

University Medical System Sees 6X Wireless Performance Boost

Cisco and Intel help University of Michigan Health Systems plan its migration to 802.11n to add capacity and coverage



EXECUTIVE SUMMARY
<p>UNIVERSITY OF MICHIGAN HEALTH SYSTEMS</p> <ul style="list-style-type: none"> • Industry: Healthcare • Location: Ann Arbor, Michigan • Number of Employees: 18,298
<p>CHALLENGE</p> <ul style="list-style-type: none"> • Expand wireless capacity to support transmission of large image files and electronic patient records • Protect investments in wireless technology while preparing for the next wave of mobility applications • Develop a plan for introducing next-generation wireless technologies in new buildings (now under construction)
<p>SOLUTION</p> <ul style="list-style-type: none"> • Partner with Cisco and Intel to help ensure a smooth evaluation • Evaluate and deploy an 802.11n next-generation wireless solution • Define a migration plan for all sites
<p>RESULTS</p> <ul style="list-style-type: none"> • Validated platform for emerging medical applications, new laptops, and existing medical devices • 6X throughput improvement, providing capacity for new services over wireless • Improved coverage for more reliable application delivery

Challenge

The award-winning University of Michigan Health System includes three hospitals, approximately 30 health centers and 120 outpatient clinics, the U-M Medical School and its Faculty Group Practice, the U-M School of Nursing and the Michigan Health Corporation. Two new hospitals are under construction, and UMHS has current projects for capacity and service improvements, and expansion work is ongoing at its Kellogg Eye Center and Brehm Diabetes Center.

IT has been challenged to grow the infrastructure to keep pace with the physical site expansion as well as the continual introductions of, and demand for, new medical applications. UMHS depends on a Cisco® wireless infrastructure for the support of mobile applications, with access now available in all patient care areas. This currently totals more than 5 million square feet, and will grow to more than 7 million square feet over the next two years. Today, more than 1500 Cisco access points support 3500 notebook clients, in addition to mobile blood-draw carts, ultrasound machines, electrocardiogram carts, handheld scanners for equipment check-in/check-out, and a variety of other applications critical for patient care. The wireless network also enables mobile applications for electronic record access, order entry, and other clinical solutions.



As wireless has become more important to the healthcare system, the technology limitations of the existing 802.11a solution have become more visible and challenging to overcome. UMHS needed to evolve its wireless LAN (WLAN) to:

- Meet the requirements for voice, data, and location services
- Support old and new devices (mixed radio types)
- Enable the introduction of new mobile services for mobile X-ray machines, location-based services, voice over WLAN, and others
- Allow wireless access for high-bandwidth applications such as the picture archiving and communication system (WebPACS) used by radiology.

Solution

With a Cisco wireless solution already in use for many years, UMHS has an established working relationship with Cisco. Seeing that the healthcare system was outgrowing its 802.11a solution, Cisco proposed a pilot deployment of 802.11n access points. The evolution of the industry standards for WLANs offered UMHS a higher-performance network as well as enhanced roaming capability that could deliver a more reliable coverage pattern for the breadth of mobile applications.

“The timing was right,” says Kalpesh Unadkat, the lead network engineer for UMHS. “We needed to pilot our high-bandwidth applications, and Cisco and Intel were ready with a joint 802.11n solution. In healthcare, we have to be especially careful about rolling out new technology. This pilot gave us the opportunity to work with Cisco and Intel to make sure that the industry standards were sufficiently evolved to handle our requirements without risking any negative impacts on patient care.”

“The best part about our project was how well Cisco and Intel worked together. They realize that wireless is a system; Cisco looks beyond its part, as does Intel, to make sure that everything works together, consistently and reliably.”

– Kalpesh Unadkat, Lead Network Engineer, University of Michigan Health Systems



The collaboration between Cisco and Intel was a critical part of the 802.11n solution for UMHS. Clinical applications rely on tightly integrated compute and network components, and applications must be tested on the combined platform. With support from both vendors, UMHS initiated a pilot test with Cisco Aironet® 1250 Series access points with 802.11n in one building. UMHS combined this with Intel® Centrino® processor technology with Intel WiFi link 4965AGN clients.

“The pilot test went very well, thanks to the joint work previously done by Cisco and Intel,” says Unadkat. “The best part about our project was how well Cisco and Intel worked together. They realize that wireless is a system; Cisco looks beyond the Cisco part, as does Intel, to make sure that everything works together, consistently and reliably. It’s been amazing, frankly. We completed our basic testing, and we now know that the new technology works. Our tests showed a 6X performance improvement compared to our previous 802.11a solution.”

Even in a mixed-mode environment, the UMHS pilot results indicate a 5X to 6X improvement in throughput, proving that an upgrade to the new protocol can provide the

capacity for higher-bandwidth applications. Testing also revealed improvements in response times by approximately 50 percent for wireless downloads of large files. The pilot delivered more predictable coverage, and there were no backward compatibility problems for the data and voice applications that were used to exercise the system.

Results

The successful pilot test has given UMHS the confidence to move ahead with 802.11n draft v 2.0 based solutions from Cisco and Intel. Increased capacity, better performance, and more reliable coverage will allow IT to support more and newer medical devices and new mobile applications such as Web Picture Archiving and Communication System (PACS) and mobile voice. Additional benefits of 802.11n include:

- Coexistence with the existing 802.11a WLAN: UMHS can deploy 802.11n gradually, starting with the new buildings that will be completed in the near future. The WLAN in the new buildings will not interfere with the older WLAN in adjacent buildings.
- Stability: The new WLAN will meet the service levels demanded for applications such as voice, and will help minimize disruptions for critical patient services that affect overall levels of care.
- Manageability: The new WLAN infrastructure can be managed from within the same management console currently in use for the existing 802.11a deployment.

These technical benefits directly affect the clinical staff as well as patients, since waiting rooms and other areas are enabled with wireless for guests and patients. Increased performance and stability mean fewer dropped connections and therefore increased satisfaction for both patients and the staff. Productivity will increase because clinicians will have shorter waiting time when transmitting large images or files, and will be able to access high-bandwidth applications from more locations on campus. From an operations perspective, the new WLAN will introduce more flexibility as IT will have fewer restrictions on applications based on bandwidth requirements.

PRODUCT LIST	
Wireless	<ul style="list-style-type: none"> • Cisco 1250 Wireless Access Points • Intel® Centrino® processor technology with Intel WiFi link 4965AGN notebook PC

“The new 802.11n solutions from Cisco and Intel have met our expectations, and eventually all of our wireless LAN will be upgraded to the new technology,” says Unadkat. “We recently got an award as the ‘Most Wired and Wireless Hospital.’ By continuing to pioneer wireless solutions within our healthcare system, we improve our reputation, and at the same time we give patients a better experience when they come to our centers.”

The 802.11n pilot underscores the UMHS’s commitment to delivering better patient care with their technology leadership.

For More Information

To find out more about the Cisco and Intel wireless solutions, go to: <http://www.cisointelalliance.com>

To find out more about Cisco wireless solutions, go to: <http://www.cisco.com/go/wireless>

To learn about Intel Wireless solutions, visit: <http://www.intel.com/go/wifi>

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