Enabling Mobility in Medicine via an Application-Aware Wireless LAN

Anywhere, anytime wireless network access to health records, for voice communications and for medical devices has proven to improve quality of care and reduce costs. The mission-critical and sometimes life-critical nature of medical processes requires the enabling wireless network to be designed with the highest levels of reliability and security. Thus far, meeting such stringent requirements have dictated the need for a dedicated “application-specific” wireless network infrastructure for each service, raising both the total installation expense and the ongoing operating expense burden. Aruba Networks drastically reduces network complexities and costs with its “application-aware” wireless LAN that reliably delivers data, voice and medical device traffic over one common network.

Only Aruba offers a high-speed 802.11n wireless LAN for hospital-wide mobility with:

- Adaptive Radio Management (ARM) to ensure consistent application performance using unique over-the-air Quality of Service (QoS) and interference mitigation algorithms
- Role-based security to protect users, devices and health records in an environment with a diverse community of network users and a wide-array of network traffic type.
- Centralized management console to handle multiple vendors and generations of wireless LANs.

Aruba’s application-aware wireless LAN has been used by thousands of hospitals and clinics to enable:

**Voice over Wireless LAN (VoWLAN)**

Vocera, Ascom, Polycom and Cisco make specialized VoWLAN devices that streamline communications to improve workflow, shorten response times and increase patient flow.

- Nursing: Patient alerts from nurse call systems can be directed to a nurse’s VoWLAN device and enable 1-touch callback to the patient’s room. This reduces overhead pages to provide a more tranquil environment, reduces the number of footsteps per nurse, and provides a better patient experience.
- Porters: Improves productivity, workflow, and patient throughput by being able to quickly reach an available porter.
- Care Team Communications: Quickly connect a crisis team with push-to-talk applications supported by VoWLAN devices. Some devices even include a dedicated application button for push-to-talk.
- Physicians: Dual-mode devices keep physicians connected by extending the hospitals communications services to physicians while they are connected to the hospital WLAN.

**Real-Time Location Services and Condition Monitoring**:

The Wireless LAN can be used to provide location, status and condition information of hospitals assets, patients, and staff to improve asset utilization and reduce asset loss.
• Clinicians / Staff: Quickly locate needed resources, resulting in shorter wait times, improved asset utilization, and asset loss reduction. It also prevent 'hoarding' of assets.

• Bio-Med / Clinical Engineering: Easily locate, perform preventative maintenance, and get valuable assets back into circulation quickly. This helps achieve compliance requirements and improves asset utilization, which often leads to fewer assets being purchased or leased.

• Condition Monitoring: Specialty Wi-Fi tags can detect temperatures and humidity levels of hospital refrigerators, freezers and operating rooms to ensure safe temperature ranges of valuable hospital assets.

• Workflow: Leading hospitals are using location tags to improve patient flow and clinical productivity. Some hospitals have even use location services to track staff and patient traffic patterns to identify more efficient hospital designs.

• Safety: Hospital staff can be alerted when a patient, wearing a location tag, wanders outside of a specified zone or enters a restricted area. Staff members using location badges can also set off an alarm that includes their location in the event of an emergency.

Wireless Medical Devices

• Patient monitors, spot check monitors, smart IV pumps, glucometers and other medical devices from leading vendors, including Philips, Draeger, Hospira, and Baxter are converging on the WLAN. 802.11n networks provide increased bandwidth and reduce data loss relative to other telemetry systems.

Electronic Medication Administration/Barcode Medication Administration

• Point of care process utilizing barcode technologies and WLANs to automate the process of medication administration. This data can then added to the patient's electronic medical record.

Workstation on Wheels

• Integrated support for Unified Communications (voice, video and data) enables remote consultations at the patient bedside, video interpreter services and clinical access to EMR/Clinical Information Systems.

Wireless Patient Bedside Terminals

• Patient bedside terminals now operate over 802.11n to deliver IPTV, web access, video and voice communications, access to educational and to multimedia educations and informational services, meal ordering, and patient surveys. Clinicians can also use these terminals for EMR/Clinical Information System access.

Converged Mobile Devices

• Increased mobile computing power, larger and higher resolution screens, and a development community resulted in the explosion of mobile healthcare applications. For the iPhone alone, there are over 1,500 applications for healthcare professionals today and applications for the iPad following suit. Physician adoption of smartphones is forecasted to reach 81% by 2012 and will continue to power the development of new healthcare applications.

Building Automation and Surveillance

• Wireless building automation solutions provides a hospital a cost-effective and flexible means of monitoring and managing HVAC, lighting, fire alarm, and security systems.

• Video Surveillance systems are converging on the WLAN to reduce installation costs, enable more effective storage solutions provide improved staff, and patient security.

The Aruba Solution:

Aruba's application-aware 802.11n wireless LANs are designed to provide reliable, hospital-wide wireless access to a wide variety of users (including clinicians, administrators, patients, and visitors) and applications (including clinical information, voice communications, and connectivity for portable medical devices)
The architectural scheme of the Aruba solution typically includes centrally-managed 802.11a/b/g/n Access Points (APs), Multi-Service Mobility Controllers and a centralized management console. APs provide secure wireless connectivity to client devices and tunnel all wireless LAN traffic over a GRE or IPsec tunnel to one or more mobility controllers located in the distribution or core of the network.

Typically one or more master Multi-Service Mobility Controllers are installed in the data center, and are used as the central configuration and management point for all Aruba wireless LAN and remote access points. Large sites typically use a master controller, which can support up to 500 remote controllers and can back-up a controller in a remote location in the event of an outage. Multiple master controllers can share the load of managing local controllers and remote sites, providing an elegant and cost effective system for supporting a healthcare enterprise’s business continuity and disaster recovery needs. The AirWave platform is a single management console for installations with multiple master controllers as well as for legacy non-Aruba wireless LANs.

For ambulatory facilities, physicians’ offices, and large clinics that are geographically separated from the main healthcare facility, a local mobility controller is required for application-continuity and security policies. The local controller automatically obtains its configuration from a master controller. User roles are applied based on group policies that are defined in the authentication infrastructure, and guests can be tunneled outside of the network to terminate in the DMZ. Each local controller automatically calibrates RF coverage to optimize application performance and fill any coverage holes. To extend wireless coverage into areas that are too costly to wire, Aruba APs can backhaul over Wi-Fi using a wireless mesh.

For physician-offices, patient homes, and satellite clinics, Aruba’s Remote Access Points (RAPs) cost-effectively and securely extend hospital-like connectivity. RAPs connect to the data center through any Internet connection using either a local ISP or a 3G wireless modem, and then are automatically discovered and brought on-line without any user intervention.

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**INDUSTRY BRIEF**

**Healthcare Solution**