HEALTHCARE AT THE EDGE
The network you need when care matters

The challenges faced by healthcare have never been more significant than today. Due to an aging global population, regulatory demands, and provider burnout, the need for quality healthcare is undeniable. Medical science has rapidly advanced the way patient care occurs and technology has dramatically changed the way that care is delivered.

With all of these advancements, healthcare IT struggles to keep up and deliver the type of experiences required by healthcare providers and consumers. Healthcare environments require 24x7 connectivity and services translating to enormous pressure for Healthcare IT (HIT) to keep the network stable and secure. The requirement for no downtime limits their ability to adopt new technology quickly and causes them to incur massive amounts of "technical debt" in the process. With new medical care solutions arriving almost daily, the HIT network has become a risky environment to deploy new ways to care for patients. Additionally, healthcare is one of the most targeted and breached industries by cybercriminals who strongly desire electronic medical health records. The pressure on HIT to maintain a strong security posture in the face of this rapidly evolving challenge has only added more complexity and frustration to IT operations.

> " On the black market, the going rate for your social security number is 10 cents. Your credit card is worth 25 cents. But your Electronic Health Record (EHR) could be worth hundreds or even thousands of dollars. "
>
> - Forbes

Most healthcare organizations struggle to deliver simple, reliable, and secure connectivity, so Aruba created a platform to help them deliver the experience their patients and staff require. With a Unified Infrastructure, Zero-Trust Security, and AI Powered Operations (AIOps), the industry-first Aruba Edge Services Platform is designed for the unique challenges facing Healthcare. A Unified Infrastructure provides a single management source for wired, wireless, & SD-Branch to facilitate any Healthcare use case. Zero-Trust Security ensures that all medical devices, users, and things are profiled and correctly assigned network access. AIOps enable network automation and provide robust management tools for network operators.

Care Provider Experiences Matter: The first client of Healthcare IT is those who provide care to patients. Aruba improves their experience of delivering care by enabling the network to become transparent to their working world. By enabling them to bring any device, seamlessly roam across a facility, and have prioritized quality of service (QoS) on their critical applications, a care provider can begin to trust the network as a partner in care, instead of a frustrating impediment.

UNIFIED INFRASTRUCTURE

In healthcare, the network cannot go down, and even planned downtime is painful to endure. Performance of the network must also deliver a consistent experience. When a healthcare provider can rely on the network to perform at an optimal level, it increases their confidence, enabling them to focus on patient care, not on whether their device connects or not.

High-performance wireless networks

Aruba's Wi-Fi 6 technology is designed to support hundreds of healthcare devices at the same time without impacting Wi-Fi quality. Patients and staff can seamlessly roam a facility, with consistently great performance. Aruba optimizes the connection from the device to the best available access point (AP) – regardless of where the device is carried. Critical applications can be prioritized so they perform at their peak, not impacting the patient or staff experience.

The use of Aruba Mobility Conductor offers hitless failover capabilities, where the wireless network is smart enough to ensure connectivity is not impacted. The Mobility Conductor uses clusters to balance connections across your infrastructure to prevent unplanned outages from affecting end-user traffic or sessions. This is very useful for planned network upkeep. Each component of the wireless network is taken gracefully out of the data path, the upkeep performed and validated before it is returned to regular use. In short, HIT can now perform a security patch in the middle of a weekday, with no impact to all connected devices.

Using industry-leading tools like ClientMatch, Adaptive Radio Management and Aruba AIOps features, Aruba provides wireless coverage that self-optimizes the Wi-Fi client experience, self-adjusts to avoid RF interference and noise, and makes performance improvement recommendations, based on a large amount of collected baselining data.

> " Automation can help alleviate the high percentage of unplanned network downtime that is caused by human error. "
>
> - Gartner, 2019

Aruba AP's are also a platform for IoT connectivity, with integrated Bluetooth Low Energy (BLE) Beacons, Zigbee radios, and a USB port for any future connectivity needs. This multi-function connectivity platform ensures that whatever method a device needs to connect with will be available to the Health System through their Aruba platform.

Smart switches from edge to core

The wired components of the network are just as important as wireless. As mobility in healthcare is a priority, each AP that connects to a switch port has to be reliable and participate in delivering the best performance possible. Multi-gigabit switches support high density healthcare environments while easily segmenting traffic for wired medical devices, delivering enhanced performance and improving security. In addition to Smart Rate PoE, Aruba provides auto-negotiation between switch and access point to determine the needed throughput at the edge.

> *The first goal is to* **CONNECT** *every device.*

From edge to core, Aruba AOS-CX switches include software-defined intuitive management tools that are programmable with built-in analytics that help IT reduce the time spent on implementing changes and troubleshooting errors. Aruba AOS-CX core switches allow network operators to upgrade vital elements of the core OS without impacting the network that is supporting patient care or healthcare operations. A similar capability to wireless hitless failover occurs in the core of a healthcare network with a redundant pair of Aruba AOS-CX switches in Active-Active mode. Utilizing Virtual Switching Extension (VSX), traffic load is moved from one side, completing the required upkeep and validating success, before returning a balanced traffic load to the Active-Active pair. Once the first core switch completes, the process repeats for the remaining members of the core infrastructure.

With the included Network Analytics Engine (NAE), healthcare IT can see and fix problems before they impact patients, staff, or providers and automate many of the risky tasks in core networking.

Even though the software of AOS-CX is revolutionary, the actual speed of the switch also sets it apart by outperforming our competition in this space. Matching the simplicity of IT Operations that AOS-CX delivers, Aruba built this platform to lead the industry in both throughput and line speed. As more data is generated at the Edge where patient care occurs, the network must enable actionable insights to be returned quickly to care providers, which requires both simplicity and speed. Aruba AOS-CX delivers on both challenges.

ZERO-TRUST SECURITY

Although healthcare organizations are investing in cybersecurity, recent breach statistics suggest there are opportunities for improvement to stay ahead of threats. Most traditional security solutions focus on securing the perimeter by detecting known attacks and malware by their patterns or signatures. Yet, never before seen threats, mutated threats, and advanced targeted attacks can often bypass these types of traditional solutions.

> Healthcare data breaches cost $429 per record, 65% higher than other sectors, and the average number of records breached is 25,575.
>
> - Ponemon Institute, 2019

Know what is on the network

IoT devices can have many standard OS platforms, and it can be challenging to know what is on the healthcare IT network. Since a thermostat and a security camera and a medical device can all have a Linux OS platform, enforcing policy compliance becomes a very manual task. ClearPass Device Insight simplifies device onboarding using machine learning discovery methods to identify and profile a wider range of device types (care giver devices, patient devices, biomedical devices, security devices, etc.). Machine learning will also understand behavior and other contextual factors over time to help profile new devices as they come on to the network. Visibility is the first step toward security.

"Zero Trust" network access

Aruba ClearPass Policy Manager utilizes Network Access Control (NAC) to provide discovery, profiling, authentication, and authorization of users, guests, devices, and things before letting them on the network or giving them access to resources. These granular and policy-based access controls are critical to prevent cybercriminals from quickly advancing and moving laterally within seconds after gaining access to the network. Once a user or device is profiled, automated enforcement ensures that each user, guest, device, or thing only has access to the network, IT resource, or application for which they have approval and that they remain in compliance.

> The network should **PROTECT** itself through visibility, policy, and authorization.

Separate care giver, patient, and device traffic

Aruba's Dynamic Segmentation delivers the micro-segmentation needed for traffic on wired, wireless and the WAN using granular user/device/connectivity information. Policies are carried across the network end-to-end, ensuring that patient traffic is easily kept separate from medical record or payment information, regardless of the location of the user or device or the switch port carrying the traffic.

Marsh Cyber-Catalyst Designation

One of the leading vendors of Cybersecurity Insurance has recognized Aruba's Policy Enforcement Firewall (PEF) as a leading component to a Zero-Trust security environment, designating it as a "Cyber-Catalyst". For healthcare agencies that leverage Aruba PEF, they can receive a better rate on their insurance, as well as be more secure through automated policy enforcement.

AI POWERED OPERATIONS

The incredible amount of data generated at the point of patient care delivery is challenging the very fabric of network operations. While not a common point of discussion, the role of network performance has become a critical path for the delivery of care. The goal for HIT operations is to manage and deploy high-performance networking and security across all locations – clinics, hospitals, headquarters, and remote caregiver home offices. The Aruba solution delivers a single architecture that combines best-in-class wireless, wired, and WAN infrastructure, with management capabilities that include assurance and orchestration features to help IT maximize their time to meet operational goals and minimize operational costs.

Improved remote site visibility and management

Remote clinics may not have full-time IT staff available. Aruba Central provides a single pane of glass, giving complete visibility of remote sites to those at corporate headquarters. IT can remotely monitor, manage, and troubleshoot the wired, wireless, and SD-WAN infrastructure from anywhere. Aruba's SD-Branch solution offers integration capabilities across the WLAN and LAN optimized for SD-WAN, MPLS and cellular connectivity that is destined for the Internet or a healthcare data center.

> *Real-time data allows the network to* **ANALYZE** *and* **ACT** *recommend improvements.*

Simplified deployment at remote clinics

Non-technical staff can participate in the deployment of a clinic's network. This helps reduce IT headaches and gets clinics operational in the fraction of the time it would take to send a dedicated person to each site. A mobile app allows employees to barcode scan Aruba infrastructure and plug them in while configuration downloads happen automatically to get devices working.

Converge network and security operations at a lower cost

The convergence of network and security services utilizing Aruba's gateway helps to reduce your total cost of ownership. These Aruba Central cloud-managed gateways are optimized for SD-WAN using MPLS, Internet and LTE cellular connectivity to help ensure always-on performance and also include role-based access and firewall features.

AIOps for optimized performance

Aruba automatically improves network and application performance based on anonymized peer comparisons, where your network is matched to a like environment type. This includes customized recommendations that, if followed, can increase performance by 15%. Network admins that do perform the recommended software configuration changes can also see a before and after dashboard to validate the effects of the change.

With Aruba User Experience Insight, IT is able to see a real-time view of the end-user experience and apply clear steps to resolve any issues before any service ticket is even opened. These powerful tools bring much-needed help to enable already overwhelmed IT staff to take necessary action and stay ahead of issues.

PATIENT & STAFF EXPERIENCE

The age-old expression, "what have you done for me lately" applies in healthcare, and a user's experience of the network is only as good as the last time they used it. In order to get the full value of a high-performing network, new tools must be deployed to ensure that it is living up to modern-day expectations. Additionally, patients and guests expect a level of personalization that is often lacking in their experiences with a healthcare system. It is time to renew the focus on how patients, providers, and IT experience the network.

Improve patient and guest experiences with location services

Using the power of location, Aruba can improve the patient experience and help raise engagement scores. Aruba APs are location ready and, when supplemented with Aruba Beacons, can make an entire healthcare organization location smart. Aruba Meridian is an integral part of a holistic app strategy by using location services to enable blue-dot wayfinding, push notifications, and implement specific campaigns. Utilizing analytics from the network, facilities can ensure patients are helped the moment they enter a facility with automated check-in or enable them to use their smartphone to find a department (radiology, billing, or lab work) without frustration or lost time.

IT Operator Experiences Matter: Often forgotten is the way that IT experiences the network, in light of the constant demands for performance and pressure to deliver. Aruba provides solutions that unify wired, wireless, and WAN operations so that operators can simplify their day-to-day operations and feel confident that they can deliver an always-on and secure network for their healthcare organization.

Find and track expensive assets

Aruba's asset tracking solution helps healthcare facilities track assets by leveraging the value of their location-ready Aruba WLAN infrastructure and Bluetooth-based Aruba Tags. Wheelchairs, infusion pumps, and other expensive mobile assets can be cost-effectively monitored and found when needed, freeing up caregiver time to focus on a patient and not on finding a high-value item, which will increase staff efficiency, reduce equipment costs, and improve caregiver satisfaction.

Rapid response in critical situations

Healthcare facilities have usually been expanded through addition and have millions of square feet. In a critical code, getting the resuscitation team to the patient's bedside quickly is a matter of life or death, but many times they will not know how to get there. Aruba Meridian Location Services will help resolve this by routing the team properly the first time.

A PARTNER YOU CAN TRUST AS YOU DELIVER CARE

Aruba was founded in the mobile, cloud, and IoT era and has been working with leading healthcare agencies from the start to tackle major technology problems within healthcare. With the Aruba Edge Services Platform, network management is automated, IoT is profiled and secure, patients find their way, and IT can perform routine patching without user traffic interruption. From our leadership and throughout our organization, you will have our commitment to work alongside of you. Along with the Aruba "Customer First; Customer Last" mentality, the Aruba Edge Services Platform is enabling new breakthroughs in Healthcare IT service delivery.

ACHIEVING THE "TRIPLE AIM" OF HEALTHCARE

As Healthcare systems continuously work to better achieve the Triple Aim of Healthcare, Aruba is a partner that has been obsessively focused on delivering outcomes since our founding. There is a high level of trust that communities place in their health systems, as they rely on them to provide needed services, many times at a critically important points in the life of a family as the health system cares for them.

Care Provider Experiences Matter:

Improving the Experience of Care

Caring for the Health of the Population

Reducing the per capita cost of Healthcare
- Source Institute for Healthcare Improvement (IHI)

In order to improve the experience of care, all the little things should work seamlessly, from the patient device connecting, to the advanced security needed to separate network functions, each part needs to perform flawlessly. The focus must return to the patient and their outcome, instead of convenience for the health system. Additionally, leveraging the power of real-time data to improve care delivery is a critical value to Healthcare. In order to collect the data at the edge, in a patient's room, a strong network must deliver at all times and provide ready access to this data. It will be the unlocking of personalized insights for a patient and the treatment of their complaint that will enable the experience of care to improve across a health system.

Because the many social determinants of health are highly varied, each community will require a different emphasis, but some commonality will remain. In order to care for the health of a population, a health system needs to engage in robust outreach and improved access to care must be developed. Using telemedicine to improve access to care and enabling pop-up clinics in needed areas are simple ways that technology can impact the way a health system will care for the health of the population they serve.

For years, Healthcare IT has been seen as an expensive cost center within the budget of the Health system. While the cost of care is not dependent on the cost of IT, the ability to deliver incredible technology in a better financial model will help alleviate the burden of costly healthcare delivery for the system. For many years, the budget of Healthcare IT has been focused on keeping the existing complicated systems operational and little has been invested in improving delivery. In order to reduce the per capita cost of Healthcare, the IT budget has to be examined to ensure alignment with the organizations mission and to determine the advanced outcomes that the system requires from their Healthcare network.

A final viewpoint, though not included in the Triple Aim framework, is the role of Provider Satisfaction. With the rate of burnout being so high among those who provide expert care in our health systems, many blame the technology they use for impeding their engagement with the patient. While the number of systems used to deliver care can be streamlined, they must be delivered in a reliable and consistent manner to speed the providers access to relevant information and limit their frustrations from non-performing technology. Their experience of technology is very important for Healthcare IT to consider as a core measurable.

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