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Ohio Hospital to Install RTLS Covering 5 Million Square Feet

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Ekahau's system will enable the Ohio State University Medical Center to track assets, patients, employees and temperatures throughout its 40 buildings.

By Claire Swedberg

Jan. 13, 2009—The Ohio State University Medical Center will begin installing one of the United States' largest health-care real-time locating system (RTLS) deployments this month, using its existing Cisco Wi-Fi infrastructure and Ekahau Wi-Fi tags to locate assets and individuals. The system, which will cover more than 5 million square feet comprising approximately 40 buildings, will take about three weeks to install, according to Tuomo Rutanen, Ekahau's VP of business development.

Once installed, Rutanen says, the system will initially consist of around 1,000 asset tags, but within the next two years, a total of 15,000 Wi-Fi RFID tags are expected to be deployed, to identify and track assets, patients and staff members. The hospital will employ Ekahau Positioning Engine location software on its own server to pinpoint each tag's location within the facility, and to conduct business analytics based on that location information.

Chad Neal, OSUMC's director of technology

The hospital first began seeking a wireless locating system for assets approximately four years ago, says Chad Neal, OSUMC's director of technology. Originally, the facility looked into purchasing an RFID system that would include the installation of interrogators throughout its campus, in order to capture tags' ID numbers and pinpoint their locations. Such an installation, however, would be too time-consuming and expensive for a hospital of OSUMC's size, he notes. Installing a system in only part of the facility would be impractical, Neal says, since it would be an incomplete system that would lose sight of assets and people once they left the coverage area.

While OSUMC determined that a system leveraging the hospital's existing 802.11 Wi-Fi network would be the best solution, it also felt the technology lacked maturity at that time. Therefore, the medical center put its RFID plans on hold, waiting for the technology to become less expensive and more effective. In the meantime, it upgraded its Wi-Fi infrastructure, installing about 3,000 Cisco Wi-Fi access points and 30 network controllers across its entire campus.

In September 2009, the hospital then compared RTLS solutions from two companies, holding concurrent proof-of-concepts tests in which the two firms—one being Ekahau—competed. For each vendor, the hospital utilized 100 tags deployed on four floors in two buildings, then gathered metrics regarding the tags' read accuracy—for example, how long it took for workers to locate a particular tag after its icon was displayed on the computer screen, how close to the displayed location the tag was actually positioned, and whether there were any cases of "floor jumping" in which a tag turned out to be on the floor above or below that on which the software had indicated it to be located.

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According to Neal, Ekahau proved to have not only better accuracy—within 3 meters (9.8 feet), as opposed to the competitor's 5 meters (16.4 feet)—but also a good philosophy. He says that when he informed representatives of the competing vendor about the testing results, which included a comparatively high rate of floor jumping, "they felt that was pretty good." On the other hand, he notes, he much preferred the response of Ekahau's staff. Although Ekahau's number of floor jumps was significantly lower than the competition, Neal says, "they were horrified by the results." What's more, he adds, the company asked to come back in and recalibrate the system, "because they considered any floor hopping to be unacceptable." Ekahau was able to install the test system much more quickly than the competitor, he says.

Once the permanent system software is installed and tested within the next few weeks, Neal indicates, the hospital plans to initially begin using it to track infusion pumps and other high-value medical equipment. Each item will have a T301A Ekahau tag attached to it. The Cisco Wi-Fi nodes will capture each tag's unique ID number and transmit that data to a back-end server, where Ekahau's Positioning Engine software will calculate that item's location based on signal strength. The tags can also receive information, such as an instruction to emit an audible tone or beep as a warning, if, for instance, a specific item should not be used. Ekahau's XML API software can enable the hospital to set up its own business analytics based on specific items' locations, such as sending an e-mail or text message alert when an infusion pump leaves its zone, or when a piece of equipment gets mixed up with soiled linens and enters the laundry area.

After the medical center finishes tagging its high-value medical equipment, Neal says, the next phase of the installation will be to tag beds at the OSUMC's Arthur G. James Cancer Hospital, where beds are often moved from one room or department to another, and then to issue RFID-enabled wristbands to patients at the facility's Neuropsychiatric Hospital. Over the next few years, he says, OSUMC intends to use sensor tags to track temperatures in refrigeration units, as well as the temperatures of blanket warmers and in operating rooms; the software would send an alert to authorized employees if the temperature of a refrigerator, warmer or room fell outside of a predetermined threshold. The hospital also hopes to provide RFID-enabled employee badges with text messaging capabilities that could be displayed on the badge's screen, Rutanen says.

Designing the software to provide displays of the floor plan throughout the hospital is one of the biggest challenges, Rutanen says. Ekahau input hundreds of floor maps based on computer-generated drawings of the facility. "From a deployment perspective, it's a decent amount of work," he states. "Our expectation is to have it completed, from start to finish, in three weeks."

In the long term, Neal says he hopes to use the software to set up an alerting system that would enable the hospital to better plan the locating of staff members and equipment, based on patients' movements. However, he says, achieving this goal may take several years.