

# SECURITY Technology & Design

## IP Case in Point: Scaling Surveillance with Network Video

When a Texas school district needed surveillance, networked video fit the bill

By Fredrik Nilsson

**O**ur nation's schools should be a safe zone where students and educators feel secure learning and teaching in a crime-free environment. One way to ensure that level of security is to proactively implement a surveillance system that meets present security standards and anticipates future needs without disrupting the educational process.

The Northside Independent School District in San Antonio, Texas looked for a surveillance system that could easily and quickly scale to fit their ongoing safety and security needs. District administrators found a network video solution to be the right choice over an analog closed-circuit television (CCTV) system because of the flexibility it provided. Before coming to this conclusion, the school district had to undergo an analysis to understand the extent and nature of its security issues and identify security gaps from school to school.

### Making Sense of It All

The Northside Independent School District is comprised of 12 high schools, 14 middle schools and 57 elementary schools. In addition, a new middle school is planned for later this year. One of the school district's first steps in assessing security needs was to review existing security measures and systems at each of the high schools.

Overall, district officials found disparate systems that were inconsistent and inadequate. Some high schools had a few cameras in place while others had none at all, and the cameras in place were being used varied in capabilities. Most importantly, the cameras were not used strategically to maximize performance. In addition, each school used different vendors with different maintenance contracts, making it very difficult to manage and support at the district-wide level.

The Northside Independent School District decided it was time to start fresh and went to the local community for support. A school bond package was presented to voters and received overwhelming approval. With the necessary funding in place, the district moved forward investigating video surveillance and access control options available to achieve their primary goal of ensuring the safety and security of students and staff. They also knew they wanted an updated system that would provide district police after-hours support in response to alarms and suspicious activities and/or thefts. The school district also wanted to be able to use video to help identify perpetrators and to monitor staff access control systems in order to ensure appropriate access was granted to personnel entering school facilities.

In addition, the Northside Independent School District wanted a surveillance system that was centrally supported. School officials wanted school police to be able to remotely view video from the district's police station at the same time the video was also accessible to the Central Office administrative officials.

In reviewing their options, school district leaders felt it was an opportune time to leverage their robust Gigabit Metro Area Network (GigaMAN), which connects local area networks (LANs) in a metropolitan area using fiber-optic Ethernet connections. After careful analysis and research, district officials decided their needs could be met by an IP-based system.

### One Down, Eleven to Go

LenSec, an industry leader in developing highly scalable and web-based, custom surveillance solutions, was selected as the total solution provider for the network-based surveillance system. During the summer of 2005, standard design criteria was created by a cross-functional team comprised of facilities staff,

technical services staff, district police, a risk management team and campus administration from John Jay High School, the test school for the entire system.

Cameras were placed in hallways, at every perimeter door, in the cafeteria and gymnasium, and on the exterior walls of the campus buildings to provide coverage of the campus grounds and outside walls, as well as views of the parking lots. Privacy was considered, and no cameras were placed in bathrooms, changing areas, or within classrooms. The intent was not to monitor students all day, but rather to troubleshoot and provide support to campus and district administration, as well as district police in the case of an incident.

Staff access controls became more effective when used in conjunction with the network-based video surveillance system. Cameras were programmed to record whenever staff used a proximity badge to access the building outside of normal school hours. Some cameras were activated by motion detectors enabling police at the central monitoring station to view and respond to situations at a moment's notice. In addition, the monitoring functions were laid out on a view of the floor plan so security staff had the ability to see exactly where a camera was recording video from and thus providing a more effective response to an incident.

The pilot system was installed at John Jay High School in August 2005. A 60-day operational test was implemented immediately after the installation, allowing officials to make necessary tweaks to the system while updating school policies and procedures before the start of the school year.

## Scale to Success

The pilot system at John Jay High School was easily duplicated because the staff took the time to develop a design guide for the deployment, and the technology itself used to support the system infrastructure. The cameras were connected to campus servers by Ethernet cabling, allowing all camera feeds to be monitored from virtually any location on the network. The Northside Independent School District took full advantage of the network, and created nearly identical network video systems in 10 of its high schools within the course of one year. Using the existing infrastructure was an added advantage for the technical services team as they were already familiar with the inner workings of the system.

Cabling the facilities to provide power and an Ethernet connection for each camera took the longest amount of time. The installation team took advantage of spring breaks and after-hours to complete the work. Once one school had been cabled, it would take one to two weeks to install all the network cameras on the campus. Because each school followed the same design criteria and camera locations were planned well in advance, the process was quick and consistent throughout the school district. While Power-over-Ethernet (POE) cameras are available, they were not used in this installation. Future school installations and system updates will utilize POE camera solutions, reducing the amount of cabling and time per installation.

With more than 1,000 Axis network cameras and 20 servers for video management being installed, a network-based system was clearly the most convenient option for an expansion of this size. The total solution, including equipment, video management software, Open Options central monitoring software, and installation were all provided by LenSec.

## The Right Choice

An installation of this size is not possible within the same time-frame and budget if the District installed an analog system. Network video systems are far more flexible than analog systems in terms of camera capacity, server capability, expansion and growth.

For example, with analog CCTV systems, digital video recorder systems (DVRs) used to digitize video dictate, to some extent, how many cameras can be used. DVRs are typically equipped with four, nine or 16 camera inputs, meaning an additional camera beyond the specified inputs requires an additional DVR. On the other hand, network video systems work independently of DVRs through PC servers, so there are not the same constraints.

Servers can easily accommodate any number of cameras depending on the image quality required for the system. For example, 300 cameras can be managed by one server if two frames-per-second (fps) is considered adequate. In the case of the Northside School District, each server accommodated 60-65 cameras with one frame-per-second archived on the server. Because the district installed a network video system, they were not bound by the available number of camera inputs and could purchase and install network cameras regardless of the number of available ports.

Managing footage is easier with a network system because it is centrally stored. Footage is easily retrievable and has the capacity to handle large storage needs. The district recorded all of its footage on servers at each campus. An analog system would have likely proven to be overwhelming because each school would have had several DVR systems, each requiring backup maintenance and creating challenges with central monitoring of video across a school district.

## Making a Positive Impact

Thanks in part to the installation of a more advanced network video system, the Northside School Independent School District has seen a decrease in discipline issues throughout its high schools. As a result, the District hopes to expand the system even further in the near future.

On May 12, 2007, voters overwhelmingly approved a 2007 School Bond Package to extend the network-based surveillance system into all middle schools. The system will be scaled throughout its facilities and will duplicate the new systems currently being used in the high schools. In addition, a future Bond election could include plans to expand the system through the District's 57 elementary schools.

The Northside Independent School District's choice to utilize a network-based system has allowed them to build out a successful surveillance effort within their high schools to support the safety and security of their students and staff, and has left the door open for easy expansion and growth with existing and new schools in the future.



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