

Not-for-Profit Hospital Delivers Better Patient Care with Mobility

Southeast Alabama Medical Center improves clinical workflow efficiency with Cisco Mobility solutions and Intel® Centrino® processor technology.

EXECUTIVE SUMMARY

SOUTHEAST ALABAMA MEDICAL CENTER

- **Industry:** Healthcare
- **Location:** Dothan, Alabama
- **Number of Employees:** 2400+ (370 Beds)

BUSINESS CHALLENGE

- Enhance caregivers productivity and collaboration by accessing Unified Communications and EMR and other medical applications in real-time throughout the facility
- Manage and provision multiple mobile services cost effectively and efficiently
- Extend clinical applications and information to mobile clinicians at same performance levels as on the wired network

SOLUTION

- Pervasive Voice-ready Cisco Unified Wireless Network for mobile collaboration on the move, anywhere in the facility
- Wireless control system for integrated security, centralized network management, and location of rogue devices
- Wireless infrastructure to support electronic medical records and unified communication at patient bedside
- Next generation 802.11n wireless to deliver predictable, high-speed access for high-bandwidth applications like medical Picture Archiving and Communication Systems (PACS)

RESULTS

- Patient information at the point of care improves overall quality of care
- Unified Wireless Network provides a platform and technology foundation to support vital applications for bedside patient care
- IT Team can manage the entire hospital network centrally and efficiently
- Increased productivity of administrative staff resulted in higher patient satisfaction

Business Challenge

Southeast Alabama Medical Center (SAMC), a longtime forward-thinking pioneer for healthcare in the region, is a not-for-profit community health system dedicated to improving the health and quality of life to the residents of southeast Alabama, southwest Georgia and the Florida Panhandle. It operates a multi-floor facility with a 370-bed regional referral center, serving approximately 600,000 people throughout its neighboring communities and counties.

SAMC's previous wireless networks had been designed to support a small set of clinical applications, and as the health system's needs evolved, the network could not provide the coverage and reliability that clinicians required for VoIP throughout the facility. In the hospital's highly mobile and collaborative environment, nurses and medical staff do extensive work while in motion throughout the facility. The campus had been created over the years by joining multiple buildings, of varying floor levels and many concrete walls still intact throughout, into one large facility. This made a challenging RF environment for voice communications which often resulted in dropped calls while roaming throughout the facility, poor voice quality and the inability to be reached, because of limited coverage. As a result SAMC was limited in their ability to deploy enhanced Mobile Collaborative Care applications (e.g. Unified

Communications'—single number reach, presence, etc.) as well as Secure Wireless applications (e.g. Bedside Charting and EMR) which were critical for their growth and improved patient satisfaction.

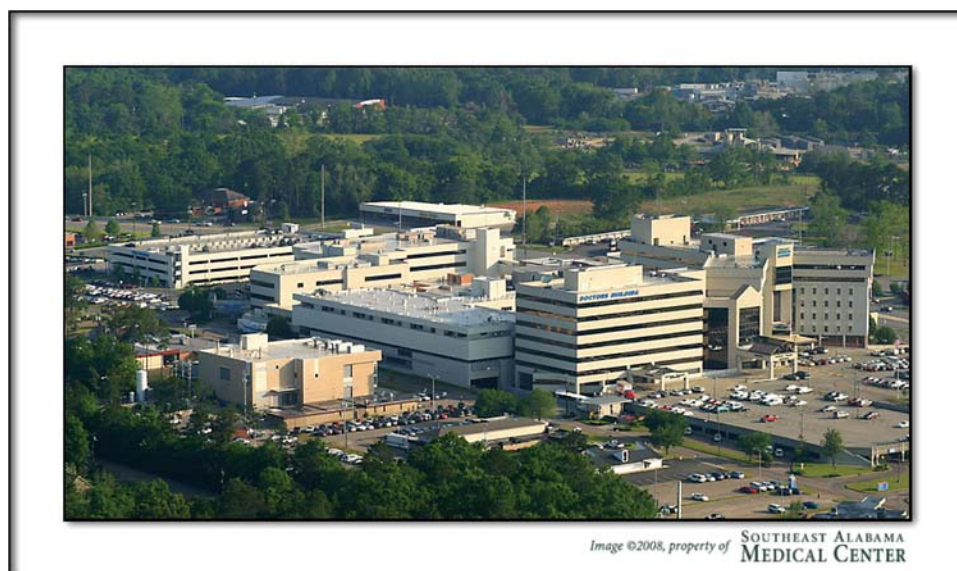
"Wireless infrastructure was going to play a crucial role in providing true mobility throughout the facility for our clinicians so we needed an infrastructure that was highly reliable, easy to manage, and resilient for voice and other patient care applications," says Scott Lapham, network engineer at SAMC. The existing wireless infrastructure consisted of standalone access points across some

parts of the 900,000-square-foot facility, supporting a combination of ASCOM® i75 phones and Cisco® 7920 Wi-Fi Phones. The legacy deployment did not support inter-subnet roaming and real-time radio frequency (RF) control of the access point for deployment and management of advanced mobility services such as voice. Each access point in legacy deployment had to be configured and managed independently. While this architecture was adequate for providing WLAN connection in limited areas for SAMC initially the deployment could not scale to support the entire facility and the business imperatives they needed in the future in an efficient and cost effective manner.

In addition to the needs of providing ubiquitous mobile IP voice throughout the facility, SAMC needed to provide its clinicians with bedside charting, order entry and drug administration applications. For the plant services and purchasing departments they needed the ability to have access to inventory management applications. Although the planned deployment held the potential to empower caregivers in many new ways, the clinical tools would also place greater demands than ever before on hospital information systems. In particular, clinicians would need unprecedented mobility to be able to access patient records and clinical applications from anywhere in the center, including at the bedside. That capability would require an extremely robust, highly secure, and pervasive wireless network and one that is easy to manage while maintaining lower total cost of ownership.

Solution

The SAMC decided to migrate its existing wireless network to a Cisco Unified Wireless Network, a centrally managed controller based architecture for simplified management and enhanced security and to support fast secure roaming and the latest voice features such as 802.11e (quality of service [QoS] standard for multi-media traffic). The SAMC team embarked on the project by conducting a thorough site survey using Airmagnet and Cisco Spectrum Analysis tools to identify potential interference problems and optimize the network infrastructure to support delay sensitive applications such as Voice. Cisco Spectrum Analyzer supports real-time spectrum intelligence to detect, classify, and locate non Wi-Fi sources of RF interference in the unlicensed 2.4-GHz and 5-GHz bands. Quickly detecting and mitigating RF interference improves coverage, capacity, quality of service, and security of the wireless network.



Cisco was already the trusted provider of the company's Ethernet switches and routers for the wired network which provided industry-leading reliability and connectivity to the desktop, as well as integration of security, management, and wireless modules. The features of the Cisco Unified Wireless Network met the company's security needs while offering ease of management. The centrally managed architecture has a lot of benefits, and there is less administration required than under older wireless LAN deployment, because the configuration is all central and automated.

The new wireless network consists of eight Cisco 4400 Series Wireless Controllers along with over 450 Cisco Aironet 1130AG Series Access Points installed throughout the facility. The Cisco Unified Wireless Network Architecture offers redundancy at several levels, at the RF level, the system "self-heals" when one or more APs become inactive. The architecture also supports port redundancy per controller and controller device redundancy. SAMC designed a wireless network deployment that would support both wireless voice and data access anywhere in the facility. The IEEE 802.11a,b,g Cisco Aironet 1130AG Series Access Points can be centrally managed with Cisco 4400 Series Wireless LAN Controllers in high availability architecture along with the Cisco Wireless Control System (WCS) management software. The Cisco WCS provides centralized network management, security monitoring, and localization of rogue devices and automatically associates each new access point with the controller, eliminating manual configuration and saving many hours in maintenance time.

In addition to centralized management and rapid deployment of all of the access points, the Cisco Unified Wireless Network offers segmentation of user groups. This feature enables SAMC IT staff to configure separate virtual LANs for voice and data, helping to ensure both data security and quality of service for voice traffic. Voice receives top priority to support the ability to roam seamlessly from access point to access point without dropping a call. QoS and the reliability of the network are further enhanced through support for Wi-Fi Multi Media (WMM), which prioritizes delay sensitive traffic to provide uninterrupted service, and voice optimization.

As part of its continued drive to incorporate leading technology, SAMC also deployed next generation 802.11n draft 2.0 wireless with Cisco Aironet 1250s combined with Intel® Centrino® processor technology with Intel® Next-Gen Wireless-N clients for performance testing. The pilot was set up to see if users could expect the same application performance on wireless as they enjoy on the wired network. When the performance results were compared with 802.11a and 802.11n, the 802.11n client performed seven times faster than the 802.11a client. The 802.11n client achieved speeds of up to 165Mbps/sec and was able to download 2 simultaneous files, each 500 MB, in just about 2 minutes—65 percent faster than the 802.11a client. These phenomenal performance results along with the enhanced reliability that SAMC was able to achieve with the joint Cisco and Intel 802.11n solution will be leveraged throughout the facility in the future for deploying bandwidth-intensive applications. "The Intel® Centrino® processor technology with Intel® Next-Gen Wireless-N notebooks communicating to the Cisco Aironet 1250 Series access points exceeds our existing desktop performance," says Lapham, "we were able to download images on a wireless laptop on the 802.11n network just as fast as on wired desktops."

Results

"Today, the Cisco Unified Wireless Network Solution is transforming the way our staff works at SAMC. They can collaborate and communicate more efficiently, and even patients and visitors are benefiting from secure, ubiquitous network connectivity using the Cisco guest access capability. More importantly, clinicians at SAMC are already demonstrating the ability to use the ASCOM and Cisco Wi-Fi phones over Cisco Unified Wireless Network anywhere in the facility, at the point of

patient interaction, is directly improving the quality of patient care that we can offer which in turn leads to overall enhanced patient satisfaction”, says Eric Daffron, division director- Information Systems at SAMC.

Figure 1. Women's Imaging Check-in Area



At SAMC, physicians and nurses use Wi-Fi devices (Fujitsu tablets, IBM and Dell laptops) that allow them secure access to clinical information at patient bedside, in operating rooms and in ancillary areas. With the Cisco secure wireless solution, clinicians benefit from WLAN technologies to increase their productivity while keeping patient data private and secure, helping SAMC meet the rigorous regulatory compliance demands.

“Our physicians and nurses are already demonstrating that the Cisco secure wireless network provides them secure access to patient information (e.g. EMR and bedside charting applications), and improves their interaction (via VoIP and mobile collaborative care applications) at the point of patient care anywhere in the facility while maximizing their work efficiency” says Lapham.

The wireless network at SAMC extends beyond clinical areas, throughout business and administration offices bringing the benefits of mobility even to non-clinical employees.

SAMC is also taking advantage of the guest access capabilities of the Cisco Unified Wireless Network to provide internet connectivity to patients, visitors, visiting doctors, partners and vendors- without compromising the security or performance of clinical applications. With guest access capability, SAMC is able to offer their patients the capability to research and find medical information on the web or to interact and keep in touch with their families. This provides a great convenience for patients and the patients' visitors. For visiting doctors, partners and vendors access to network via guest access gives them the ability to be responsive and effective for their own job functions.

Unlike past wireless implementations, this secure wireless deployment provides the pervasive, nonstop connectivity, simple management, performance that parallels the existing wired network

and excellent quality of service required in a healthcare environment. “Underneath everything that we do today is a solid, highly reliable and always available infrastructure thanks to the Cisco Unified Wireless Network” says Lapham.

Cisco centralized management has proven invaluable for deploying access points easily and rapidly and for enhancing SAMC’s network security by quickly detecting rogue devices and wireless intrusions. The secure nature of the network allowed IT staff to keep the guest network separate from the corporate network, maintaining the security of the hospital network.

With a controller based architecture and dynamic RF capabilities managing wireless connectivity, call capacity and network security is far easier and more cost effective as well. In the event that an access point fails, fault management features quickly identify it so that it can be replaced, thereby maximizing wireless availability throughout the facility. Reporting features provide summarized views of wireless network usage, which is very useful for capacity planning.

Currently SAMC has deployed 462 802.11 a/b/g and 802.11n Cisco Access Points, 240 notebook (Fujitsu, IBM and Dell) clients, including Intel® Centrino® processor technology with Intel Next-Gen Wireless-N, and 200 VoIP (Ascom i75 and Cisco 7920) phones. The tablets in the Pain Management Center have enabled clinicians to make better decisions and place rapid orders while working in the fast-paced environment. Communication between the surgical and transport staff has improved through the use of wireless phones for text messaging and voice calls, resulting in a faster turnaround of operating rooms.

Next Steps

SAMC plans to continue building on the secure wireless infrastructure to provide new mobility services. The center has already taken advantage of the voice-over-WLAN capabilities of the Cisco network. They are also planning on expanding the wireless nurse call system with the Wi-Fi phones. SAMC plans to expand the Mobile Care solution by integrating clinical information, where status alerts can be sent to a fellow clinician’s mobile device faster, allowing them to receive data anywhere with wireless coverage in a hospital facility, and improving access to information and response times. The solution allows for instant two-way communication among nurses and physicians, and allows patients to immediately connect with their attending nurse. SAMC is also planning to deploy context aware mobility solutions that help track medical equipment throughout the center, allowing staff to immediately locate assets (e.g. tablets, laptops, Wi-Fi phones) with the Cisco Location Appliance. The solution allows for dynamically capturing contextual information (in this case location information) about the Wi-Fi clients such as the tablets and laptops being used and can easily be expanded to medical devices with RFID tags.

SAMC plans to roll out more of the 802.11n access points as needed especially in the areas where there is a dense deployment of devices with need for high bandwidth applications such as with radiology and surgery.

“We are just getting started with all the possibilities” says Lapham. “As we begin to extend the network to new clinical applications, and devices, our Cisco Unified Wireless infrastructure is going to become even more essential to supporting the continuum of care. There are lots of exciting possibilities, and we are confident that with Cisco behind us, our secure wireless network will accommodate whatever we need and want to do.”

PRODUCT LIST

Wireless

- Cisco 4400 Series Wireless LAN Controllers (6x4404 and 2x4402)
- Cisco Location Appliance
- Cisco Spectrum Expert
- Cisco Aironet 1130 AG Series Access Points (457x1131's)
- Cisco Aironet 1250 Series Access Points (5x1252's)
- Cisco Wireless Control System Software
- Intel® Centrino® processor technology with Intel® Wireless WiFi Link 4965AGN

Routing and Switching

- Cisco Catalyst 6500 Series Switches (3 w/ Sup 720s)
- Cisco Catalyst 3750 Series Switches (90)
- Cisco 7206 Series Router

For More Information

To find out more about the Cisco Unified Wireless Network Solution, visit

<http://www.cisco.com/go/wireless>.

To find out more about the Cisco Next Generation Wireless solution, visit

<http://www.cisco.com/go/nextgen-wireless>.

To find out more about the Cisco Healthcare Solution, visit <http://www.cisco.com/go/healthcare>.

To find out more about Southeast Alabama Medical Center, visit <http://www.samc.org/>.

To find out more about the Cisco and Intel alliance, visit <http://www.cisointelalliance.com>.

To find out more about Intel® Centrino® processor technology with Intel Next-Gen Wireless-N, visit <http://www.intel.com/go/wifi>.



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