

What is Datacasting, Anyway?

Datacasting, a truncated word derived from data and broadcasting, involves broadcasting data over a wide area via radio waves and may describe digital signals sent via television or radio. Television stations may use datacasting to provide information such as news, weather and traffic that may be unrelated to the programs with which the information shares spectrum.*

Stations may also partner with public safety agencies to provide information that could potentially save lives.

Allan Sadowski, IT manager with the North Carolina State Highway Patrol and a member of the Office of Justice Programs' National Institute of Justice (NIJ) Communications Technology Working Group, explains that there is growing interest in public safety agencies working with television stations to create datacasting partnerships.

"Every time there is a major incident or event such as an earthquake, a tornado or even a major sporting event, cellular systems get overloaded," Sadowski says. "Sometimes public safety radio systems (LMR) get overloaded too. When needs exceed system capacity — cellular or LMR — they can just stop working. But with a broadcast model, it doesn't matter if there is one receiver or 10 million. The data goes through."

Sadowski adds that a digital television signal may cover anywhere from 8,000 to 12,000 square miles, depending on the type of receiver antenna used, compared to typical cellular site coverage of 50 to 70 square miles.

"It's way more high-powered than anything being used in public safety today," he says. "And in rural, tribal, wilderness, maritime and park jurisdictions, where cellular coverage is often lacking, this could provide key alternative coverage. If you can get a TV signal, you can get information."

"It's an innovative way of using existing infrastructure at a modest cost," says Fred Frantz, director of NIJ's Communications Technology Center of Excellence (CoE). "It's

not going to solve all of our problems, but it's another tool in the toolbox that allows agencies to be able to move a large amount of data out to specific users at specific times for specific purposes."

Although the concept of datacasting has been around for many years, the idea of public safety and public or commercial television working together to broadcast crucial information is a relatively new one. The U.S. Park Police recently participated in a demonstration project (see sidebar, "Datacasting Solves Park Police Problems") and Clark County Schools in Nevada have successfully partnered with a local public television station to implement datacasting. Sadowski is working on coordinating further NIJ research and the CoE is assessing the potential for a future detailed evaluation. Frantz says that he thinks the public safety community as a whole is not very aware of the vast potential that lies in the use of datacasting.

"We've been trying to look at technology that falls outside the traditional methods of public safety communication, including datacasting," Frantz says. "We've made visits to places where datacasting has been deployed, including Clark County, where the schools have their own police department. If officers are dispatched to an incident in a school, they use datacasting to send them a package of current information on the building. This project grew out of a longstanding relationship between the station and the school district. For example, they support broadcast of certain classroom teaching to create a virtual high school for students who for one reason or another, such as illness, cannot attend in person. They've really found some innovative ways to work together."

If an agency is interested in datacasting, it needs to find a television station that is willing to join the project, and initial capital expenses are involved in setting up a system. Expenses relate to establishing a transmission control protocol/Internet protocol data feed at the transmission facility, plus supplemental devices to enable laptop and tablet computers to receive the information.

* Definition paraphrased from <http://en.wikipedia.org/wiki/Datacasting>.

DATACASTING SOLVES PARK POLICE PROBLEMS

July Fourth on the Mall in Washington, D.C. Being part of the event is the realization of a dream for many visitors, and coping with the logistics is an annual nightmare for the U.S. Park Police. However, after the agency's 2011 implementation of datacasting technology to share video, one logistical difficulty has faded out.

Prior to the annual Independence Day celebration, the U.S. Park Police and a Virginia-based technology services company, SpectraRep, launched a pilot datacasting project using spectrum provided by public television station WETA. The project enabled the agency to share video of the event with more than 25 other local agencies, and the Park Police quickly learned that datacasting solved four major problems the agency grappled with when using the previous system. As the pilot project wound down in early 2012, the Park Police began financial negotiations with SpectraRep to make the project a permanent one.

"We deploy tactical video for large-scale events or incidents, such as the Fourth of July, the Martin Luther King Memorial dedication and the August 2011 earthquake," says Capt. David Mulholland, technology services commander. "We previously set up cameras that communicated using the cellular infrastructure, attached to IP-based cameras or video encoders attached to a router in a cellular card. Every time we gave another user viewing access, the quality degraded until it reached the point where it became almost unusable. The fact that there is a lot of general cellular traffic going on at the same time just made it that much worse."

Because datacasting uses television airwaves, degradation is no longer an issue, so for the 2011 Independence Day celebration, Mulholland could provide access to all agen-

cies that had a public safety concern related to the event, such as the American Red Cross, the U.S. Department of Health and Human Services, and the National Center for Missing and Exploited Children.

Datacasting also does not limit the number of users from each agency, eliminating another problem with the cellular technology.

"During the last inauguration, we had a couple of video servers hooked into one camera and each could have 20 users," Mulholland explains. "I gave five agencies permission to allow one person to log into the video servers. They quickly discovered that more than one person could use the login at the same time, and when I went to log in myself, the stream was full because of unauthorized logins."

Other benefits derived from datacasting include freeing up more of the cellular infrastructure for other uses and the ability to immediately cut off a feed if circumstances dictate. Also, Mulholland says, if a terrorist attack or natural disaster took out the cellular infrastructure, datacasting could continue to provide video and other essential emergency information.

"It's been a very useful tool for us. We took the capability and ran with it," Mulholland says. "The end benefit to public safety is it allows us to significantly expand our capability for sharing information securely. The capabilities are phenomenal. It addresses all of our significant concerns and issues and we look forward to continuing to use it."

For more information on the U.S. Park Police datacasting project, contact Capt. David Mulholland at (202) 610-5282 or David_Mulholland@nps.gov.

Sadowski estimates costs for datacasting to be significantly lower than other communications solutions. Since datacasting can use an existing digital TV transmitter, the tower, antenna, radio frequency equipment, power and maintenance costs have usually already been covered by the broadcaster, he says.

A key component is the relatively inexpensive datacasting receiver hardware that allows officers to receive encrypted data. If you don't have the right encryption key, you can't unlock the data. That prevents unauthorized users from picking up law enforcement-sensitive information along with their stock market reports.

"The encryption can allow all officers to receive data such as Amber Alerts and stolen vehicle lists, or an investigator can call in to request specific information related

to a case that will go only to the requester," Sadowski explains.

"When the United States made the transition to digital television, the channel bandwidth did not change, but improved technology resulted in extra available capacity," Sadowski says. "The industry had a goal of allowing people riding in cars, trains, buses and so on to also receive TV signals via small handheld sets, which was the genesis of the technology that law enforcement can purchase and use to pick up signals. These devices have the ability to receive data much like as though they were connected to the Internet, so anything that can be found on the Internet can be broadcast on a television signal — video, audio, PDFs, spreadsheets, documents, pictures, even whole websites. Instead of just getting a

verbal description of a suspect's height, weight, and hair and eye color via a dispatcher's voice, officers can get a photo with datacasting. And any data received can be stored for later review if it comes in when an officer can't take time out to read it."

For more information on datacasting, contact Allan Sadowski at the North Carolina State Highway Patrol Technical Services Unit at (919) 662-4440 or allan.sadowski@ncdps.gov. For more information on NIJ's Communications Technology portfolio, contact Program Manager Joe Heaps at Joseph.Heaps@usdoj.gov. For more information on the programs of the Communications Technology Center of Excellence, contact Director Fred Frantz at fred.frantz@l-3com.com.



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