



Introduction

Delivering the right wireless prescription for the healthcare industry is one of the main doses to a successful healthcare facility due to the dependence of connected devices and real-time on-demand information required by healthcare staffs. With the proper Wi-Fi solution, healthcare staff and organizations will experience improve communication between staff, have faster access to high-resolution video, and speed up delivery of medical images. In addition, Wi-Fi access availability in the lobbies and waiting room increases overall customer experience during trying times.

Behind the clean, tidy, and white curtains of the healthcare facility lie the dangers of radio frequency (RF) interference and the need to secure patient records. For these reasons, many healthcare organizations everywhere turn to Inscape Data Corporation to provide the critical wireless LAN (WLAN) connectivity the healthcare organization requires. With dynamic frequency selection, high RF isolation, lower access point per unit area, and highest AES encryption available, Inscape Data Corporation's SB3000 access points deliver the wireless connectivity solution the healthcare industry need the most.

WLAN fundamentals in healthcare

Due to life critical functionality requirements in the healthcare environment, application performance has become an absolute must. A dropped call during a code-blue response or an alert/alarm not being received by a caregiver can impede workflow and result in negative outcomes or sentinel events. WLAN deployments in hospitals are not just confined to one department or several departments. They are becoming ubiquitous within the hospital. These application requirements have evolved beyond laptops on carts for the electronic medical record to voice over IP communication and other priority medical applications. These Lowering infrastructure costs while improving performance and reliability.

Unique medical applications include the deployment of hundreds of wireless infusion pumps and wireless patient monitors that traverse not just the step down unit, or single department, but provide wireless transport patient monitoring anywhere in the hospital. In addition, as standards and technologies evolve to enable the required quality of service, there is a rapid evolution that is occurring as many vendors are now offering patient worn telecom badges and telemetry devices. High reliability and life critical application that transmit patient data like vitals and waveforms need to be accessed on the fly, require the demand most consumer and lower end wireless equipment cannot provide. In a nut-shell, today's wireless LAN access points cannot meet the stringent requirements of the healthcare environment – secure, reliable, and performance.

RF Challenges in the healthcare

One can not argue hospitals have one of the most challenging RF environments to work with. There are vast number of medical equipment and devices already using the ISM (Industrial, Scientific, and Medical) band. This is just the core. To name few other RF usages in the hospital place are patient logistics, inventory logistics, meal planning, device tracking, patient tracking and much more.



If one would consider interfering equipment to be the only source of interference, consider again. The hospital building itself causes interference due to wide range of construction attributes from the very old to new renovations and buildings. Whatever the case, the propagation and penetration of RF signals are challenged by solid concrete, tile over chicken wire in concrete, lead-lined walls in radiology, vast cable trays of wire in the ceiling, isolation rooms, and newer construction methods such as poured concrete in metal pan construction from floor to floor. This newer type of construction often traps RF signals from propagating anywhere and can limit penetration of consistent and reliable RF coverage from floor to floor.

Unlike traditional enterprise environment where the business model is less dependent on mobility, healthcare workers and patients are frequently moving about. Always on and always reliable wireless network connectivity is crucial for the success of the healthcare business.

Making RF reliable for the healthcare industry

The 21st century of wireless technology helps break barriers in speed and reliability of a wireless network. Technology such as interference mitigation and dual polarization antenna offers vast improvement of wireless reliability compared to wireless LAN technology of the past.

Reliable and dependable wireless technology provides stability and predictable performance parameters that is more manageable for the healthcare IT staff. Parameters like throughput, coverage, and capacity can be used more concrete in the design phase of the wireless network to anticipate the performance criteria and expectations.

Older and more current wireless technology utilizes dumb omni-directional antennas that are polarized only in one plane. With the newest wireless access points, multi-polarization and signal forming technology enhances wireless signal to noise ratio which results in higher throughput and lower latency. Antennas on a multi-radio device no longer function just as a radiation source but work together with other radios as a collective to form a coherent cloud of signals that delivers the data reliably to the wireless clients.

To further increase reliability, the Inscape Data's LinkPower™ series of ruggedized switches offers increased reliability of the access points by providing reliable power through its PoE interface. The remote manageable switch is the industry's first environmental proof five-port Ethernet Switch with an adjustable voltage feature. Based on Inscape Data's patent-protected technology, the Linkpower switch powers a wide range of healthcare infrastructure wireless network and security applications and significantly reduces the complexity of healthcare wireless network installation, integration and ongoing network maintenance. The adjustable voltage and other dynamic features, including remote web browser PoE, remote device power cycle, heartbeat monitor and individual port troubleshooting capabilities, make the LinkPower LPS1000 the industry's most effective and robust outdoor PoE Switch to power healthcare wireless access points and IP video security cameras.



Security Measures

Keeping wireless LAN secure in the healthcare facility is just as crucial as keeping enterprise environments secure. With the aid of the latest wireless encryption algorithms available, advance encryption system (AES) offers secure wireless environment for the healthcare industry. AES is an approved security algorithm by the government to transport top level information securely. Utilizing wireless LAN encryption WPA2-Psk enables AES encryption. The use of WPA2-Radius provides an even higher security implementation but requires higher level of maintenance and backend support.

In addition to standard IT security measures for local area network, rogue AP detection and the use of VLAN to differentiate public and secured networks is a must. Providing a secure wireless network the hospital staff can utilize and high performance unsecure network the public can access will offer a level of service and customer satisfaction from frustration levels already inherent in the healthcare environment.

Reducing Capital Expenditure

Less means more when it comes to wireless LAN in the healthcare industry. By using enhanced access points designed for the healthcare industry, less access points are needed to provide the same coverage compared to traditional access points. Less access points means less RF. Less RF means increased quality of service of the connected wireless clients.

Here are some of the benefits of using access points designed for the healthcare industry

- Decreased need for RF site surveys.
- Decreased requirements for sophisticated and/or specialized integrators.
- Decreased complexity of setting up security policies and procedures that decreases risk to the healthcare enterprise.
- Greatly reduce the capital and operational costs by deploying fewer access points that yield a two to four fold improvement in range and capacity
- Direct support for latency-sensitive applications such as IP video and voice over IP applications
- Increased client connectivity through the use of MIMO radios which take advantage of multi-path spatial multiplexing.
- Reducing port counts on the network.
- Reduction of warranty costs on access points, controllers and switching equipment.

Conclusion

Delivering the right wireless prescription for the healthcare industry is not easy, but with the right wireless equipment and technology one can greatly reduce long term maintenance cost with great confidence in high reliability wireless network to meet the demands of the healthcare industry.