

The organization will attach Wi-Fi based active RFID tags to 5,000 medical devices, to help ensure equipment is properly serviced and available where and when it is needed.

By Beth Bacheldor

Oct. 24, 2007—[Carolinas HealthCare System](#) (CHS) is implementing an RFID-enabled real-time location system (RTLS) to track thousands of medical devices, such as infusion pumps and ventilators. The health-care network, consisting of 20 hospitals in North and South Carolina, is using the RTLS to help track the devices so they can be serviced at the right time, and to ensure they are available where and when they're needed.

The RTLS system leverages CHS' existing network of [Cisco](#) 802.11 Wi-Fi access points, which the organization has deployed throughout the hospitals for a variety of applications. These applications include the hospitals' computers on wheels, used to access patient information at the bedside or the point of care. The system also leverages [Ekahau](#) active 2.4 GHz RFID tags, which comply with the 802.11 protocol. The tags are powered by commercial, off-the-shelf, CR2 lithium batteries with an approximate shelf life of five years.

Each tag emits its unique ID number whenever it comes to rest following movement. Nearby Wi-Fi access points receive tag transmissions and forward them, via a wide-area-network, back to a central server located at the [Carolinas Medical Center](#) in Charlotte, N.C. The server runs Java-based Ekahau Positioning Engine (EPE) software, which analyzes a number of factors, including tag signal strength, to determine an object's location. According to Ekahau—which is based in Saratoga, Calif., with offices in Virginia, Finland and Hong Kong—the engine can track the real-time location of more than 10,000 objects on one server, and calculate up to 600 locations per second to within an average of 1 meter (3½ feet).

Each tag's unique ID number has been associated with information related to that specific device, such as its maintenance schedule and location, and housed on the central server. CHS employees with appropriate credentials can use a Web browser to access a real-time view of a tracked area, as well as the location of tagged devices in that area, or search for particular devices and their related information. For example, a technician can query the system using serial number or other descriptor to locate a device due for maintenance.

CHS started considering various RTLS solutions late last year, says Tuomo Rutanen, Ekahau's VP of business development. Once the organization decided on the Ekahau system, it conducted a pilot early this year at Carolinas Medical Center. Several months ago, Rutanen says, it began rolling out the system to all 20 hospitals. Once the rollout is complete, CHS will track about 5,000 medical devices.

"A lot of these devices are required to go through preventative maintenance," Rutanen explains. "This RTLS gives them the visibility to properly locate and maintain them." Knowing the devices' exact locations also enables CHS to keep the most appropriate inventory on hand to meet the needs of its

hospitals, and also saves time for doctors, nurses and other caregivers.

"They'll save time because they won't have to look for things," Rutanen says. "There is a big shortage of health-care workers in this country, and so anything you can do to make their lives—their work—more efficient, that improves care and ultimately accounts for the bottom line."

For now, Rutanen notes, CHS plans to use the RTLS to track medical devices, though the organization is exploring other ways to use the system. One possibility might be to employ tags to track hospital staff during critical processes to help document workflow.