DHS Science and Technology Directorate

Datacasting—Broadcasting Real-Time Video and Critical Data over Existing Digital Television Spectrum

Creating More Public Safety Spectrum Options

In an emergency, first responders need timely and relevant data to make informed decisions. Land Mobile Radio networks are intended for voice communication and do not have the capacity to transmit large amounts of data. Commercial cellular networks can become overloaded or fail completely, as the network becomes saturated by public use. This leaves public safety agencies competing for the same network resources when trying to transmit their mission-critical information, especially video.

Although the First Responder Network Authority's Nationwide Public Safety Broadband Network is planned for the future, new and more effective ways to utilize bandwidth currently available for public safety need to be identified.

The Department of Homeland Security Science and Technology Directorate's First Responders Group (FRG) explored new spectrum options for public safety use through the piloting of datacasting technology. Datacasting uses existing broadcast television signals to deliver encrypted data to targeted recipients.

FRG; the Johns Hopkins University Applied Physics Lab; SpectraRep, an FRG commercial partner and several Public Broadcasting Service (PBS) television stations around the country led pilots to determine the benefits and limitations of datacasting technology for public safety use.

Delivering Encrypted Incident Response Data and High Quality Video to Responders in the Field

Sharing video and other data over existing public safety networks has been a challenge. When broadcast television transitioned from analog to digital broadcast transmissions, it created the opportunity to allocate television spectrum in new ways, including delivering encrypted and targetable computer data. This pilot takes advantage of a portion of the public broadcasting station's bandwidth normally used for television programming. Public broadcasting networks are a unique television partner given their public service mission. Datacasting reallocates a portion of their spectrum for transmitting video, data files and other critical incident information (e.g., building blueprints and live security video) to specific first responders anywhere in the TV signal coverage area without relying on or overwhelming other communication channels.

Safeguarding Data and Preventing Communications Overload

Datacasting is a broadcasting mechanism capable of one-to-many content delivery. For example, an unlimited number of recipients can be targeted without running out of bandwidth). This not only reduces congestion on commercial cellular networks, but it complements existing systems. Further, it allows public safety agencies to transmit encrypted video and data that is invisible to the general public through the digital television signal.

Once the hardware is set up at the television station to enable this capability, data recipients will need a datacast receiver connected to their computer in order to receive the information being broadcast from the PBS station. Datacasting's software allows the owners of the video and other data to target individual users or groups of receivers to receive the video, files and notifications being transmitted. These owners remain in control and can be selective about who should see video feeds and other information, even across various agencies and political jurisdictions. They also have full control over the information transmission and can even delete their data on remote computers at any time if a security breach is suspected, or a receiver is stolen or misplaced.

Next Steps

S&T conducted three pilots of the datacasting technology with the cities of Houston and Chicago and released test reports with information on how it was used and what capability gaps it filled. The reports can be accessed on https://www.dhs.gov/science-and-technology/first-responders. The technology was used during several major events in Houston and will continue to be used to support day-to-day activities. S&T is looking to identify another public safety partner for fiscal year 2017.

To learn more about Datacasting, contact SandTFRG@hq.dhs.gov.

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