Hospital Tries ZigBee to Track Patients

To expedite the treatment of patients at its emergency department, Saint Luke's East-Lee's Summit, in Missouri, tracked patients by means of ZigBee-based RFID tags.

By Beth Bacheldor

July 21, 2006—A new hospital in Kansas City's metropolitan area has completed testing a radio-frequency location system to determine whether the technology could improve the processes involved in admitting and treating patients at the hospital's emergency department. Now, the hospital is gearing up to test RFID's value in tracking hospital staff and assets.

Saint Luke's East-Lee's Summit, located in Lee's Summit, Mo., and part of Saint Luke's Health System of 11 hospitals and many physician practices, tested an RF Tracking system that includes passive RFID tags, beacons and access points from InnerWireless, PanGo Network's PanGo Locator location management software and McKesson's STAR Patient Location Tracker, according to Saint Luke's CIO, Debe Gash.

"We wanted to determine how a radio frequency location system could be used to improve patient care and flow, customer satisfaction, and physician and clinician efficiency, as well as the potential ROI of such a system," says Gash.

During the test, which lasted for several weeks, patients were given 2.4 GHz RFID-enabled badges when they were admitted. The tags had ID numbers that were associated to patients when they were admitted, then disassociated when patients were discharged. The RFID tags inside the badges periodically "listened" for strategically placed RF transceivers, called beacons, each about the size of a residential smoke alarm, attached to ceilings in rooms, bays and hallways throughout the emergency center. The tags and beacons communicated with each other using ZigBee, which is based on the IEEE 802.15.4 wireless communication standard. The beacons transmitted this data to an engine that location engine that calculates room-level position, which was sent, via a standard Ethernet connection, to the PanGo location-management software running on a hospital server. The software filtered the data to eliminate redundancies and any bad reads, and then forwarded it to the STAR system, which hospital employees had already been using to track patients and the length of their stays, manage bed capacities and run historical reports to monitor productivity and performance.

The PanGo Locator software served as the middleware between the STAR and InnerWireless systems. "The data all comes out of the infrastructures differently, so Saint Luke's needed a system that could speak all those languages and translate them into a master language that the [STAR] application could understand," says Mike Braatz, vice president of marketing for PanGo Networks.

Saint Luke's Gash says the test revealed that patients did not mind wearing the RFID tags, but it's important to ensure patients understand why the tags are provided to them. "Patient location can improve satisfaction for customers to know where their family member is, as well as clinical-staff efficiency when they can definitively know where the patient is that they are planning to see," Gash says.

She says the system's accuracy provided room-level location "with a high level of confidence, but does require tuning to ensure that the RF location is truly where the patient is." She also noted that the hospital needed to more clearly define the processes in associating and disassociating the tags with the patients.

Saint Luke's East-Lee Summit is now planning to further test RFID for staff and asset tracking but declined to provide further details.