

PBS to the Rescue

BY ANN LONGMORE-ETHERIDGE

IN 2011, SUFFICIENT BANDWIDTH—shorthand for saying you have the transmission capacity to send whatever amount of audio, video, or text data you need to—is arguably more valuable than gold. This is especially true in a crisis, when communicating is vital. But because everyone wants to communicate with someone at the same time during an emergency, the demands placed on communication systems often exceed overall capacity. An organization that needs to get critical information to emergency services, police, and other first responders fast needs to know it will get priority and won't just get the modern version of a busy signal. Thanks to an innovative program initiated by the Vegas Public Broadcasting Service (PBS), the Clark County, Nevada, School District is assured of the bandwidth it needs to communicate emergency incident information digitally direct to school officials and the school district's police. It's free to the schools, and it could serve as a model for others around the country.



The system is called IncidentOne, and it was developed by SpectraRep. SpectraRep is a subsidiary of BIA Financial Network, Inc., a strategic and financial advisory services firm that serves the media, technology, entertainment, and communications industries.

“We come from a broadcasting perspective. BIA started [SpectraRep] to help digital television stations figure out what new, different, and exciting things they could do with their digital television signals that they couldn’t do before in the analog world,” explains O’Brien.

“We started focusing on public safety about five years ago...because of the bandwidth needs of the public-safety community to distribute video and data and large files,” he says. “The ability of digital television signals to do that is pretty straightforward.”

District in the Desert

Nevada’s Clark County School District is one of the top 10 largest in the United States. Located in the Mohave Desert, the school district covers 7,910 square-miles and includes within its purview Las Vegas, Henderson, Boulder City, Mesquite, Laughlin, Searchlight, Blue Diamond, and close to a dozen other towns. Divided into seven regions, the district operates 352 elementary, middle, and high schools, as well as other special program facilities.

Clark County School district has about 309,000 students. It also has its own police force.

The county itself is about the size of New Jersey. “It includes mountainous areas, open desert areas, denser population areas, and metropolitan Las Vegas,” says George J. Molnar, the chief engineer at Vegas PBS. “Fortunately, because there are mountains, our television station reaches almost all of it.”

In the lead up to the changeover from analog to digital television signals, Vegas PBS decided that “our mission plan would be toward community service,” he says. In 2006, two years before Molnar joined Vegas PBS, the station and the school district were approached by SpectraRep’s O’Brien with a way to pursue that mission.

O’Brien explained that the company was developing a datacast software pack-

age that would allow the school district to receive wireless emergency communications via the digital signal that Vegas PBS broadcasts.

“We said to them, ‘We know the things that you’re struggling with,’” O’Brien states of the situation as it was then: a limited ability to get information to school district police in the field and little confidence that existing emergency communications systems wouldn’t be overwhelmed in a large-scale emergency.

O’Brien explained that the datacast software could allow for the transmission of real-time, up-to-the minute data to emergency responders anywhere in the county that could pick up the Vegas PBS signal, including as many or as few as the school district police department wanted—potentially even to just one police vehicle.

“Public television covers 97 percent of the United States,” O’Brien says. “Millions of dollars have been invested in building out the television stations and going from analog to digital. There is an unbelievable untapped resource just sitting there.”

That resource is the ability of these stations to send data out with the trans-

mission of regular programming, unnoticed by the general public. “If public-safety entities need to send high-quality video to 1,000 people, no problem. To one person? Fine. This is a novel way to address the bandwidth concerns of public safety, and it’s replicable anywhere in the country,” says O’Brien, adding, “but it is almost unknown, which has been our challenge.”

According to Molnar, the Vegas PBS engineers were impressed with the idea of using the unused bandwidth hidden in the public TV transmission, as was the school district. For startup funds, the station applied for and received a grant from the Corporation for Public Broadcasting. Subsequent grants for operating costs have been obtained from Readiness and Emergency Management for Schools and other federal grants, he states.

Together, says O’Brien, SpectraRep and Vegas PBS “wrote the backend software” and put equipment into the station. “Then we talked to the school police department about the problems it wanted to solve and what it needed, and tailored the system for them. Obviously, there was a lot of customization involved,” he says.



THE DATACASTING SYSTEM was used to provide information for the Secret Service when President Barack Obama held a town hall meeting at Green Valley High School.

How it Works

IncidentOne operates on a Windows server system. The main servers are located at the TV station, with a redundant server at the school district police department. The IncidentOne servers are networked with and can draw data from all the other relevant servers in the school district where blueprints, crisis response plans, student records, medical records, faculty records, aerial photos, and other data are kept.

The servers are controlled through a Web front end. School district police dispatchers working in the dispatch center can sign into the system via that front end and chose what information is sent to the central server. It’s like filling a bucket, Molnar says. The contents are then “encapsulated and multiplexed with our existing digital television signal,” which then transmits it to the field, he states. Molnar notes that the IncidentOne datacast system uses only a small amount of the bandwidth that Vegas PBS has available.

At any given moment, “Any bits [of Vegas PBS’s television signal] that aren’t being used to create picture or sound are assigned to digital broadcasts of emergency information...and an authorized receiver can pick it up,” he explains. “Yet it is completely invisible to public viewers.”

End users. There are currently about 90 authorized recipients of the datacast system information, including school district police. All recipients have a receiving unit at their station, desk, or police vehicle. Installation was simple, says Molnar.

That unit consists of hardware and software, plus an antenna and receivers on the cruisers and a link to the officers’ laptops.

Anyone receiving the information sees a popup box on the Windows desktop and hears a chime signaling a new incident. The user clicks on the box and “it opens a file browser which includes the bucket of all info we have available on the incident,” Molnar says.

“If there is a situation at a middle school, dispatch will queue up all the info about that school—the floor plans, emergency response plans, and contact lists, for example, as well as whatever student and

SYNOPSIS

Thanks to an innovative data transmission program initiated by the Vegas Public Broadcasting Service (PBS), the Clark County, Nevada, School District can now send up-to-the minute information in a crisis to emergency responders anywhere in the county; they simply need the ability to pick up the Vegas PBS signal. The school district’s police department can direct the transmission to specific responders or to all of them.

The datacast, called IncidentOne, operates on a Windows server system that draws from all the other relevant servers in the school district where blueprints, crisis response plans, student records, medical records, faculty records, aerial photos, and other data are kept. The system also can be used to broadcast live footage from school CCTV cameras.

During the two years in which the datacast system has been operating, continual adjustments and changes have been made and the system has been upgraded once. For example, medical records were added to the types of information that could be transmitted; also added was a list of fragile students in need of special attention in an evacuation.

SpectraRep, the company which developed IncidentOne, performed an upgrade less than a year ago that allowed for better crowd management at incident scenes. The school police department’s emergency response command vehicle was fitted with electronic bulletin boards that can be updated by dispatchers using the television signal, and they can also broadcast audio to people who are in the immediate area.

A U.S. Department of Justice grant is funding another upgrade this year that will allow police officers to define, in some cases, the type of information they want and leave out information that does not need to be broadcast.

After the upgrade, Vegas PBS hopes to expand the datacasting to more emergency service agencies and possibly the casino industry.

staff information is needed,” he explains.

CCTV. The system can be used to broadcast live footage from school CCTV cameras. “The school district has thousands of cameras, and we can provide a stream of video to any responding officer,” explains Molnar. “The dispatcher has a CCTV interface...that is tied into our datacast servers, so [the feed from] whatever camera is selected is streamed live as part of the datastream.”

He adds a quip, “The nice thing about digital TV is that it’s ones and zeros, and it doesn’t care if we’re sending out Barney or a school CCTV camera. Whatever it is, it just goes out in that stream.”

Molnar, who took charge of the system in 2008, says that on several occasions, camera footage from inside a school was used to ascertain whether a “Columbine situation” might be about to occur. “Fortunately, nothing happened,” he states. The suspicious person turned out to be

unarmed and not contemplating trouble. But being able to quickly assess the situation helped.

The datacast system’s ability to stream live CCTV has also helped during adverse weather. Late last year, heavy rain caused flooding at some schools. According to Molnar, the school district used feed from cameras at the schools to determine the situation on the ground. Additionally, some Clark County schools are designated as emergency shelters for the local population. Viewing the live stream helped emergency response agencies determine whether the shelters were safe to send people to.

The system is regularly tested—about once a month, according to Molnar—and has been used frequently. One “major use,” he says, happened on February 19, 2010, when President Barack Obama held a Town Hall Meeting at the district’s Green Valley High School.

“We activated the datacasting system and provided floor plans, contact lists, aerial photography—everything we have in our archives—to...the Secret Service and other agencies responsible for the event,” Molnar says.

Vegas PBS also has a data-sharing arrangement with the Las Vegas Metropolitan Police Department. “We do share information with them subject to appropriate privacy regulations,” Molnar says.

Learning Curve

Since the datacast system began operating, continual adjustments and changes have been made. The system has been upgraded once and will be again later this year.

“We’ve really learned a lot about how to tune a user interface to make it work more smoothly for dispatchers and for the officer in the vehicle,” Molnar says. More types of information have also been added.

For example, they didn’t have the ability to access and include medical records at the launch. Additionally, they didn’t have the ability to provide a list of students who need special attention during an evacuation.

“If there is a school evacuation, we don’t want to have kids without their pills or whatever medications they need. So we added that to the system, realizing it was a shortcoming,” says Molnar.

In addition to those changes, Spectra-Rep performed an upgrade less than a year ago that allowed for better crowd management at incident scenes. It had to do with the way parents respond in an emergency.

The school police department operates a large emergency response command vehicle. The vehicle operators were frequently hampered in their work by concerned parents.

“They leave work and come to the school, saying ‘That’s my kid in there! I have to get my kid!’ The operators were spending all their time telling them, ‘No, you can’t. You have to stay here. We’re managing the incident,’” says O’Brien.

“We came up with a way to help them by taking the same technology we already had in place and layering on some

capabilities. We put electronic message board signs on the sides of the command vehicle and gave dispatchers the ability to use the same television signal to update information on those signs and broadcast audio to people who are in the immediate area,” O’Brien explains.

“So now the operators just say, ‘Read the sign, listen to the announcement, and you’ll know everything you need to know.’ It’s worked out well,” he says.

Most recently, a grant has been obtained from the U.S. Department of Justice for another upgrade. Molnar says that the new version of the IncidentOne software now being prepared will allow units in the field to “select what they want to see—more granular information.”

For example, a police officer coming to a school about an issue involving a particular student can obtain relevant information, such as that student’s class schedule, picture, and other pertinent facts rather than just getting a mass of information that has no bearing on the situation at hand. In other words, the officers can pull out data from the servers, rather than only being authorized to receive data being sent by a dispatcher.

Vegas PBS notes that it still has plenty of bandwidth and would like to expand the datacasting service beyond the school district, making it available to other area emergency response agencies. ■

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