

Pueblo School District 60

NextLAN CAT 6+ and Premium Fiber Cabling System Chosen for Extensive Infrastructure Upgrade

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During the school year, Pueblo School District 60 is responsible for educating more than 17,000 school children that live inside the city limits. In 2003, an impressive project was launched to wire 39 district-owned sites with a new copper LAN (Local Area Network) and replace its antiquated copper network that interconnected all the facilities with a new fiber optics WAN (Wide Area Network). The two simultaneously constructed projects, phased in over the next two years, created a new robust communications infrastructure that facilitated the expanding voice and data needs and left the district with enough headroom to creatively develop its curriculum.

performance without compromise

In a time when most homes have one or more computers and children as young as four often can maneuver around the Internet better than their parents, school systems no longer have the luxury of simply providing a basic education in the classroom. Electronic chalkboards, PC-based educational software, subscriber-based programming (i.e. Cable in the Classroom) as well as Web cams and long-distance learning via the Internet are just a few of the technological advances that are prompting educators to change the way they teach. This, coupled with the need to create and access a broad array of centralized data faster, is compelling school systems to install or update existing high-performance structured cabling infrastructures.

PUEBLO SCHOOL DISTRICT 60

In the southern Colorado City of Pueblo, School District 60 painstakingly maintains detailed documentation on each and every student such as immunization records, standardized test scores, report cards, emergency contact information, class schedules, etc. In addition to student records, also kept are facilities and transportation maintenance files, equipment inventory, operational records (policies and procedures), personnel records, and more. With so much stored information, it became virtually impossible to quickly access paper records and the decision was made to switch to a primarily electronic filing system. That was more than 12 years ago.

Since then, the district's network has slowly grown to facilitate computers, printers, educational software programs, cable TV. Unfortunately, the aged infrastructure has not been able to keep up millions of data bits being retrieved and transmitted daily.

"We were being so severely constrained on bandwidth that there physically was not enough bandwidth in the entire network to support the data traffic or add any new programs," said Frank Klein, Assistant Superintendent of Technology, Pueblo Schools District 60.

Recently, it became apparent that the communications infrastructure was obsolete. Additionally, the cost to maintain and operate the network had grown to such a level that it was financially impractical to attempt further upgrades. A fresh start was needed, and it was found with NextLAN products from Superior Essex and Leviton.

THE CHALLENGE

When the decision was made to replace the aged network, the district turned to Jacobs Facilities Inc, a veteran cable plant management services contractor that offers Consulting, Design, Engineering, Installation, Maintenance,

Cable Plant Documentation, Outside Plant Construction and Infrastructure Services. Before the first run of cable was laid, Jacobs considered the size of the project, the age of the buildings, installation constraints, and how to best select a structured cabling infrastructure.

Stretching across an area of more than 40 square-miles, District 60 includes 22 elementary, six middle, five high schools, four charter schools, a data center, maintenance services building and the central office. Of the 39 sites, all but two – the new elementary school and new data center – had to be retrofitted with new copper wiring. The two new buildings were installed with copper cabling during construction. For scale, the school buildings are anywhere from 38,000 to 302,000 square-feet in size and some campuses house multiple on-site buildings. Additionally, some schools are more than 100 years old.

Pete Montoya, Project Manager with Jacobs, explained, "At one campus, we had a high school that was a 100-year-old, five-story, two-hundred and eight-nine thousand square-foot building. It had a physically-detached gym and another building across the street that was connected through a tunnel. Because we were dealing with some very old, very mammoth-sized and very spread out facilities, we had to deal with routing issues that didn't always allow us to take the most direct path to the end-user."

To find a cabling solution, the technical merits of nine channels were tested in a head-to-head "bake off." Each channel, in multiple configurations out to 30 and 100 meters, was tested for performance. Both the outstanding performance and available headroom for the NextLAN products shown through during the simulations. The NextLAN configuration consisted of the eXtreme® 6 patch panel and jack and DataGain® cable.

From the simulations, the district wanted to know:

- » Did the cable solution meet the standards for CAT 6 cable?
- » How well did the cable solution technically exceed the standards?

A short list of the top 3 connectivity manufacturers (Leviton, Panduit and Systimax) were invited to submit bids for the project. Ultimately, the NextLAN solution triumphed, taking first-place in a value statement.

It was no surprise that NextLAN performed above industry specifications during the simulation. NextLAN products are independently tested by Underwriters Laboratories (UL) quarterly to verify that all products on the market meet published specifications.

As with all NextLAN products installed and documented by certified Superior Essex contractors, the NextLAN CAT 6+ structured cabling system was eligible for a lifetime warranty. This unique value-added service removed the worry over long-term system performance and ensured that the products supported current and future applications.

THE SOLUTION

The district capitalized on the \$17.3 million technology component within the local school bond by using a portion of the proceeds to create a state-of-the-art LAN and WAN, both of which are expected to be upgraded to 10 GB transmission speeds within 5 years.

Superior Essex partnered with Rexel, which played a significant roll in the logistics demanded by a job of this scope. The local Rexel branch in Pueblo was able to provide hands on assistance and ready expertise throughout the duration of this project.

Based on CATV and voice/data infrastructure design concepts created by Swanson Rink, an engineering design and consulting services firm, the existing inadequate cabling system in every building was replaced with a new copper LAN. The structured copper cabling system was built with NextLAN CAT 6+, which consisted of 2.5 million feet of DataGain cable and more than 16,000 eXtreme 6 jacks, face plates, 110 blocks, 4 and 6 position surface mount boxes, and blank inserts. By selecting DataGain, the district received an exceptional performance cable that exceeds TIA/EIA CAT 6 specifications.

The new copper infrastructure has created a platform for the district to enhance its data network for e-mails, library databases, centralized files, networked printers, electronic bulletin boards, digital cable TV network. It also allows for wireless connections to be installed in media centers, cafeterias and other locations around the campuses so laptops may be used virtually anywhere on campus. In addition to carrying the typical data requirements, the investment was maximized by using NextLAN to deploy power VoIP (Voice over Internet Protocol) telephone service. Pulling the entire network together, 95 telecommunications closets connect the horizontal and backbone structure via high-performance fiber optimized cables.

With the LAN needs addressed, nearly 237,600 feet (45 miles) of fiber optics cable was laid throughout Pueblo to create a new WAN. Unite, a Missouri-based communications provider, connected all the school-owned buildings to the new 4,000 square-foot data center. (Previously, the data center was housed in the basement of the central administration building.)

Swanson Rink's WAN design called for an aerial based distribution system, which consisted of Opt-X® SC connectors, fiber optic patches, patch panels and patch cords and single mode fiber optic cable for the backbone. The loose tube fiber optic cabling with the new water-blocking PFM (Polymer Filling Matrix) gel from Superior Essex was perfectly suited for the project because its non-sticky properties allow for easier and faster clean up and installation.

Like with the structured cabling system, the district didn't have to worry about the performance of copper voice and fiber optic OSP cables. As part of the unique Superior Essex Campus Warranty program, when 100 percent of Superior Essex cabling is used for the structured cabling portion of the network, all grades of additional premises copper communications cables and all grades of Outside Plant copper and fiber communications cables installed within the same campus are covered by a 20-year extended manufacturer warranty.

THE RESULTS

In addition to creating an all-new campus-wide structured cabling system, the district has significantly enhanced its technology efforts by upgrading its technology program. The upgrades include: replacing about a quarter of the 4,000 PCs on the network; and creating mobile computer labs for the high schools and some middle schools. It also means that the district is able to completely automate and run building controls (HVAC and electrical) on the new network.

With the foresight to install a robust infrastructure, the district has mapped out plans to offer students a broader array of classes without dramatically increasing costs. One such plan includes offering classes to Pueblo students via distance learning programs at University of Southern Colorado. The university-school alliance represents an attempt to enhance the educational opportunities of District 60 and construct a seamless school-college educational system. There's also sufficient bandwidth to allow teachers to conduct classes on one campus while students attend and actively participate without leaving their home schools.

Even with the added traffic and existing expansion plans, District 60 will use only a small portion of the new bandwidth. With NextLAN, the district's new powerful infrastructure will continue to offer high-performance voice and data traffic speed, and is covered by a warranty program that offers peace of mind.

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HIGH PERFORMANCE CABLING SYSTEMS



Superior Essex is one of the largest manufacturers of communications cable products in the world, and a market leader in datacom copper and optical fiber cables. With more than 50 years of experience in telecommunications cable design and production, Superior Essex Communications has built a reputation for delivering products that lead the market in terms of technology and quality. From Outside Plant (OSP) to in-building LANs, Superior Essex cables carry the voice and data traffic for the largest telecommunications service providers in the world as well as many of the leading enterprises throughout North America. Visit SuperiorEssex.com/Comm to learn more.

Superior Essex Communications LP

6120 Powers Ferry Road, Suite 150
Atlanta, GA 30339
800.551.8948
SuperiorEssex.com/Comm



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Leviton Network Solutions

2222 222nd Street SE
Bothell, WA 98021-4416
800.722.2082
Leviton.com



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