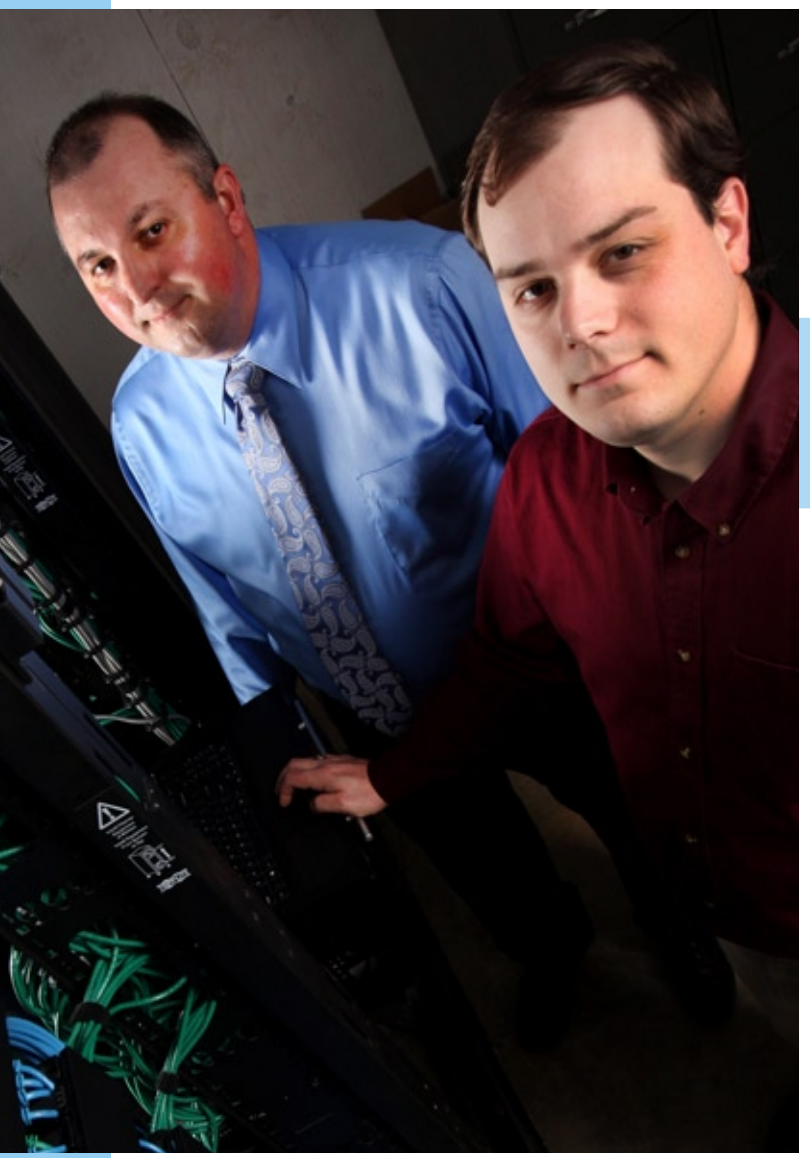
NETWORKING INFRASTRUCTURE:

BEFORE AND AFTER



Stephen Johnson, IT Director; Matt Colburn, Network Administrator; Hardin County Schools, Savannah, Tenn.

A MAJOR NETWORK OVERHAUL TRANSFORMS HARDIN COUNTY SCHOOLS, PROVIDING MORE RELIABILITY, LESS COMPLEXITY AND STRONGER SECURITY.

Matt Colburn spent three and a half years managing the network at Hardin County Schools, though "managing" is a generous word. "We had pretty much been in maintenance mode: Wait until something dies and then fix it," explains Colburn, network administrator at the Savannah, Tenn., district. "I wanted to get out from under that."

Colburn dreamed of a reliable, up-to-date network with centrally coordinated wireless access. That dream came true. In early 2008, the Hardin County Board of Education decided to close five of the district's 10 schools and spend $36 million on two brand-new 550-student schools — with brand-new networks. If that weren't enough, they got the go-ahead for network overhauls at the five remaining schools. "I was told that we needed to figure out what it was going to cost," Colburn recalls.

One problem: He had no idea. He had replaced sections of networks before — a closet here or there — but he had never built a school network from scratch, much less an entire district network.

Colburn called his CDW·G account manager, Phil Oberholtzer, for advice, and along with CDW·G network specialist Patrick Kennedy, they sat down and mapped out a new infrastructure. "We collaborated quite a bit on the network plan," says Colburn. "I knew what we wanted to do, and they knew what we needed to make that happen, so we designed the system together."

Fast forward three years. Colburn is now managing a new HP ProCurve network. It's reliable, up to date and has centrally coordinated wireless access, power protection and strong security. Not all districts have the opportunity to undertake such a comprehensive overhaul, but as mobile devices grow in popularity and digital educational resources change the shape of classroom instruction, most districts find themselves in need of some sort of network refresh.

"Networks are growing in size and complexity," says Laura DiDio, principal analyst at research firm ITIC. So when revamping a network, it's important not only to look at current needs but to anticipate what's on the horizon. "You have to be careful, because you'll need to live with that network for years to come."

With Hardin County Schools' new network in place, Colburn and IT Director Stephen Johnson are already at work introducing technologies, such as Power over Ethernet (PoE), that the district never could have supported with its legacy infrastructure. They're planning to finish installing Voice over IP (VoIP) phones throughout the district this summer.

The new network also has far more bandwidth. The district went from 10 megabits per second to a gigabit in some closets. "We're able to push more traffic across our network," says Colburn. This has enabled teachers to take on video-streaming projects that bring the curriculum to life for their students. "On our old networks, they'd have had a lot of problems getting them to work properly."

Johnson, who spends a great deal of time working with teachers and principals in the schools, is witnessing firsthand the benefits of the new network. Before the renovation, the schools had spotty wireless access — cheap access points were individually connected to the network. Staff members like Johnson who travel from school to school couldn't always connect because the schools, even different areas within a building, had different SSIDs. "It wasn't very reliable either," Colburn says of the wireless access.

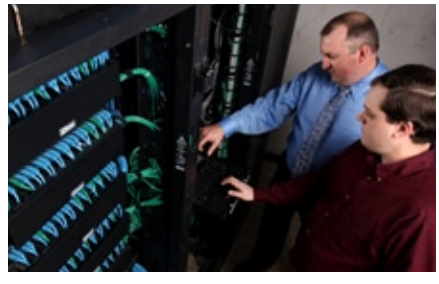
But now, with the new wireless network in place, Johnson can travel from school to school and log on very easily. "I can take my notebook into the high school and walk from one end of it to the other end and not lose connection," he says. It even works in the parking lots.

The best part of the new network is what's yet to come. The system will enable the district to adopt new technologies well into the future. That foresight, says DiDio, is critical when planning network projects. Her advice is to make a three- to five-year plan that looks at demographics: For example, will the school be shrinking, growing or staying the same? What educational initiatives are on the horizon? Then, she adds, "Buy the beefiest configuration that your budget will allow."

GETTING THERE

From planning to opening day, it took about three years to build the new schools, with construction taking up about half of the project timeline. The county broke ground in January 2009, and the building opened its doors last August. "Everything just kind of fell into place," says Colburn. "We ran into our share of problems, but nothing that we couldn't get resolved fairly quickly."

The first road bump was a biggie. After mapping out a top-of-the-line system that delivered everything they wanted, Johnson and Colburn got word from the school board that the approved budget was far lower than expected. Colburn, disheartened, called Oberholtzer and Kennedy to deliver the news, but they offered an alternative: HP's ProCurve ZL series. It's a modular



system with a chassis and standardized modules and switches. So if a module goes out, they could simply pop it out and replace it so that the entire network doesn't go down. They specced it out with the same features as the first system, and it came to roughly half the cost. "It was a drastic difference," Colburn says.

Another problem arose when they were unpacking the switches. They needed a 220-volt power cable, but the ProCurve chassis shipped standard with a 120-volt cable. Colburn called CDW·G, and, he says, "I had the right cables in my hands three or four days later. We were prepared well enough that we didn't get behind because of those delays."

The county's old network consisted largely of outdated 3Com components, but there was a hodgepodge of random hardware mixed in. Through the years, as switches died, IT would replace them with whatever could be afforded at the

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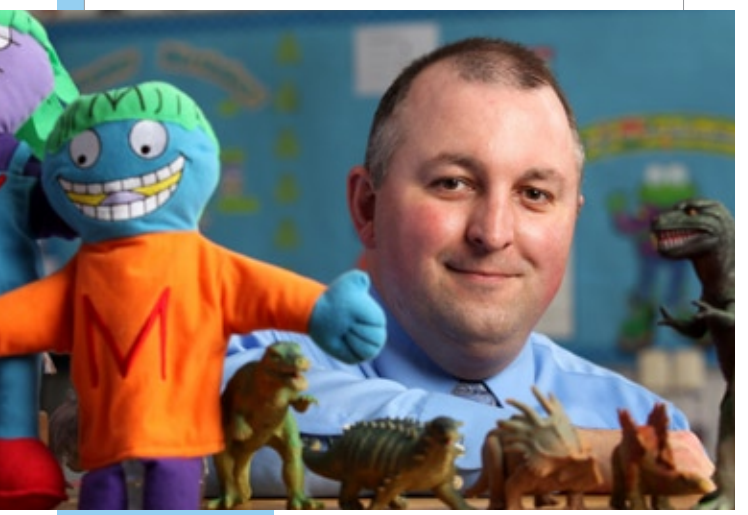
Network Overhaul Checklist

Thinking of renovating your network? Laura DiDio, principal analyst at ITIC, offers some tips for a successful transition.

- **Do a total review of your existing network**
  What works well? Where are the bottlenecks? Do you have enough bandwidth? What versions of hardware and software are you running?
- **Think "security, security, security"**
  Not only do you need to pay attention to antivirus software, authentication, tracking and malware detection, but you need strong policies and procedures in place, and you need to enforce them. Schools have a particular challenge because students can be very sophisticated when it comes to technology, and they'll often attempt to gain access to resources they're not supposed to see.
- **Think about virtualization and cloud computing**
  If your district is short on space or staff expertise, virtualization and/or cloud computing might be right for you.
- **Don't be afraid to ask for extras**
  Free training, support, educational discounts, even free hardware or software if there are beta-testing opportunities available. You can also ask for a cap on licensing price hikes.
- **Plan for as much storage as possible**
  Storage needs can double or triple year to year, depending on new technologies.



time. "We would just put it in, plug it in and hope it worked," Colburn says of the components added to the network over the years. "Jumble is a good word for it."

In addition to standardizing and modernizing the infrastructure, Colburn wanted a system with strong security features. The old wireless access points in the schools didn't have any security. The district network was locked down, but anyone could get wireless access in the schools. Now only authorized user accounts with passwords can connect. "We've moved to a much more secure network," says Colburn. Eventually, he plans on creating a guest account so visitors can get onto the Internet wirelessly without having access to the district network.

In terms of power protection, Rob Pepper, CDW·G power and cooling specialist, helped design a system that would protect the district's most critical system: voice communication. Along with the HP ProCurve gear, they rolled out Tripp Lite battery backups in all the network closets. "They're excellent systems," says Colburn. "We're really happy with them."

Each closet has a set amount of battery runtime, depending on how mission-critical it is. At the two new schools, for instance, all the IP phones run to one switch, which has six to eight hours of battery backup time and is also plugged into a generator. "In theory, we'd never lose power on that switch," says Colburn.

All told, the system offers everything Colburn and Johnson wanted. "Aside from a few minor hitches, most everything came through just as it was supposed to," says Colburn. "I wish I could take credit for all of it."

In addition to CDW·G's help designing the network, he says the project's success is due in large part to Automated Systems Consulting (ASC), a Tampa firm that CDW·G recommended to install and configure the network. "As soon as we had blueprints back from the architect, we set to work," says Colburn. "And we pretty much worked solid until groundbreaking."

While the district was breaking ground and doing the brick-and-mortar construction on the two new schools, IT set to work replacing the aging infrastructure at the five existing schools. Since they were still in session and had network traffic, ASC suggested putting in the new network alongside the old one so they could fine-tune it without worrying about service interruptions. "Our users," says Colburn, "really never saw much of the transition."

> **The best part of the new network is what's yet to come.** The system will enable the district to adopt new technologies well into the future.

DESTINATION EDUCATION

One student at East Hardin Elementary has never set foot outside of county limits, not even to Memphis or Nashville. Another has taken family vacations to the beach, the mountains, Disney World and more. So when those two children read a story about, say Disney World, they have completely different experiences. For one, a rush of memories brings the story to life, while the other has no personal connection to the tale.

Regina Franks, curriculum and instructional facilitator at East Hardin, one of the two new elementary schools, has long wanted to bridge that gap between students. She's been looking into educational streaming media for years, but with the old network, it was never a possibility. Now, thanks to the added bandwidth on the new network, she's been showing the teachers in the school how to use Learn360, a subscription media-on-demand service that lets teachers develop digital lesson plans and tap online resources.

Third grade teacher Nell Mattingly has been using it to take her social studies students on virtual field trips to Monticello and Mount Vernon. "She's taking these kids places that some of them will never have the opportunity to travel to," says Franks.

The district, adds Johnson, is in a high-poverty area. "This provides an avenue to show them the world without having to buy the plane ticket."

Plus, integrating technology into the curriculum is no longer just a luxury, says Franks. "We have students in kindergarten or first grade who are going to be taking jobs that haven't even been invented," she says. "The more we can expose them to technology, the more they'll be prepared to work with technology."

It's not just students and teachers who can go places thanks to the network. The IT department gave wireless VoIP phones to the principals of the two new schools, and they ultimately plan to get at least one for each of the county schools.

"It's made my job a whole lot easier. I'm not tied to a desk," says East Hardin Principal Todd Buczynski. A standard mobile phone wouldn't get reception in the building because it's tornado-proof: built to withstand 250 mile-per-hour winds. But with his Avaya wireless phone, Buczynski can communicate with anyone in the school, make announcements and take calls from anywhere on campus.

The teachers also have Avaya phones in the classrooms, which has helped build a close-knit environment at East Hardin. Even though four smaller schools were folded into one much larger building, the improved communications system has maintained the small-school feel of the old buildings, says Buczynski.

But the staff is just starting to learn all the benefits and features available with the new network. "I have to say that this year has been the most exciting for me," says Franks. "There's so much out there, which can be kind of intimidating because you don't know where to start. But that's a good problem to have." ■