access switches with ClearPass. This enables institutions to become completely role-based. As a result, users have the same role no matter what device they use – whether institution-owned or BYOD, where the device connects or which type of connection is used – wired or wireless.

In the case of West Chester, this means a context-aware role-based strategy can be deployed in the all-wireless residence halls as well as academic and administration buildings, where both wired and wireless access is available.

### **GRANULAR, CRITICAL INSIGHTS WITH ARUBA AIRWAVE**

For ensuring the overall health of its WLAN, West Chester deployed another scalable, vendor-agnostic Aruba solution: AirWave Network Management.

AirWave provides West Chester with critical and granular visibility into their entire Wi-Fi network and underlying wired infrastructure. This includes real-time and historical information on types of devices logging on, the specific access points devices are connected to and the total number of devices on the network.

### **Enabling Operational Improvements Via Total Visibility and Control, Regardless of Device Type**

With AirWave, West Chester enjoys a map-like interface, which provides a visual representation of each AP, and its location, at every facility. This visualization includes the number of users connected to a specific AP and whether they're using an institution-owned or BYOD device. Such capabilities assist with diagnosing issues as well as planning for where APs are needed – or whether other steps should be taken – to maximize performance.

In addition, AirWave's VisualRF™ feature not only provides current and historical device information, but also reports on applications and their performance. With such visibility, problems that previously took hours to resolve can be done in minutes. This provides substantial savings through operational efficiency, reduced downtime and consolidated management toolsets.

### Pinpointing Interference Sources Speeds Resolution

AirWave also provides an unprecedented view into sources of signal interference. Like any institution, West Chester has a range of devices on campus that can cause interference, including Bluetooth gear, microwave ovens, and more. With AirWave, IT staff can visually see the sources of interference, enabling mobile devices to be moved automatically to a cleaner channel.

“AirWave definitely assists our help desk with troubleshooting interference and other reported issues,” affirms Chan.

### Combining AirWave with AppRF Enables End-to-End UC View

To assist institutions like West Chester with future transitions to unified communications, combining AirWave and Aruba’s built-in AppRF provides a consolidated dashboard for viewing network health and app performance.

Only Aruba provides an end-to-end view of UC, making it easier to quickly identify issues and isolate problems to help ensure UC sessions achieve optimal performance.

### ARUBA GIGABIT WI-FI PROVIDES SIGNIFICANT PERFORMANCE GAINS

To ensure a smooth rollout of its new 802.11ac wireless network, West Chester initially conducted a pilot with about 100 students in a three-story building, which revealed gains for all mobile devices, both new and old.

The enhanced design of the 802.11ac APs ensures that throughput is maximized for each device, regardless of type.

“We’ve seen significantly improved performance even for 802.11n-enabled devices,” says Chan.

### Aruba WLAN Assists with Enrollment Growth Goals

Beyond student residence life needs, West Chester’s new Gigabit WLAN is assisting with other critical institutional goals. “We’ve undertaken an enrollment growth initiative,” explains Chan.

“The new residence life wireless network is enabling more online education,” he continues. “This permits students to pursue a blended approach — they can take some traditional classroom courses and some online courses.”

### Expanding to an All-Wireless Institution

What’s more, the success of the residence life deployment is also helping West Chester test drive wire-free environments prior to pursuing a similar strategy institution-wide.

“The residence life project is giving us the confidence to review the potential of an all-wireless enterprise,” Chan says.

### ABOUT ARUBA NETWORKS, INC.

Aruba Networks (NASDAQ:ARUN) is a leading provider of next-generation network access solutions for the mobile enterprise. The company designs and delivers Mobility-Defined Networks that empower IT departments and #GenMobile, a new generation of tech-savvy users who rely on their mobile devices for every aspect of work and personal communication.

To create a mobility experience that #GenMobile and IT can rely upon, Aruba Mobility-Defined Networks™ automate infrastructure-wide performance optimization and trigger security actions that used to require manual IT intervention. The results are dramatically improved productivity and lower operational costs.

Based in Sunnyvale, California, Aruba has operations throughout the Americas, Europe, Middle East, Africa and Asia Pacific regions.

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1344 CROSSMAN AVE | SUNNYVALE, CA 94089  
1.866.55.ARUBA | T: 1.408.227.4500 | FAX: 1.408.227.4550 | [INFO@ARUBANETWORKS.COM](mailto:INFO@ARUBANETWORKS.COM)