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Wireless Campus

By Susan Nunziata

Enabling caregivers to access crucial patient data at the point of care was the impetus for [Henry Ford Health System \(HFHS\)](#) to create an enterprise wireless infrastructure across its campus in Detroit.

That 2.1 million-square-foot complex treats 2.2 million patients per year

A two-story addition to the Henry Ford West Pavilion, slated to open in 2009, will add 80 private patient rooms and 20 intensive care unit (ICU) beds to the complex. The new construction is part of a five-year, \$300 million investment in HFHS's Detroit campus. HFHS is undertaking the deployment of a \$90 million electronic medical record (EMR) application, CarePlus Next Generation, that facilitates point-of-care access to patient data.



Further wireless LAN (WLAN) deployments are planned across four more HFHS campuses plus 20 outpatient clinics that together comprise an additional 3.1 million square feet.

Ahead of the Curve

In many ways, HFHS was ahead of the curve in using EMR. In the early 1980s, the organization built an EMR system that was green-screen, terminal-based. In the early 1990s, a graphic user interface was added. A workflow-enabled clinical application was later built, to manage care for patients with chronic illnesses.

Around 2005, HFHS decided to re-architect that application using web-based technologies, and extend it to include clinical orders management -- which enables staff to order tests and procedures on patients and track them through completion.

"The only way that becomes effective is if you get that technology as close as you can to the patient," explains Tim Purves, who until recently was CTO of HFHS. (Editor's Note: This interview was conducted in March 2008. At press time we learned that Purves left HFHS in July.) Options include workstations on wheels (WOWs), tablet devices and handhelds -- all of which need a reliable, pervasive WLAN.

"That was really the catalyst for driving our wireless infrastructure," says Purves. A [Siemens](#) WLAN was deployed throughout the Detroit campus. Its 125-bed ICU implemented the first clinical application -- [iMDsoft](#) MetaVision ICU -- to leverage the new Wi-Fi capabilities. So far, 40 WOWs have been deployed in ICU.

"That was such a great success that we're deploying an additional 75 WOWs to the general practice units," says Purves

Making It All Possible

The oldest building on the Detroit campus is more than 90 years old, with lead walls aplenty; meanwhile, new construction continues apace.

Wireless capabilities were previously limited to point solutions with scattered access points providing hotspot-type coverage. "We established our enterprise vision for what we wanted for our wireless capability," says Purves. Now, every "nook and cranny" of the campus is covered.

The facility had an aging SpectraLink deployment that it wanted to continue to use. "We wanted to leverage our investment across the total cost of ownership, and run voice technology across 802.11b/g," says Purves. Workstations and data devices leverage 802.11a and will eventually migrate to the "n" network for increased capacity.

A Methodical Process

The I.T. team was methodical about choosing a vendor, despite pressure from clinical departments eager for all the new wireless technology. Everything is mission-critical in the healthcare environment, so care needed to be taken in selecting a vendor for the wireless infrastructure. There's no margin for downtime; applications have to be accurate and reliable 24/7.

Vendors were evaluated in a two-part Request For Proposal (RFP). The first RFP excluded costs. "We purely looked at technology," says Purves.

Siemens was among the three finalists selected, and those vendors had a second RFP asking for additional information, including pricing details. Once again, the I.T. team saw only the technical information. After I.T. chose the solution they thought was the best, a smaller team looked at the dollars involved.

Care also was taken not to let an existing relationship between HFHS and Siemens influence the WLAN decision. In late 1990 to early 2000, Ford Health Systems had outsourced its voice and data network, as well as its entire data network operations and tech services to Siemens. (Application development was outsourced to Covansys, which eventually became part of Computer Sciences Corp.) A few years later, some functions were brought back in house, while the rest continue to be outsourced; the in-house I.T. team numbers 13.

Industry survey tools to determine bandwidth and signalling gaps for 802.11n are still in their infancy. So Siemens Managed Services technicians conduct manual surveys at the HFHS campus, which involves roaming with access points (APs) on poles to understand the attenuation between APs. "Designing for attenuation is challenging indoors given that the wireless signals bounce off walls and other building material," says Kevin Kujawski, Director of I.T. Strategic Planning. "Additionally, attenuation increases with the distance between access points. We had to ensure the design accommodated any other sources of interference."

The deployment encompasses 1,300 APs, 865 of which are wireless voice and data carriers, 497 wireless sensors, 232 Nortel 5520 PoE 1 gigabyte EDGE network switches, and 12 wireless controllers.

In anticipation of a future RFID tracking solution for everything from expensive equipment to basic gear such as gurneys, Kujawski says the APs and intrusion detection sensors can work together to function as location sensors. "Applications such as Ekahau can work the information from the sensors to help locate these key pieces of equipment," he says.

This spring, the hospital also started offering free wireless access for patients, and so far about 80 a day use the service.

While it's too soon for any ROI measures, customer satisfaction is a big driver. In fact, HFHS's business executives, as well as those on the front lines of patient care, are compensated in part based on patient satisfaction scores. The improved patient care enabled by the WLAN -- plus the ability for hospital guests to have easy access to friends and family via the network -- are already having a positive effect on customer satisfaction.

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