FOUNDATION FOR THE FUTURE

West Islip Public Schools' network and connectivity upgrade offers benefits in the classroom and beyond.

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Despite current struggles with shrinking enrollment and a tax cap that limits funding, West Islip Public Schools (WIPS) is making technology investments that will support educational innovation and improved communication in the district for years to come. After completing a server virtualization project in January, WIPS has moved on to a network infrastructure upgrade that will include expanded and improved wireless coverage and a move to IP telephony, according to Network Administrator Amit Pathak.

"The district has been running on a very lean infrastructure for many years," says Pathak, who has worked as a technology consultant for the Long Island, New York school system for a decade. "Now it's time to ensure our infrastructure is ready for the foreseeable future. A lot of our users need better, faster connectivity."

WIPS serves more than 5,000 students in the town of West Islip on the south central shore of Long Island N.Y. The district is made up of six elementary and two middle schools, along with West Islip High School. More than 2,000 computers for student use are spread among computer labs and libraries at all grade levels, says Pathak. Each WIPS classroom also has a computer for the teacher's use. In addition to the labs, classrooms in the elementary schools are equipped with four or five terminals for students. Wireless access is also currently available in the libraries of all the schools. Besides purely educational applications, the IT infrastructure also supports financial, administrative and course management operations.

Improved and expanded network connectivity became increasingly urgent as WIPS teachers and administrators began making more use of Internet applications and taking advantage of web-based teaching and learning tools, Pathak says. "The baseline infrastructure should be very stable to support all our devices and all the things teachers want to do with them."

Network infrastructure provides both the foundation for most of the IT tools being adopted in schools and the glue that connects resources so that they work together effectively, says Zeus Kerravala, principal analyst at ZK Research. "Upgrading the network is important both to improve performance today and to pave the way for applications and resources to come," he says.

The infrastructure upgrades will allow West Islip schools to take advantage of the "great advances" in educational technology made in recent years and thereby maintain and extend educational excellence in the district, says WIPS Superintendent Richard Simon.

"We want to give our teachers

the best tools possible, and for those tools to work well we needed the upgrade," he says. "The tools have great potential to engage students and engage staff. It didn't make sense to invest in the tools without providing the supporting technology and training."

Fast Start

The first step of the network upgrade was purchasing fiber optic connections from each of WIPS's schools back to the data center at the district offices, the fiber replacing outdated T1 lines that were "completely unacceptable now," says Pathak. After the fiber connections were completed in February, the IT staff started working on the wiring closets in each of the schools and the central office, installing more than 100 new Cisco Gigabit Ethernet switches throughout the district to take the place of older, 100Mb switches from a variety of vendors. Included in the installation were Cisco Catalyst 3750 switches for the data center in the central offices, about half of which were configured to provide Power over Ethernet (PoE), which will deliver power to wireless access points (APs) and IP phones. The deployment in the school buildings used Catalyst 2960 switches, also with about half being PoE enabled.

All the district's applications and data from student management, financial, library and other systems are located in the central data center, so the faster, more stable connection from the central office to school buildings has translated into much improved access for users, says Pathak.

"This technology is transparent to users, but it's a whole new experience for them. Everything is faster and there's no downtime," he says. "It's better for the administrators because they can do their work more efficiently, and it's better for the students because they're getting faster Internet and a much better experience with technology in general."

It's the students' experience that most concerns WIPS Director of Instructional Technology Sue Huscilowitc, who says the upgrade was "long overdue." The revamped networking infrastructure is already paying off by enabling an interactive whiteboard installation in classrooms across the district. With the improved network, WIPS will also be able to make more use of high-bandwidth applications such as streaming video and web conferencing via Skype, she says.

"We're already seeing benefits in the classroom, and we expect to see many more," Huscilowitc says. "We're a school system and that's where you want to see change — improvements in the education we can offer our students."

Kerravala points out that inconsistencies in the network can become much more than inconveniences — they can disadvantage some students and undermine learning. "It becomes a matter of fairness as well as keeping up with technology tools," he says.

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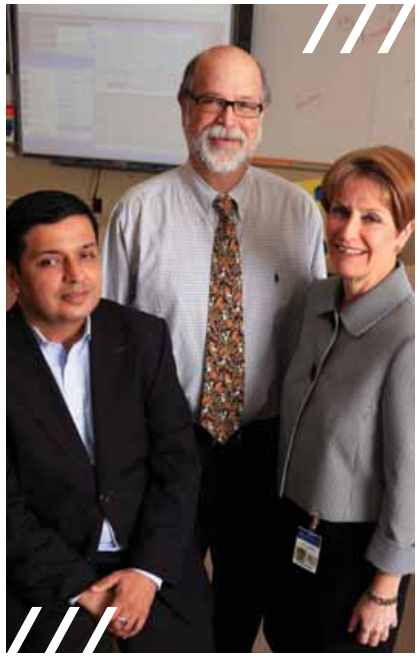

Network Administrator Amit Pathak with Superintendent of Schools Rick Simon and Assistant Superintendent Burnadette Burns

Next Steps

The next phase of the project is the installation of Cisco wireless APs throughout the high school this spring. Cisco Unified Wireless Controllers, which will be used to configure, monitor and manage the wireless network, were installed during the first stage of the upgrade. School libraries throughout the district, including those in the high school, currently have 802.11g wireless coverage. The new high school wireless network will run on the 802.11n protocol, which offers speeds 10 times faster and twice the range of the earlier version. The district plans to push wireless-N coverage out to the middle schools and then to the elementary schools, with the timetable for the expansion not yet set.

The wireless portion of the WIPS network upgrade will become increasingly important in the future, Kerravala says. "Wireless is becoming an absolute necessity in school settings," he says. "Districts have to focus on the need to provide enough wireless capacity to serve the growing needs of their students."

Transformation of the phone systems at WIPS will begin over the summer to minimize disruption for teachers and administrators, says Pathak. At that time, all the conventional public switched telephone network (PSTN) phones in the district will be replaced by Cisco IP phones and Cisco Unity Connection voicemail. The hub of the system will be Cisco's Unified Communications Manager. Cisco Unified IP Conference Stations in each West Islip school will enable conference calls and remote access to meetings across the district.

The converged voice and data network will significantly cut the cost of telephone service, says Pathak. "Our current phone costs can be phenomenal – we can pay as much as $1,200 for one phone when you add up all the wiring and service costs," he says. "The telephone portion of the upgrade will mean big savings. We will just buy the phones and plug them into any network jack."

Selection, Support and Implementation

Choosing the right equipment and services, and getting them for the best price, are particularly important in a project as big as WIPS's connectivity and network upgrade, which will cost more than $500,000. Pathak and other IT decision-makers in the district had decided early on that they would use Cisco networking products. Confidence in the quality of equipment destined to be the IT lifeline of the district for many years to come was critical, says Pathak. CDW•G, which had worked with WIPS in the VMware installation for the district's data center virtualization, came in with the lowest bid to supply the networking hardware and software.

"Cisco has always been at the forefront of technology, the industry standard," Pathak says. "Sometimes you pay a premium, but you get what you pay for. CDW•G is always our preferred solutions provider, and they came up with the best prices."

CDW•G provided advice on specific equipment models and configurations, and acted as a liaison to Cisco. So far, the implementation has gone so smoothly that the district hasn't needed much vendor or manufacturer help, says Pathak. Still, CDW•G has made specialists available to West Islip PS whenever the district needs information or technical support.

"In my 20 years of experience in the IT industry, I have learned that if you plan well, there are few surprises and implementations go well," he says. "We made sure we had everything before we began. From there, it was pretty standard. And Cisco products work great when implemented correctly."

Lessons Learned

Pathak cautions that many school districts make the mistake of putting off infrastructure improvements and ambitious projects because they appear too big and costly, especially in light of the tight budgets and small IT staffs that are the norm in K–12 education. The key to taking on these initiatives is a step-by-step approach that starts with careful planning and buying the right products and services.

"Plan your upgrade strategy up front, and don't take on more than you need to at one time. You should always be asking the question, is this good for six, eight or 10 years?" he says. "Make sure that your infrastructure – connectivity, wiring closets, switches – are configured properly and installed with the thought in mind that you'll be adding on. Our PoE switches are already in place, for example, so we won't have to do any swapping down the road. From here I'm just building unified telephony, my messaging and my wireless and just plugging it into the infrastructure."

Details are important when an organization is making improvements now and laying the groundwork for the future, says Kerravala. He also points to WIPS's installation of PoE-enabled switches as an example of a decision that will yield dividends down the road.

"You're going to see more and more things powered by PoE, things from tools like desktop video cameras to environmental systems that will allow schools to make smarter decisions about power," he says. "It's a great base technology to have in place, especially for schools, which tend to leave technologies in place for a long time and need to choose the ones they use carefully."

Kerravala adds that the IT projects that most often fail, especially with unified communications technologies, are those when organizations try to do too much at once and overload their budgets, staffs and even the users, who don't have time to understand and exploit the potential of new tools. Another key to the success of incremental deployments is putting scalable centralized management technologies, such as the Cisco Wireless Controllers at WIPS in place, he says.

Looking Ahead

The foundations laid by the network infrastructure will be a platform for essential improvements in the WIPS technology environment, says Huscilowitc. This school year's interactive whiteboard installation is only the beginning of what she envisions as a steep increase in the district's use of digital content and the tools that deliver the content. One aim of an ongoing re-evaluation of teaching and learning processes at WIPS is to see how they might be enhanced by technology, she says. WIPS is also exploring the educational possibilities of devices such as tablet computers.

"For students, technology is a given. If we want to hold their interest and teach them skills they need, we need to be on the cutting edge," she adds. "Unfortunately, the frustrations for us are financial. Technology is moving faster than we can pay for it."

The district is already exploring the value of a bring-your-own-device (BYOD) program for students. The expanded and improved wireless network will bring that discussion into sharper focus, says Huscilowitc. BYOD offers the possibility of lowering the cost of student computing. "It just makes sense for us to find some way so each kid can have a piece of technology to use at school."

Pathak sees BYOD as almost inevitable for schools that serve technology-steeped students. "We're not fighting BYOD," he says. "We're making sure infrastructure controls and security are in place. BYOD can be one more way to take advantage of the infrastructure we're building."

And there are likely many more ways to come, says Simon. "We're really at the beginning of a fundamental change in how education is delivered," he says. "We've only seen the tip of the iceberg of what we're going to be able to do with technology in the next five to 10 years." ■

NEW POSSIBILITIES

An upgraded network paves the way for future prospects.

The revamped network infrastructure at West Islip Public Schools will present an array of new possibilities for students, teachers, parents and administrators to gather information and communicate with each other, says ZK Research analyst Zeus Kerravala. Early evidence of the transformation comes in the form of VoIP telephony, the first step toward a unified communications strategy, but other potential benefits include:

- **One-to-one computing.** The cost can be a steep barrier, but a bring-your-own-device (BYOD) program can help; and expanded wireless coverage, a key component, will be in place.
- **Increased Collaboration.** Increased speed and bandwidth could enable web-based audio and video conferencing to support collaboration among faculty and even create a closer relationship with parents.
- **Increased use of digital content and online teaching tools.** More capacity in both the wired and wireless networks means the district will be able to take advantage of high-bandwidth applications and resources.

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