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TESTING THE WATERS IN D.C.
May 1, 2008 12:00 PM, By Doug Mohney

Public safety communications officials take notice: The first phase of a pilot project designed to integrate new broadband technologies with existing public safety two-way radio systems went into initial use at the end of April.

The Radio Over Wireless Broadband project, known as ROW-B, is pairing push-to-talk capabilities over a 700 MHz cellular system with integrated location-based services in its first stage. It later will add a bridging interface to provide two-way communications between existing land mobile radio systems (LMR) and the push-to-talk network.

According to Luke Klein-Berndt, chief technology officer for the Command, Control & Interoperability Division of the Department of Homeland Security's Science and Technology Directorate, ROW-B represents an important step in advancing interoperable communications nationwide.

"By demonstrating interoperability between broadband technologies and an existing radio system, ROW-B will equip localities with the needed information to integrate new technologies with existing emergency response communications systems," he said.

Launched in fall 2007, ROW-B is a partnership among the DHS Office for Interoperability and Compatibility (OIC), the D.C. Office of the Chief Technology Officer (OCTO) and Clarity Communications Systems. "The partnership among DHS, federal agencies, local government, emergency responders and industry is fundamental to the success of this technology project," Klein-Berndt said.

It is an effort that leverages the District's pioneering and long-term investment in deploying a dedicated 700 MHz public safety network using commercial EV-DO cellular technology, the only one of its type in the world. OCTO declined to be interviewed, but it intends to provide public updates in May and June, likely including media events to highlight the continued need for pairing the commercial D Block of 700 MHz spectrum to spectrum in the band already allocated to public safety, which would provide the backbone for a proposed nationwide first responder broadband wireless network.

"D.C. has been a little bit ahead of the curve," said Robert Gurss, director of government affairs for the Association of Public Safety Communications Officials. "It could provide a good test bed for some of the technologies and applications for a national public safety broadband network.

"One of the benefits is they'll be trying some things out. No other agencies have their own wireless broadband network. The only way [other public safety organizations] can use wireless broadband is to be a consumer like anyone else, but commercial networks don't have the same amount of coverage, service, and availability that a public network needs to have."

Implementing the first phase of the pilot has been relatively straightforward, according to Bill Jenkins, vice president of product management for Clarity. "It's an Internet Protocol solution," he said. "It runs on the IP layer, so it does not require any complex signaling or connections into the infrastructure.

"We're providing a push-to-talk server cluster and a location services cluster … off-the-shelf server hardware running Unix," Jenkins added. "The device of choice is an Ultra-Mobile PC, a Windows XP-based device. Our client software, Where2Talk, runs on top of [it] and provides the push-to-talk communications capability, the location-reporting capability and the mapping capability."

Clarity needed to customize the Where2Talk client software — which the company expects to make commercially available in the third quarter of 2008 — for the UMPC device. The client can display a geographic map that pinpoints the device's location, as well as where all the other devices are, in real time.

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The cellular push-to-talk and touch-screen location combination creates incredible flexibility in public safety communications, far beyond teh capabilities of existing networks, Jenkins said. To make a push-to-talk call, one simply clicks the icon representing the device. Need an instant talk group? Circle a group of device icons on the screen and create one. Need a private conversation between a fire chief and a police chief? Click two icons, and they have their own virtual private channel.

Clarity's push-to-talk technology is a commercial product in use today by mobile network operators. "We offer hosted push-to-talk services that they can deploy in their facilities, or we offer a hosted push-to-talk system that they can access over a [virtual private network connection] over the public Internet," Jenkins said. "All they have to do is just deploy the handsets and connect to our hosting center. Our easternmost customer is in Bermuda; our westernmost customer is in Guam."

The UMPC provides a much larger display capability than a typical cell phone or PDA, with an 8.4-inch TFT LCD touch-panel screen with 800 × 600 resolution and 256 colors. GPS location capability is preconfigured, while an EV-DO Rev.?A modem card plugs into the device to provide broadband connectivity.

While the UMPC is designed to be carried by a person or sit in a vehicle, the same basic software client can run on a desktop Windows PC with an Ethernet connection to provide emergency dispatchers and supervisors with the ability to locate and communicate with dispatched units. In addition, the client application can be ported to a number of different devices and operating systems, including increasingly capable smart phones that have built-in GPS capabilities.

A DHS official familiar with the project cited the potential cost benefits of using commercial 700 MHz cellular hardware in the future as compared to traditional LMR equipment. For instance, a Project 25 (P25) radio can cost anywhere from $1000 to $5000. With several national carriers slated to buy a large number of 700 MHz smart phones in the coming years at a price point of $100 to $200 dollars per phone "even volunteer firefighters can carry them," the official said.

Increased device capabilities and better affordability comes with some trade-offs, however. "One of the things we're testing is battery life," Jenkins said. "You would not expect a UMPC to have battery life similar to a cell phone or an LMR handset. You'll have a much shorter battery life."

Another goal will be to gain more real-world experience with the GPS capabilities in an urban environment. While GPS systems work fine in open areas, taller buildings can create an "urban canyon" effect, blocking reception of satellite signals to a receiver at ground level.

Of course, testing is the point of the pilot. "One of the benefits of what D.C. is doing [is] they're providing insight of what could work on a broader basis," Gurss said. "It's a little bit of a chicken-and-egg problem. Unless you have technology and start to use it, it's hard to imagine what the applications are going to be. You can guess, but until you get there, it's hard to know."

Gurss and others are looking forward to ROW-B's second phase — scheduled to take place later this year — which will include a demonstration that links the 700 MHz cellular push-to-talk network to D.C.'s land mobile radio networks using the Bridging System Interface (BSI) standard developed by DHS and the National Institute of Standards and Technology's Office of Law Enforcement Standards. Another potential candidate for interoperability testing is the P25 Inter-RF Subsystem Interface (ISSI).

While ROW-B is being touted as a window to public safety's 700 MHz future, Clarity's solution is frequency-agnostic, according to Jenkins, who said the vendor is talking to a number of municipalities about the potential for porting Where2Talk onto existing radio networks.

"There's nothing in our solution that needs 700 MHz. We don't care," Jenkins said. "We can put this together for any band: cellular, non-cellular, 4.9 GHz, PCS and WiMAX and such. If it's packet data, we can operate on it."

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