



University of Miami Medical Center Takes Patient Care to the Next Level with the Meru WLAN System

As the only academic medical center in South Florida, the Miller School of Medicine at the University of Miami serves more than five million people, and it has earned international acclaim for research, clinical care, and biomedical innovations. The UM Miller School of Medicine has 770 faculty physicians and a total of 6,000 employees. In addition to the 76-acre complex of the University of Miami/Jackson Memorial Medical Center in Miami, the school operates clinical facilities at the Miami Veterans Administration Medical Center, five primary care centers throughout Miami-Dade County, and a half-dozen area hospitals and clinics in cities like West Palm Beach, Naples, and Deerfield Beach.

Challenge

Provide high-performance mobility services to its clinical, research and educational staff, medical students, and visitors of University of Miami Medical Center and its network of clinical facilities throughout South Florida

Solution

- Meru's Virtual Cell Technology eliminates handoff delays and creates seamless access
- Over-the-air Quality of Service (QoS) for both downstream and upstream traffic ensures high quality voice and data service to all Wi-Fi clients on the same infrastructure
- Meru's WLAN System coordinates all traffic on the network and eliminates co-channel interference by placing all APs on a single channel

Benefits

- Supplement existing APs with the Meru WLAN System while preserving existing investments in other products such as its outdoor WLAN product
- Easily scale the network to meet the dynamic requirements of the medical center by automatically optimizing coverage and compensating for shifting user density and application loads
- Derive significant ROI by eliminating costs associated with site surveys or RF planning and by leveraging a single infrastructure to deliver voice and data applications

A Pervasive Wireless Vision

As IT Director for a major academic medical center serving millions of people in hospitals, clinics, research institutes, and teaching facilities throughout south Florida, Chris Bogue has a vision: to enable appropriate access to any network or information resource for anyone, anywhere, at any time. To execute his ambitious plan, Chris has become one of the medical IT community's leading proponents of wireless technology, and he has been among the first IT executives in North America to address the challenges of truly pervasive wireless access that supports a full range of applications across a large and geographically-dispersed facility. Today, Meru Networks is helping him realize his vision.

With millions of square feet of classroom, hospital, clinic, laboratory, and administrative space to cover, it was clear to Bogue from the beginning that wireless LAN technology would be the only feasible approach. While his vision of pervasive connectivity includes general wireless access to e-mail and Internet, it is primarily driven by the convergence of biomedical technology and IT technology in applications like wireless patient charting systems, EKG machines that travel with patients, beds that monitor patient vital statistics and relay them to nurse stations, and wireless video transmissions that educate patients about their health issues. "As the lines between biomedical and IT disciplines begin to blur," observes Bogue, "a lot of biomedical devices will eventually connect to wireless infrastructures in hospitals. We want to make UM School of Medicine one of the leading organizations for leveraging wireless technology in healthcare."

Bogue's team began executing on his vision in 2002, when they deployed wireless access points for student use in the cellular biology classrooms and in hospital operating rooms at the university's Bascom Palmer Eye Institute to support mobile clinical information systems.

Since then, Bogue's team has continued to expand wireless coverage and applications with a series of initiatives, including:

- Deployment of mobile wireless carts in other hospital areas to support registration, medical records access, patient scheduling, and clinical information applications
- Additional classroom coverage throughout the medical school
- IP voice communication badges that link staff and physicians between clinics in Naples, West Palm Beach, Deerfield Beach, and the main campus via a secure private WAN to enable immediate communications and eliminate long distance telephone charges
- A facilities work order management system that allows employees to use wireless barcode readers to look up preventive maintenance schedules or maintenance histories or to order parts for heating, cooling, and other systems.
- A "Community Cloud" providing 1.5 square miles of outdoor wireless coverage for Jackson Memorial Hospital, the University of Miami Hospital Clinics, Cedars Medical Center, and the other facilities in Miami

Challenges

With the expansion of its wireless LAN deployment, the IT team began to encounter the usual issues with rogue access points set up by students or others who wanted to jump on the wireless bandwagon more quickly than specified in the IT department's rollout plans. But a far more difficult problem was the need for rapid scalability as on-going renovations frequently resulted in denser networking environments.

"This is a pretty large organization, and there are a lot of departmental moves and changes from one facility to the next," says Bogue. "The issue was constant shifts in density requirements. For example, you might

University of Miami Medical Center Takes Patient Care to the Next Level with the Meru WLAN System

www.merunetworks.com

blow out a couple of walls and build a classroom in what was an office space, so all of a sudden you needed to support 50 or 60 concurrent wireless connections when before you might have had one or two. We were continually having to re-configure access points (e.g., AP placement, signal strength, channel selection) to compensate for user density and we had to deal with co-channel interference whenever we added more APs."

A related issue surfaced when the IT staff deployed indoor access points adjacent to the Community Cloud's outdoor coverage area. With the outdoor WLAN equipment running on 802.11b channel 11, it was necessary to provision the indoor APs on the two unused 802.11b channels. Doing so, however, created a catch-22 situation because it is impossible to simultaneously minimize interference and provide 100% coverage with only two alternating channels. Moreover, juggling access points on alternating channels for more than a million square feet of space would require the team to invest significant time and capital in RF planning and site surveys.



Meru is the Cure to the School's Wireless Ailments

When he read Meru's claims that the company's Wireless LAN System could eliminate site surveys, channel interference, and user density issues, Bogue moved immediately to trial the system in the school's 70,000-square foot Professional Arts Center (PAC). After adding the Meru Wireless LAN Controller to its secure data center, the IT team studied the PAC building's floor plan to gauge how much area they could cover with each access point, and then ran Ethernet cabling and hooked up the APs. Since Meru's Air Traffic Control technology supports all APs on a single channel, automatically optimizes coverage among APs in a given area, and dynamically balances user loads among nearby APs, there was no need to plan alternating channels or to manually adjust power levels to compensate for varying user densities in different areas.

During the trial, the Miller school held large conferences in the facility and provided reliable, high-performance Internet and e-mail access to attendees and presenters.

Next, the IT team tried Meru's system in the indoor area adjacent to the outdoor Community Cloud, and likewise

found that the ability to operate all of Meru's APs on one channel eliminated the need to alternate channels, thereby delivering the flexibility to provide full indoor coverage without interfering with the outdoor WLAN system. Meru's infrastructure-based control features, which coordinate coverage across all APs, enabled Bogue's team to easily integrate the new WLAN gear while preserving existing investments in other products. With the outdoor system running on channel 11 and nearby legacy APs running on channel 1, Bogue's team simply configured the Meru APs to operate exclusively on channel 6.

After several weeks of trials without a hitch, Bogue was convinced that he had found the right infrastructure for his campus-wide deployment plans. "Once we had the cabling infrastructure in place for the access points in each facility, we could just look at a floor plan to install the APs. We didn't have to pay experts to do RF planning or site surveys," said Bogue. In addition to eliminating the cost of site surveys or RF planning, Bogue anticipates considerable savings by converging all voice, data, and video services on a single WLAN infrastructure, rather than having to deploy several different types of WLANs for different applications.

Making the Wireless in Healthcare Vision a Reality

Now, in one of the most extensive wireless LAN deployments in North America, the UM School of Medicine is deploying the Meru system throughout its hospitals, clinics, educational facilities, and offices. The entire Meru network will operate on one channel, and will deliver converged voice, data, and even video services with automatic coverage optimization and load balancing to compensate for shifting user density and application loads.

Phase I of the rollout, due to be completed in March 2005, will cover most of the University of Miami/Jackson Memorial Medical Center along with the Bascom/Palmer Eye Institute, facilities in West Palm Beach, Naples, and Deerfield Beach, and several other clinics, all tied together via private wireless bridges.

Over the next few years, the pervasive WLAN infrastructure will enable voice, database access, patient information data collection, e-mail, Internet access, streaming video, facilities maintenance, and numerous other applications. Within the next two years, Bogue estimates that the network will carry from 700 to 2200 concurrent wireless connections on a sustained basis.

For the Leonard M. Miller School of Medicine at the University of Miami, Meru's wireless LAN technology has delivered a fully converged wireless network that supports anytime, anywhere access along with a broad range of voice, data, and video applications. By offering the industry's most advanced wireless LAN system, Meru is enabling Chris Bogue and his team to deploy one of America's most advanced wireless medical networks.



Meru Networks
Corporate Headquarters
1309 South Mary Avenue
Sunnyvale, CA 94087
P 408.215.5300
F 408.215.5301

www.merunetworks.com
info@merunetworks.com