LOWERING COSTS, EMPOWERING TEACHERS AND ENABLING STUDENTS TO LEARN FROM ANY PLACE AT ANY TIME

Case Study
Carroll County Public Schools (CCPS)

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This Maryland county has implemented its own fiber broadband network to serve 47 school buildings as well as local government offices, libraries and the community college. In a strategy that greatly increased support for the infrastructure CCPS needed for 21st-century learning, the school system's IT department broadened its vision beyond the needs of K-12. The results include lower costs, accelerated ROI, more productive teachers — and a wealth of evidence proving that collaboration works.

Challenges

In 2004, the Carroll County Public Schools found itself at a technology crossroads. The existing wide area network (WAN), made up of leased circuits, was strained to capacity by everyday user demand for services, including basic Internet access. Downloads were slow and frustration levels high. To improve service, Carroll County Public Schools was moving to a web application development environment where custom applications were developed in-house. This vision could not be successfully realized within the framework of very limited bandwidth. As new applications were added, network performance declined even more drastically.

The school system's CIO, Gary Davis, realized that adding more leased circuits would only make the network more costly, without really solving the performance and reliability issues, or enabling the value-added education applications so necessary in the 21st-century classroom.

"My goal from the beginning was to make our IT department more service-oriented," Gary Davis recalls. "I wanted it to serve the needs of our teachers, students and parents. And the biggest roadblock going forward was the limitations of the wide area network. Continuing down that path was just cost-prohibitive."

"In looking for a simple illustration to compare the new 10-gigabit network to the old T-1 connections, Gary Davis came up with an illustration that people understand quickly. "The 10-gig pipe is like a 28-foot storm sewer, and the T-1 is like a narrow drinking straw."

— Gary Davis, CIO, Carroll County Public Schools

Solution

Just as the Carroll County Public Schools was encountering these networking challenges, Nortel came to them with a novel offer — a complete audit of the existing network infrastructure. The audit would be performed free of charge, with no obligation to CCPS, and would include recommendations going forward.

Immediately seeing value in Nortel's expertise, Gary Davis took the audit request to school administration and received approval.

"Looking back," he says, "the audit was the most important thing I ever did in my position as CIO. It kicked off the realization of our vision of technology in the school system. This is what got us moving. It gave us a blueprint not only of where we were, but of where we wanted to go in the future."

The Carroll County Public Network is born

The Nortel audit and proposal included an innovative concept that turned out to be the essential key to CCPS getting the infrastructure funding it needed. That key was the concept of a community network, one that would serve the needs of the public library, Carroll Community College and the county government, in addition to the school system. Government leaders immediately grasped that the initiative — now called the Carroll County Public Network (CCPN) — could also become an engine of economic development for their community.

The CCPN is governed by a formal Memorandum of Understanding (MOU) with the four partner organizations' IT departments and Gary Davis has been the Chairperson since its inception. "The cooperative effort has been a huge positive," Gary Davis says. "By partnering with other public entities, we are all benefiting from the economies of scale. It's good government and gives our taxpayers more bang for their buck. And I have to say that Nortel already had this vision of the community network, and we were able to use it."

A phased services rollout and transition to an all-IP network

The proposal gained funding approval in 2007, and the build-out began in 2008. As designed and funded, the network will connect 93 public buildings over 110 miles of fiber-optic cable. The plan leverages as many existing CCPS facilities and legacy investments as possible, down to the level of still using hundreds of Nortel telephone handsets already in the schools. The plan includes a broadband optical network based on the Nortel Ethernet Routing solution which allows for plenty of room for growth. To reduce costs, including leased circuit and toll costs, the decision was made to evolve toward Voice over IP, based on a central Nortel Communication Server 1000 and Business Communications Manager (BCM) platform replacing older key systems in the individual schools. The services being implemented include distance learning, unified communications, videoconferencing, IP security cameras and a card-swipe entry system — and those are only the beginning.

Bandwidth enables services, pleases more stakeholders

"In the past I often had to tell people, 'We can't do this or do that', because we didn't have the bandwidth. Now, it's like night and day," Davis says. "The floodgates have opened, and every time we connect up another school, people immediately understand the power of what they can do with more bandwidth. They feel empowered to do more."

Benefits

Lower Total Cost of Ownership

The new network, which enables new applications for schools, is also more secure, reliable and energy efficient, and saves money both in the near term and for the life of the network. For example, simply by moving to VoIP, the school system's cost savings for telephone service, including toll costs, are expected to be substantial.

But CIO Gary Davis cautions against calculating ROI based only on services offered in the previous mode of operation. "You have to factor in the opportunity costs of things we couldn't do previously, or the time that was wasted. Now our teachers have that time available and it makes them more productive. I would say this network pays for itself already, and we are just scratching the surface of what it will be able to do."

Enables students to learn from any place at any time

CCPS is already reaping the benefits of distance learning and e-learning in dramatic fashion. Learning experiences that once required transportation expenses can now be brought right into the classroom. High school advanced placement courses were previously limited to schools with a high enough sign-up rate. Now, even if only one student in a school wants to take a particular course, the network will be able to deliver the instruction from any location. By the same means, high school students will be able to take classes at the community college.

Teachers who are more productive, with fewer frustrations

The Internet connection was so slow that one teacher had to start a design application at lunchtime to make sure it was ready for her afternoon class. Now, the program loads within seconds. Previously, it may have taken a teacher hours over the course of the day to do the report cards for one class, and now it can be done in an hour. In addition to freeing up more time for actual instruction, the network has also facilitated professional development for teachers. They now have access to continuing education credits via distance learning from various providers (including the community college in the future).

Enhanced safety and security

"Another benefit the network has given us is a standardized security solution in all of our schools," says Gary Davis. "With IP cameras in any location, our maintenance and security personnel can log in, even from home, and get a live shot in real time." The plan also calls for integration of fire alarms, surveillance and a card-swipe system is being implemented. "We'll have the ability to do a school-wide lockdown from a single control point," Davis adds.

As more of the wireless component of the Carroll County Public Network is rolled out, local police — and therefore public safety — will benefit from standardization and easier access. Law enforcement will no longer need to monitor separate, incompatible systems for the schools, library and community college.

More effective, efficient communications overall

Nortel is a recognized leader in Unified Communications (UC), which will enable contact between the teachers, administrators, parents and students — improving overall school operations and staff satisfaction. CCPS will have the capability to

Why Nortel?

"The relationship with Nortel was key to everything we did going forward. They have a deep understanding of our requirements. Whenever we have an issue, we know we can call someone who understands and will resolve it. I had a high level of trust in them, and knew that they were trying to help me achieve a goal."

— Gary Davis, CIO, Carroll County Public Schools

implement a UC solution in which voicemail, email and even instant messaging (IM) will be integrated across the network.

Ability to tap federal funding, and possibly save teachers' jobs

"As far as eligibility for stimulus funding, we are definitely 'shovel ready' to expand our network," says Gary Davis. "We have a proven track record with what we've done so far, and are in a great position because our network has already been designed and engineered."

Conclusion

Nortel provides the consultation, advanced wired and wireless technologies, and ongoing services to partner with you in creating the right solutions for the evolution of your network. We have solid expertise in the education field, and a proven track record with elementary and secondary schools, colleges and universities, and a wide range of public sector agencies. For more information, contact your Nortel representative

Nortel solutions:

- Ethernet Routing Switches
- Communication Server 1000
- Business Communications Manager

NN124114-052009

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