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Improving Police Communications Across State and County Lines: The Piedmont Regional Voice over Internet Protocol (VoIP) Pilot Project

THE ISSUE

The Danville Police Department in Virginia experiences a unique crime problem because of its location along the North Carolina border. Police officers respond to crimes committed in Danville that often result in the pursuit of suspects across city, county and state lines. These frequent investigations, pursuits across jurisdictional boundaries and arrests have created communications challenges for the agency.

OVERVIEW

The Danville Police and surrounding law enforcement agencies (the Caswell County Sheriff's Office in North Carolina, the North Carolina State Highway Patrol, the Pittsylvania County Sheriff's Office in Virginia and the Virginia State Police) constitute the Piedmont regional partnership. The agencies have independent voice radio systems that provide satisfactory coverage and reliability within their jurisdictions. However, these radio systems are not compatible. As pursuits breached jurisdictional borders and radio coverage areas, officers and dispatchers historically were unable to communicate by using their "home" radio systems. Officers and commanders relied on a dispatch-to-dispatch telephone relay of urgent information, often originating from officers actively involved in pursuits. For example, a Danville police officer might have to radio information to a dispatcher, who would then pick up a telephone and talk to another dispatcher in an

adjoining jurisdiction. The second dispatcher would then radio the information to another patrol officer. The arrangement caused delays and increased the risk that vital information would be misinterpreted when it passed through so many people.

ADAPTING NEW TECHNOLOGY

Many leading manufacturers of data communications equipment are adapting products such as Voice over Internet Protocol (VoIP) systems to the needs of police departments. VoIP systems translate voice signals into digital form, allowing them to travel through the Internet, or private networks that use Internet technology, before they are converted back to regular voice signals at the receiving end. Many businesses and consumers now use VoIP for telephone service. In 2005, the National Institute of Justice contacted companies to identify potential trial programs that might solve the Piedmont region's communications problem. The goal was to assess the value of integrating VoIP with traditional radio frequency technologies to overcome some of the core problems of interoperability among and between law enforcement jurisdictions.

In response, the City of Danville and Cisco Systems, Inc., proposed an interoperable communications project using VoIP technology. The proposal gave NIJ an opportunity to assess an emerging technology that may improve law enforcement communications and to test the application of commercial communications tools to law enforcement use.

Danville and Cisco set up a VoIP system that connects area public safety land mobile-radio networks to an interoperable Internet network. The VoIP system lets people communicate from any Internet-enabled communication device (e.g., personal computers, VoIP phone) or from standard radio equipment. The VoIP system also offers a center-to-center VoIP intercom that provides a dedicated Internet connection between police dispatch centers. Using their standard console equipment, dispatch personnel can now communicate directly with one another, and more radio resources may be joined to the Internet network. A Danville dispatcher can talk and listen to field radio communications that span jurisdictions.

TECHNICAL SUPPORT

Cisco installed a computer server that runs its VoIP software in Danville. The company also provided network equipment to each public safety partner and created a private Internet network. Each public safety partner contracted with its own land mobile-radio company to help the VoIP technology link with radio interfaces.

The North Carolina State Highway Patrol installation is unique. Cisco engineered a break within the Internet network to meet NCSHP network security policies. At the break, digital signals are received, converted to voice signals, and sent a short distance before they are reconverted to digital signals. No Internet traffic can pass through this interface, thus preserving the Highway Patrol's security policy.

Cisco experienced significant difficulties and delays in linking the VoIP technology with existing NCSHP land mobile-radio resources. Aging radio and console equipment presented unforeseen technical challenges.

To resolve certain issues, Raytheon JPS Communications was consulted, and the company offered to donate some equipment to the partnership. This significant development allowed the participating companies to collaborate in creating a pioneering public safety bridging interface.

COLLABORATION

NIJ's CommTech program supported the pilot project by supplying personnel for observation and evaluation and providing technology support to the local public safety partners.

The project was based on a formal, written agreement between the City of Danville and Cisco, with communications links support provided by Sprint Nextel. This agreement defines the project and enables the regional use of an Internet-based technology to provide voice communications interoperability. In its role as honest broker and neutral observer, NIJ was not a formal partner and did not directly fund the project.

NIJ's efforts are focused in three key areas: governance, technology deployment and evaluation of VoIP technology. NIJ expects to publish further details about the partnership, governance and technical issues, and the results of formal exercises conducted by the law enforcement agencies.



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