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Dallas Police deploy BridgeWave's high-capacity wireless links

Written by Gregg Levin

The Dallas Police Department continually evaluates the latest technology as part of its ongoing efforts to use the best practices available to law enforcement for deterring, detecting and investigating crime while also focusing on the betterment of overall public safety in the nation's ninth largest city.

A cutting-edge public safety solution combines the latest wireless innovations as part of an ongoing effort to reduce crime in "hot spot" areas within the downtown freeway loop where many businesses, tourist, residential and entertainment venues are located. The Dallas Police Department, which includes about 3,000 police officers and 500 civilian employees, embraced the next-generation video surveillance system after the success of its video pilot project in 2005.

Initial efforts were focused on monitoring activities during peak entertainment hours in the popular Deep Ellum section of Dallas. The results were astounding, with substantial reductions in both violent and non-violent crimes over a four-month period. The department then set out to expand the initiative with the goal of focusing on the highly active downtown areas. Early in 2006, a grant from the Meadows Foundation, an in-state private philanthropic institution, supplied the impetus necessary to acquire and deploy an expanded state-of-the-art video surveillance system.

Several months later, the Dallas Police Department issued a request for proposal (RFP) for a turnkey video surveillance solution. The plan was for elements of the system to be installed on utility poles and building facades about the city's central business district.

During the research phase, municipal officials thought the city's existing wired network infrastructure could serve as the backbone for carrying the video traffic to 24-hour monitoring stations at City Hall and Jack Evans police headquarters. They quickly discovered, however, that additional bandwidth was required to deliver large video files. In addition to meeting the steady and heavy demands of video, they also required maximum image clarity. Law enforcement officials needed to read license plates from 300 yards away, and night-time monitoring was of paramount importance. They also needed to be able to view different camera angles without any time delays.

The challenge was intensified because the solution not only had to deliver high throughput, but it also had to scale quickly and easily so the department could add more cameras and locations whenever possible. Over time, the Dallas Police Department planned to expand the video surveillance system substantially, so they needed to be able to grow significantly without any drop in image quality or speed of delivery. The network had to provide the same performance if 20 or 40 officers were monitoring videos at the same time.

The Dallas Police Department reviewed proposals from six integrators before selecting the finalists. While assessing the top three bids, department officials chose the solution suggested by Bearcom, a nationwide provider of wireless communications equipment and solutions that happened to be based in Dallas. "Initially, we didn't approach this project with wireless technology in mind, but the advantages of Bearcom's approach were obvious," said Tom Lawrence, the deputy police chief for the Dallas Police Department. "They proved we could deploy a self-contained public safety network without overhauling our existing infrastructure. [Bearcom](#) also recommended the best overall solution for a scalable network backbone featuring both substantial bandwidth and security for handling video streams."

Bearcom's plan consisted of a blend of the latest wireless innovations, including IP video cameras,

multi-radio mesh network nodes as well as high-capacity, gigabit Ethernet and 100Mbps backbone links. For the wireless cameras and networking technologies, Bearcom chose [Sony Electronics'](#) multi-codec IP cameras with single- or dual-streaming codec modes, advanced motion detection and day / night functionality for the highest image quality in all conditions. Fast and flexible mesh network nodes from Firetide Inc. are used to link the Sony cameras wirelessly, which eliminated the high costs and difficulty of connecting cables to each camera. Video traffic is aggregated and then backhauled to the monitoring stations using BridgeWave's high-capacity 60GHz point-to-point gigabit and 100Mbps wireless links. Each BridgeWave wireless link carries traffic for up to 10 video cameras in hub-and-spoke as well as repeater configurations.

Bearcom completed the first phase of the Dallas Police Department's video surveillance system at the beginning of 2007. Included was the deployment of 40 Sony video cameras, 35 Firetide mesh network nodes and seven high-capacity BridgeWave backhaul links. The wireless video surveillance system operates on the secure 4.9GHz frequency used for public safety applications, which ensures interference-free communications. Another advantage of backhauling with BridgeWave's 60GHz links is they let the Dallas Police Department conserve low frequency spectrum for other public safety applications."

Our goal is to reduce crime in major downtown areas by 30% within the first six months of installing the new video surveillance system," Lawrence said. "The central business district is essential to the economic success of our city, and the Dallas Police Department is committed to using advancements in wireless IP video and networking to make downtown safer."

The wireless cameras and radios are put on "portable pods," which can be redeployed when needed to assist with increased monitoring capabilities during special events or in case other downtown areas require surveillance in the name of public safety. "The small form factor of both the cameras and the wireless radios offer a big advantage since it provides the flexibility to move the cameras to other downtown areas as needed," adds Lawrence. The BridgeWave radios allow direct attachment of cameras through their additional "add / drop" copper Ethernet port, which enables rapid, streamlined installations.

The Gigabit wireless links offer a "future-proof" solution because ample bandwidth is available to meet both existing and growing networking needs. For the Dallas Police Department, full GigE bandwidth offers a scalable, expandable backbone to support its plan to more than triple the number of cameras over time while ultra-low latency performance ensures real-time pan, tilt and zoom camera control.

Around-the-clock remote monitoring of the video camera is enhanced by the ability to quickly change the direction of the camera lens. With BridgeWave's ultra low-latency backhaul technology, real-time pan, tilt and zoom control of remote cameras is easy.

"Our officers and public safety staff have been impressed by the image quality in all light conditions as well as the ease with which they can zoom in for a closer look at street-level activity," Lawrence said.

At this time, the video surveillance system covers about one-third of downtown Dallas. The results have been so outstanding and noticeable that leaders from the community and local businesses are supporting continuing expansion. Plans currently call for more than tripling the number of cameras while expanding the wireless video surveillance system to other areas of Dallas when funds become available. According to Lawrence, "With BridgeWave's high-speed, secure wireless links, the Dallas Police Department has gained a 'future-proof' network backbone that can scale to meet our evolving bandwidth requirements while helping us make downtown safer for our residents, businesses and visitors."

Gregg Levin is a co-founder and senior vice president of product operations at BridgeWave, based in Santa Clara, Calif. He previously served as executive vice president and CTO at Wireless Inc., where he created the industry's first megabit-speed wireless access router and U-NII Ethernet bridge. He also worked for Hewlett-Packard leading the development of internetworking products for Unix server and workstation product lines. He can be reached at greggl@bridgewave.com

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