National Instruments Overcomes Geography with In-Building Wireless Solution

CASE STUDY

CHALLENGE

For the past 30 years, National Instruments has been a technology pioneer and leader in automated instrumentation technology for test, measurement, and design applications. Headquartered in Austin, Texas, the company has more than 3,900 employees with direct operations in nearly 40 countries, and it sells products to more than 25,000 companies in 90 countries.

National Instruments' Austin headquarters campus includes three buildings: an 8-story building housing executive offices, conference rooms, and a training center; a 5-story office building, and a 2-story manufacturing facility. In all, some 2,500 employees work at the campus. Most of these employees have cellular phones, and the 8-story building's conference and training centers often host customers and sales people from National Instruments' worldwide offices.

"We have a lot of people who come to our campus for our training classes and sales conferences," said Kris Curtis, telecommunications specialist for National Instruments. "Cell phones are mostly a convenience for our employees who work here, but our executives and visitors need consistent wireless services for their cell phones and smart phones."

The problem is the geography. It is located in a small valley, and the all-glass buildings have energy-conserving film on their windows. As a result, signals from nearby external cell towers can't penetrate the interiors of the 8-and 5-story buildings, which are at lower elevations. (The two-story manufacturing plant receives adequate coverage.) "Even standing outside the two larger buildings," says Curtis, "the signal is about half strength, and once you walk into the building, you're pretty much cut off. If you're by a window on the upper 3 floors of the 8-story building and you happen to be facing the carrier's cell tower, you can make or receive calls, but the call can drop at any time."

INVESTIGATING SOLUTIONS

Since National Instruments didn't have a single contract with a wireless provider, the company knew that it would need to provide multi-vendor coverage inside its buildings. Curtis conducted a year-long process of educating himself about the range of available in-building coverage options.

"There are a lot of solutions out there, but many of them seemed like low-end products," he says. "Some wouldn't scale up to give us the coverage we needed throughout the building, some didn't have monitoring or other features we wanted, and some required a lot more hardware and antennas everywhere, so they seemed a lot harder to install." Ultimately, Curtis chose the InterReach Fusion SingleStar® system because it offered a unique combination of overall system simplicity (with one set of electronics supporting all carrier frequencies), uniformly high signal strength at each remote antenna, end-to-end monitoring (with Web-based access), and a low-cost, non-disruptive installation.

The Fusion SingleStar system includes a hub connected to the carriers' network (repeater or base station) at one end and to as many as eight remote antennas (or RAUs) which are placed throughout the building to distribute the wireless signals. One Fusion SingleStar hub can support 800/900MHz and 1900 PCS carrier frequencies, covering the range of signals used by major cellular carriers within the U.S.

FAST, PAINLESS DEPLOYMENT

For the first phase of the deployment, Curtis targeted the 8-story, 325,000 square-foot building. The deployment included three Fusion SingleStar hubs located in a fifth-floor equipment room, 24 RAUs (3 per 45,000 square-foot floor), and rooftop antennas that pulled in signals from nearby cellular towers operated by Cingular, Sprint, and Verizon. Thanks to Fusion SingleStar's use of standard CATV cabling to link its hubs with distributed antennas (or RAUs), the installation was handled by a local networking cabling contractor.

As with other Fusion deployments, the one at National Instruments has worked flawlessly from day one. "Everybody is very, very pleased that they have great cell signals everywhere in the building," said Curtis. Now, employees and visitors alike can maintain contact with their wireless voice and data services at all times.

NEXT STEPS

T-Mobile will be the next carrier to deliver coverage through the National Instruments in-building system. Unlike the other three major carriers, T-Mobile will be installing a micro base station instead of a rooftop antenna. The base station will be linked to T-Mobile's network via a terrestrial T1 line. Having a local base station will give T-Mobile the ability to closely monitor traffic and manage its service over the network, and it eliminates the possibility that high traffic from the National Instruments campus will draw too much capacity from the nearby external cell tower.

Down the road, Curtis is already investigating an expansion of the deployment to the 5-story office building. When this occurs, a new Fusion LS Main Hub will be contained in the 8-story building, and tie that into two Fusion Expansion Hubs supporting 16 RAUs in the smaller building using fiber between the buildings. This deployment will allow both buildings to be fed by the existing radio input sources (rooftop antennas and T-Mobile's base station) already provided by the carriers.

In the meantime, employees and visitors in the largest building at National Instruments' corporate campus in Austin can now stay connected via their cellular phones, PDAs, and smart phones; while workers in the 5-story office building have a solution on the near horizon.

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