# AirWave™ Solution Guide

Local area networks were designed to connect enterprise users sitting at their desks to servers located in a nearby data center. In today's dynamic, distributed enterprise, users have moved away from their desktops. They use multiple mobile devices to connect to the network on campus, in branch offices, at home and on the road. Their applications run not only on servers elsewhere in the building, but also data centers hundreds of miles away and in the cloud. To support these demanding mobile users, IT professionals are rearchitecting their networks, using new wireless technologies like 802.11n to deliver mobility while reducing the cost of the network infrastructure.

The consequences of downtime are significant. Downtime impacts worker productivity. And it increases the support burden for everyone in IT, from the network engineers responsible for managing the infrastructure to the service desk staff who answer the phone when users experience connectivity problems.

Too often, network operations departments are struggle to manage their mission-critical wireless networks with tools designed for the static wired networks of the 1990s or with proprietary wireless element management systems designed by hardware vendors. The fundamental problem is that today's mobile users break yesterday's port-based network management models. Traditional element management systems were never designed to answer the question critical to operating networks for mobile users: Who is connected? Where are they located? What devices are they using, with what drivers and operating system patches? Are they properly authenticated? What's happening in the RF environment? How much bandwidth is available and how much is being used?
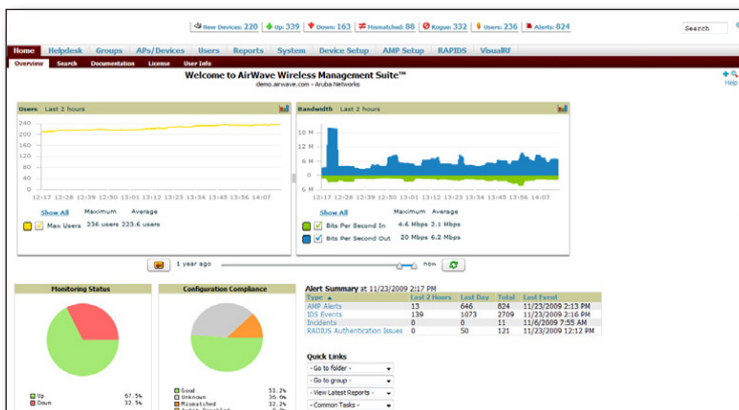
AirWave provides each staff member access to a web-based dashboard with viewing rights and administrative privileges tailored to his or her job responsibilities.

The Aruba Advantage

A Better User Experience
AirWave has been designed from the ground up as an operations solution for the whole IT organization, from the service desk, to the NOC, to network engineering. Each team member has role-based access to relevant information, and it's usually just a click or two away.

User-Centric Management
AirWave gives you a single, accurate picture of everything that affects service quality for your users — from wired infrastructure, to the RF environment, to individual mobile devices. It also integrates easily with existing IT service management tools for more efficient problem resolution.

Intelligence for Better Decision-Making
AirWave provides a wide range of actionable information, from time-sensitive alerts to historical reporting. With data that spans days, months and seasons, you always have what you need to spot trends, plan capacity, and craft the right strategies for your organization.

Multi-Vendor, Multi-Architecture, Multi-Generational
Even in multi-vendor networks and mixed architectures with multiple generations of products, you have a single view to monitor and manage your entire network.

Using outdated tools to manage wireless networks leads to predictable results: frequent escalations of routine issues to scarce network engineering resources, poor network performance and rapidly increasing support costs. With thousands of new wireless users and whole new categories of wireless devices coming online — VoIP phones, printers, handhelds, asset tags and more — the problem is getting worse every day.

To support a mission-critical wireless network and a mobile user population without adding substantial IT headcount, you need a new approach to network management — an approach supported by intelligent, user-centric management tools designed specifically to address the unique requirements of a mobile world. You must be able to delegate responsibility across the IT organization — letting the service desk troubleshoot routine issues so that network engineering staff can work on the most difficult and important problems.

AirWave delivers operational efficiency for teams managing rapidly changing networks and supporting mobile users who connect via the wireless LAN as well as wired Ethernet ports. With its easy-to-use interface and user-centric approach, AirWave lets your service desk triage connectivity issues while your valuable network engineering staff focuses on more strategic work. You also get a simpler way to enforce policies and actionable information that lets you plan for the future. The multi-vendor AirWave eliminates the need for separate management tools for each vendor's hardware. AirWave even supports multiple generations of products from these vendors, from fat APs to thin, from legacy 802.11b to the newest 802.11n devices.

With AirWave, you save time and money, improve service quality for your users and make better decisions about your network. That's why leading Fortune 500 corporations, service providers, universities, school districts, healthcare organizations and retailers across the world use AirWave solutions to manage and control their Aruba, Cisco, Enterasys, Foundry, HP ProCurve, Meru, Motorola, Trapeze, Tropos and other WLAN infrastructure devices.

AirWave is available in multiple versions, whether you have 50 access points from a single vendor or 50,000 Wi-Fi, mesh and wired devices from a variety of different providers.

AirWave Benefits

- Save time
- Save money
- Improve service quality
- Make better decisions about your wireless network

AirWave Features

- AirWave Management Platform
- VisualRF
- RAPIDS

Optional AirWave Modules
- AirWave Master Console
- Many-to-One Failover

AirWave Benefit — Remote Monitoring and Visibility

When a user reports a problem with your wireless network, that problem can have dozens, if not hundreds, of root causes: client configuration errors; authentication issues; offline controllers or APs; WAN connectivity issues; or problems with wired ports, switches, and routers. You need timely information that you can trust to quickly identify and resolve the problem. Proprietary element management solutions are notorious for being too difficult to use for any but the most skilled and most highly trained IT staff. When management tools are only accessible to high-level network engineers, every support issue must be escalated to those engineers, creating major operational bottlenecks. No one likes the result: users are unhappy because their problems are not resolved quickly; the service desk staff becomes frustrated because they cannot do their jobs; and network engineers suffer because they are swamped with wireless-related calls.

AirWave gives your IT staff one place to go for everything that they need to diagnose and resolve user problems. Because it's so easy to use, AirWave lets your service desk staff pinpoint many problems themselves, while the user is still on the phone. When an issue is escalated, network engineering has the rich data it needs to resolve the problem. That means that your most valuable staff has much more time to do the work with the most value: solving the toughest problems and proactively improving network performance and reliability.

User and Device Monitoring

With AirWave, you can find any user or device on your wireless network with the click of a button — and see real-time monitoring views as well as relevant historical information. Special diagnostic summaries highlight anomalies and situations that may affect end-user network performance. AirWave includes monitoring views specifically designed to aggregate critical information for the service desk, as well as the high-end monitoring functions network engineers need.

"With AirWave, I can be "onsite" in a few clicks of the mouse, and can usually resolve the problem without dispatching a technician.... Instead of spending hours investigating the source of the problems, I can figure out what's wrong in minutes."

James Lersch
Network Services Engineer
Giant Eagle

Visibility into the Invisible: RF Visualization and Location Tracking

To diagnose and resolve a wireless problem, you often need to see what's really going on in the RF environment: Are too many users connected to an AP? Is the user in a dead spot? Is there interference from another device in the building? AirWave puts all of this information at your service desk's fingertips without the costs of specialized sensors or location appliances.
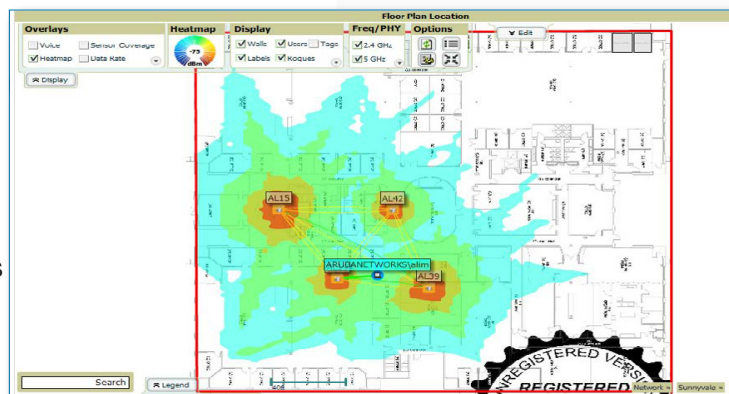
VisualRF provides IT staff with a customizable, real-time view showing signal quality, data rates, device locations, and more.

AirWave Benefit — Save Time

As the wireless network gets larger and more complex, network engineering often finds that mundane tasks, such as pushing a new vendor software release to all of the access points or controllers, consume an unacceptable amount of time. AirWave is designed to automate routine tasks and free you to pursue other, higher-priority activities.

Automated Configuration Management

AirWave from Aruba Networks makes it easy to define your configuration policies using a web-based interface or by pulling a "known good" configuration from an existing device to create a template to be applied to other devices. You can then efficiently push the appropriate configuration to a single device, a specified group of devices, or to every device on your network. AirWave's hierarchical policy definition allows you to quickly and easily update general configurations across the entire network without overwriting certain settings that may vary from location to location on your network.

Firmware Distribution

Most hardware vendors update their software and issue security patches and bug fixes several times a year. Yet, few organizations keep up with these updates, simply because the process of distributing the software across a large wireless network is so cumbersome. With AirWave, when you need to update the firmware on your WLAN devices, you simply define a "minimum acceptable" firmware version for each make and model of device. AirWave then distributes the new software to any devices with down-rev versions of software and verifies that the changes were applied successfully to every device.

Intelligent Scheduling

To minimize disruption to critical business processes, AirWave allows you to schedule configuration changes and firmware updates to occur during a specified maintenance window, often late at night when network usage is low — and to ensure that the changes occur within the appropriate window in local time. You can schedule recurring tasks to occur daily, weekly, monthly or at a custom-defined interval.

"With AirWave, the management of the wireless LAN is much less of a burden, which makes it possible for us to plan to expand our network and increase usage."
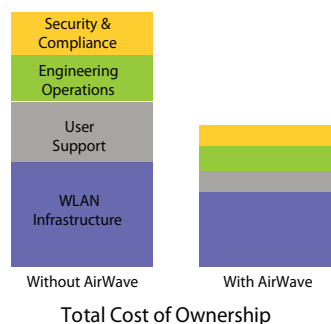
David Elliott

System Engineer
LifeWay Christian Resources

AirWave Benefit — Save Money

The true measure of any management solution is its ability to reduce network operating costs. AirWave reduces network operating costs, increases utilization rates for valuable assets, helps you invest more wisely, and extends the useful life of your existing WLAN infrastructure.

Lower User Support Costs

- Accelerated problem resolution, led by the service desk
- Greater percentage of problems resolved without escalation to valuable network engineering resources
- No need for multiple proprietary management consoles, location servers, wired infrastructure support tools and device management tools
- Lower service desk training costs by consolidating to a single, intuitive system

Security & Compliance
Engineering Operations
User Support
WLAN Infrastructure

Without AirWave   With AirWave

Total Cost of Ownership

More Efficient Network Engineers

- Time savings through automation of routine tasks such as configuration changes, firmware updates, rogue AP scans and more
- Remote diagnostics and corrective action to reduce troubleshooting time
- Less travel time to and from remote sites

Streamlined Security and Compliance Processes

- Efficient rogue detection process with fewer false-positives to investigate
- Reduced compliance management costs through automated enforcement, auditing, logging and reporting

Reduced Infrastructure Costs

- Efficient asset tracking through VisualRF to increase utilization rates for and reduce losses of valuable mobile assets
- Intelligent reports and capacity planning to help you determine exactly where you need to expand network capacity so you can invest your infrastructure budget wisely
- Intelligent lifecycle management that extends the useful life of existing WLAN infrastructure and gives you the flexibility to choose the best solution for each technology refresh

Multi-Vendor, Mixed-Architecture Support

- Multiple wireless architectures, including "thin" APs and controllers, autonomous APs, mesh networks, point-to-point bridges and even WiMax
- Leading wireless infrastructure vendors, including Aruba, Cisco, Enterasys, Foundry, HP ProCurve, Meru, Motorola, Trapeze, Tropos and others
- Multiple generations of technology, dating back to the earliest days of the wireless industry as well as the newest 802.11n products, extending the life of your earlier investments

"By using a management solution capable of supporting multiple vendors, we knew we could always select the best technologies for our needs and foster healthy competition among vendors without constantly having to replace and upgrade our entire infrastructure. Multi-vendor management permits a more affordable, incremental approach to upgrades."

Matt Fry
Senior Network Engineer
Fairfax County Public Schools

AirWave Benefit — Improve Service Quality

Unlike tools that are designed to improve manageability of a single part of the infrastructure such as controllers and APs, AirWave enables wireless network management that's centered on the user. After all, service desk calls come from people, not APs or ports. AirWave gives you a comprehensive, accurate picture of everything that affects service quality: wired infrastructure, wireless controllers and APs, client devices, and even the air itself.
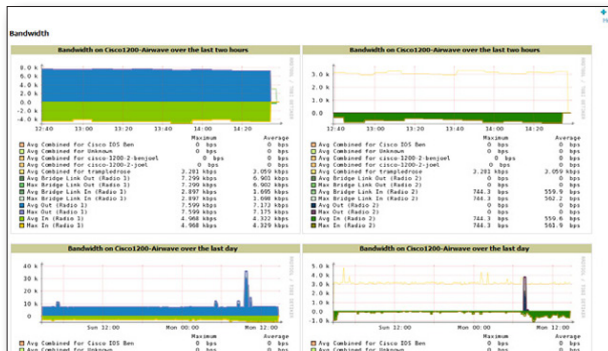
AirWave gives you a comprehensive, accurate picture of everything that affects service quality.

Full Network Visibility

AirWave's most important function is to put all the information you need at your fingertips. Navigate to an AP's monitoring page and you see exactly how many users are connected to the access point, who those users are, and how much bandwidth they are using. You can even compare current usage patterns to historical trends from the last day, week, month and year. Drill deeper and you can examine RF statistics, error rates, and quality of service data (voice traffic vs. data) to better understand the RF environment and remotely diagnose problems.

Monitoring Key Components of the Wired Infrastructure

True root cause analysis of wireless problems requires visibility to components of the wired network infrastructure that affect WLAN performance, including routers, switches, authentication servers and more. AirWave monitors wired as well as wireless infrastructure giving the service desk better insight into the overall network and allowing them to escalate to the right people once they identify errors.

Authentication Error Logs

Many of the wireless problems reported to the service desk are the direct result of a failure in the user authentication process. AirWave logs and displays RADIUS authentication errors.

Open Architecture for User-Centric Integration

AirWave provides your IT organization with valuable data, but it's not the only tool you have in place to manage service quality. That's why AirWave provides an open, XML API that enables you to integrate cost-effectively with your existing IT service management tools or even

"The AirWave Management Platform software helps make it possible to deliver a robust, reliable service to our students without overwhelming our IT staff with additional support responsibilities."

Gary Landau

*Director, Network Services
Loyola Marymount University*

build custom applications to serve your users. Any data that you can see in the AirWave user interface is accessible to you via the XML API.

Incident Tracking and Data Capture

AirWave includes incident tracking capabilities for reporting and root cause analysis. When logging or escalating incidents, the service desk can attach snapshots of relevant monitoring screens and performance data to communicate exactly what was happening at the time a problem was reported. AirWave even integrates with other tools (such as BMC Remedy) that the service desk uses to track, report and escalate user issues.

AirWave Benefit — Make Better Decisions

Without accurate data, you cannot make good decisions. Is your network engineering team spending its time working on the problems that actually affect user satisfaction? Where do you need to add capacity? Where do you have infrastructure that's not being fully utilized? How can you be sure where you'll get the highest returns on your upgrade investments now that 802.11n has been ratified?

AirWave provides a wide range of actionable information from time-sensitive alerts to historical reporting. With data that spans days, months and seasons, you always have what you need to spot trends, plan capacity, and craft the right strategies for your organization.

Real-Time Alerting

Managing a mission-critical wireless network requires you to be armed with the information you need to initiate timely responses to problems and threats — even before they affect service quality. AirWave provides an extensive set of customizable alerts that let you know immediately when the system detects potential problems. Alerts can be sent via email or via SNMP traps to another fault management system. AirWave also incorporates a number of visual displays of alerts and error conditions, all customizable on a per-user basis (e.g., an AP icon will display in red when a critical alert is active or when usage conditions exceed predefined thresholds).

Historical Trend Reporting

To assess performance and network capacity, it is not enough to look at real-time network data in isolation. You also need trend data dating back months or years to determine how current conditions compare to previous levels and how changing usage patterns may impact network performance. While proprietary management solutions may provide only a few weeks of data, AirWave gives you up to two years of actionable information, including network performance data and user roaming patterns. It also gives you the detailed capacity reports you need to plan for adequate coverage across your current network, network expansion or 802.11n upgrades.

Intelligence to Drive Proactive Improvements

AirWave gives you a systematic way to measure performance and

"It was really valuable for our stakeholders to see where the network is today compared to a year ago. And with AirWave, the picture is very clear."

Justin Hao
Network Engineer
Texas A&M University

reliability across your wireless network — both in real time and historically. What you can measure, you can improve by focusing your efforts where they will have the most significant impact.

AirWave Benefit — Security

Operations management is the missing link in many organizations' wireless security strategy — without it, you cannot truly know
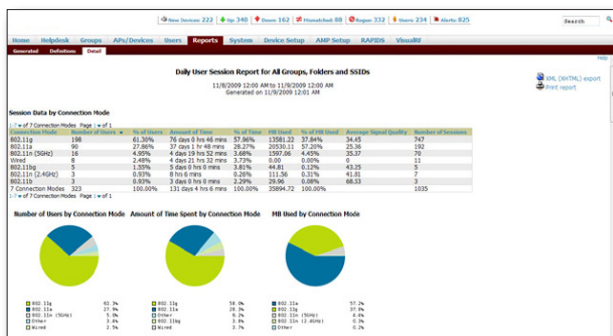
Analyzing AP usage over time allows for more effective capacity planning.

that your security policies are being implemented and enforced. With today's strict regulatory compliance standards (Sarbanes-Oxley, HIPAA, PCI and others), strong centralized wireless network management is essential to protecting your organization and its data.

User Tracking and Session History

In a secure network, you need to know exactly who is connected to your network, where they are located, and how they are authenticated. AirWave gives you precisely this level of visibility — and even allows you to see users' full roaming history so you can see when and where they have connected to your network.

Compliance Audits Configuration Policy Enforcement

Good security requires that you regularly audit all your controllers and access points to ensure that their configurations match your policies. Yet, in a large network with thousands of APs and controllers, manual configuration audits are too time-consuming and error-prone. Often, they simply do not get done. Gartner has estimated that as many as 90 percent of wireless security incidents will result from this type of improper configuration. AirWave addresses this vulnerability by automatically auditing your entire wireless infrastructure, alerting you whenever a configuration error is detected and delivering a complete report showing exactly how the configuration violates your policy.

Rogue and Intrusion Detection

Rogue access points are perhaps the next most common security threat. AirWave RAPIDS™ Rogue Detection is designed to detect unauthorized access points no matter where they are on your network — even if they are in a remote office without Wi-Fi hundreds of miles from your office. It also aggregates, correlates, alerts and logs IDS

"Policy management is critically important for security and performance. AirWave's ability to highlight any mismatched configurations is critical. I wish I had a tool like it for my switches on my wired network."

Gary Landau
Director, Network Services
Loyola Marymount University

attacks that have been reported by your infrastructure, providing a full picture of your network security.

Role-Based Administrative Access and Full Audit Logs

Good security policy dictates that only those with a "need to know" have access to your management system and to critical information about your network. Yet, in a large IT organization, literally dozens of individuals — ranging from service desk staff to your most senior network administrators — may need access to your management system to do their jobs. AirWave's role-based administrative access allows you to assign different privileges (read-only, read-write, audit-only) to each individual and to restrict their access to certain segments of the network. All actions are logged so you can tell exactly who made any change or took a specific action.

AirWave Components

AirWave Management Platform

AirWave Management Platform, the core component of AirWave, provides efficient, centralized management of your wireless infrastructure and visibility across the wired edge of your network. It communicates with and controls your wireless infrastructure via standard protocols (SNMP, HTTP, and so on) across a LAN or WAN. It provides an easy-to-use web-based interface that gives people across the IT organization a personalized view of the network with administrative privileges tailored to their specific job responsibilities.

VisualRF Location and Mapping

When you plan, troubleshoot or analyze your wireless network, a picture is worth a thousand words. AirWave VisualRF gives you an accurate view of your entire network without ever leaving your desk. It automatically generates a map of your RF environment and the underlying wired uplinks topology, showing you a full view of what your network looks like — in real time. VisualRF uses RF measurements gathered from your active wireless access points and controllers, without the need for a costly, separate location appliance. You can see exactly who is on your network, where they are, and how the network is performing.

RAPIDS Rogue Detection

AirWave RAPIDS automatically detects and locates unauthorized access points and utilizes a set of rules to highlight the most important threats to your organization. The RAPIDS software uses your existing, authorized APs to scan the RF environment for any unauthorized devices in range; it also scans your wired network to determine whether any unknown devices are connected. RAPIDS then correlates all of this data and uses a set of rules to highlight only those devices that are truly a threat to your organization, which greatly reduces false-positives and allows you to focus on the important issues. It also captures and manages IDS events. RAPIDS improves network security, manages compliance requirements, and reduces the cost of manual security efforts.

Optional Modules Available With AirWave

AirWave Master Console and Failover Servers

AirWave Master Console ensures that you can monitor even the largest wireless networks with tens of thousands of nodes from a single console. AirWave Failover Servers provide high-availability management for mission-critical wireless environments.

A Complete Solution for Any Wireless Network

AirWave is available in multiple versions depending on your network size, available resources and budget needs.

We Focus on Customer Success

Aruba Networks understands the operational challenges of the wireless enterprise, and we're here to help you succeed. With an industry-leading support team, comprehensive training offerings, and a world-class group of partners, we bring the right resources to every deployment. We work right alongside you to bring your network under management and pride ourselves on how responsive we are to our customers' needs.

About Aruba Networks

Aruba is the global leader in distributed enterprise networks. Its award-winning portfolio of campus, branch/teleworker, and mobile solutions simplify operations and secure access to all corporate applications and services - regardless of the user's device, location, or network. This dramatically improves productivity and lowers capital and operational costs.

Listed on the NASDAQ and Russell 2000® Index, Aruba is based in Sunnyvale, California, and has operations throughout the Americas, Europe, Middle East, and Asia Pacific regions. To learn more, visit Aruba at arubanetworks.com. For real-time news updates follow Aruba on twitter.com/ArubaNetworks, or greenislandnews.blogspot.com.

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