



IP TELEPHONY AND UNIFIED COMMUNICATIONS HELP SCHOOL SYSTEM DRAMATICALLY CUT COSTS AND EXPAND DIGITAL EDUCATIONAL ENVIRONMENT



Alcatel-Lucent's OmniPCX Enterprise system lowers telephone expenses for a U.S. school system while improving homebound student instruction with the use of My Teamwork



When Gwinnett County Public Schools, located in the southeastern U.S., sought to upgrade from its old analog phone system, it turned to Alcatel-Lucent and the firm's regional Business Partner to design and install a sophisticated IP networking solution that not only lowered telephone costs by, in some cases, 60 percent, but also opened new opportunities to motivate and instruct homebound students using My Teamwork interactive conferencing and collaboration software.



GROWING SCHOOLS NEED EXPANDED COMMUNICATIONS

Located 30 miles northeast of Atlanta, one of America’s largest cities, Gwinnett County boasts an attractive suburban setting with all the benefits of big-city life. This fast-growing area is home to Gwinnett County Public Schools (GCPS), where more than 157,000 students attend 114 schools from kindergarten through high school, making it the state of Georgia’s largest public school system. The GCPS student population steadily grows each year by about 3,500. With nearly 22,000 people, GCPS is Gwinnett county’s largest employer.

Students and teachers are the heaviest users of digital technology for instructional purposes. For example, nearly all teachers possess laptop computers, and all have a desktop PC in their classroom. Staff and students also have remote access to the system’s main server through a secure portal to monitor school e-mail, test results, homework as well as protected financial, academic and administrative information for teachers and administrators.

A major frustration, though, was the original, decades old analog telephone system owned by the area telecom provider and leased to the entire district. “As digital-based education exploded in the late 1990s, our old technology simply didn’t have the capacity and bandwidth to keep up with demand,” says Rick Overton, Director of Telecommunications & Network Services for the district’s Information Management Division. “And a wide area network (WAN) for data installed nearly 10 years ago was capacity-based instead of connectivity-based, and could not efficiently tag data packets end-to-end. This was a limitation that at times compromised service quality.”

As a result, emerging communications technologies such as video, voice-over-IP (VoIP) telephony, centralized server management and storage were difficult or impossible to reliably implement, according to Overton.

OMNIPCX ENTERPRISE THE MOST TECHNICALLY SOUND

GCPS began its direct relationship with Alcatel-Lucent in 1999 when conversion to digital switching was started in all middle schools, and some elementary schools. Then in 2001, another provider’s digital time division multiplexing (TDM) system was installed to support the school system’s data center and help desk.

“We were, however, eager to move away from the legacy analog and TDM platforms to embrace VoIP, and sought new IP-based technology,” says Overton. At that time, the Alcatel-Lucent **OmniPCX™** Enterprise had not yet been introduced in America. But the data center’s network support went to Alcatel-Lucent’s

CHALLENGES

- Legacy analog system can’t support digital technology
- Overall communications slow; poor QoS
- Cost concerns with aging analog system
- Teachers/students cannot collaborate effectively
- Schools must keep pace with tech-savvy students
- No effective solution to meet the needs of homebound students

SOLUTIONS

- Alcatel-Lucent **OmniPCX** Enterprise
- Alcatel-Lucent Omni Digital Switches
- Alcatel-Lucent My Teamwork conferencing & collaboration

BENEFITS

- New system embraces digital age
- Major reduction in telephony charges
- My Teamwork dramatically improves home education
- VoIP network easily expands to all 114 schools



various digital switches because of their reliability and flexibility to handle various products from diverse suppliers

In early 2002, a six-person GCPS technical committee developed and issued guidelines for IP packet switching that resulted in a formal contract solicitation. The committee included the Director of Telecommunications Services, WAN Enterprise Manager and Technician, the district's Executive Director of R&D, and two contracted Senior Network Architects.

Five firms submitted proposals, and the Alcatel-Lucent switching platform was the committee's near-unanimous choice. Of the many reasons for their selection, the committee cited the flexibility of Alcatel-Lucent's switching solution (analog, TDM and IP compatible), which is standards-based with no proprietary controls. In 2004, Alcatel-Lucent's Business Partner in the region, Morse Communications, replaced the existing voice switch in a pilot offering to accommodate all platforms – legacy, TDM and eventually, VoIP. Says Overton, "GCPS leadership was very pleased with the system."

So when GCPS was prepared to invest in a new, system-wide VoIP platform, there was already good mutual respect and a solid working history with Alcatel-Lucent and Morse Communications. "Alcatel-Lucent's future technology roadmap was very realistic, supporting data, voice, video and wireless, which would help support our strategic direction for years to come. Best of all was the value offered for the price.

The new infrastructure based on the Alcatel-Lucent **OmniPCX** Enterprise consists of Alcatel-Lucent's **OmniSwitch™** 9700 at the core (one per school) and **OmniSwitch** 6850L's on the ends.

"The My Teamwork solution has made a remarkable difference in the quality of homebound education."

Rick Overton,
Director of Telecommunications & Network Services,
Information Management Division,
Gwinnett County Public Schools

Other switches used include 6600 and 9800 series at the data center core. Virtual local area networks (VLANs) are used to separate voice, video and data traffic.

The system supplies 100 MB speeds to desktop PCs, and 1 GB backbones to core. It also offers a 100 MB WAN Ethernet to schools, and multiple GB links to the data center to support the voice, video, and data infrastructure. Seventy-five percent of voice traffic is assigned to TDM, and 25% to VoIP. Copper trunk cabling (25 pair) allows for TDM flexibility. There is a mix of distributed and centralized servers.

IMPRESSIVE COST SAVINGS

The new system has produced dramatic cost savings versus the legacy analog system, according to Overton. "Overall, monthly telephone charges per school have decreased dramatically, up to 60 percent in some cases." For example, one high school whose annual phone expense totaled \$16,154.00 (USD) using the centralized analog system has a projected telephone budget of \$7,343.00 with Alcatel-Lucent **OmniPCX** VoIP. An elementary



school's current annual telephone budget of \$4,693.00 is projected to drop to \$749.00 (excluding primary rate interface charges) by 2009 despite running off the TDM platform versus VoIP.

These savings are achieved even though more telephone sets have been added throughout the network, along with other digital-based offerings supported by the **OmniPCX** system.

MY TEAMWORK IMPROVES HOMEBOUND EDUCATION

One unique application involves using Alcatel-Lucent's 'My Teamwork' conferencing and collaboration solution to help homebound students keep current with studies. "Homebound education involves mostly middle and high school students who cannot come to school each day," says Overton, "typically because of a short-term illness requiring home recovery, or longer-term situations involving a debilitating injury or disability. Whatever the reason, GCPS is committed to supporting these unique cases through lessons at home."

He adds: "Years ago, special teaching staff would actually travel to each student's home to provide a few hours of daily instruction. It was very time consuming and limited to one-on-one contact. We later began using an audio bridge to conduct group lessons. But instruction was always limited by the lack of graphics and visual aids, and voice-only teaching is typically boring for young, inquisitive students."

Overton says the My Teamwork solution has made a remarkable difference in the quality of homebound education because it's both voice- and browser-based to support a wide range of multimedia via the Internet. "Teachers can use any desktop application or Web site to reinforce lesson information," says Overton. "Let's say a teacher wants to discuss steps in a science experiment. A video link via the Web graphically shows how to conduct it while the teacher explains each step. You can also link in real-time to video clips of history, interactive graphing or white-board instruction for math or science. Anything on the web, such as slide shows, spread sheets, or video can be used as an instructional tool."

There are also packaged educational programs available with self-paced study notes and demonstrations that can be accessed anytime by homebound students using My Teamwork. "This high level of interactivity is very effective in keeping pace with the technology culture students are accustomed to outside school," says Overton. "The ability to quickly switch from one visual component to another all within the same lesson keeps students interested and attentive, thereby facilitating greater retention."

In all, GCPS is very pleased with the range of benefits Alcatel-Lucent's **OmniPCX** Enterprise with My Teamwork offers. Overton shared: "When our CIO saw the projected 2009 cost comparisons between middle and high schools using the **OmniPCX** versus the legacy analog system, the savings were so impressive that he summarily instructed my department to start migrating 69 elementary schools not originally included on the **OmniPCX** platform as soon as possible."



ROLE OF BUSINESS PARTNER

Morse Communications, Inc., worked as project leader to gather requirements, customize and install the VoIP equipment, manage service cutover and train GCPS staff. The firm today provides full-time, on-site backup support for the school system as well as ongoing service, maintenance and consultation as needed.

BUSINESS PARTNER INFO

Headquartered in Melbourne, Florida, the firm provides design, installation, maintenance and consultative services over a wide range of communications projects including telephony systems, advanced software application servers, contact center solutions, on-premise wiring, access control and security, digital video security monitoring, WAN/LAN IP networking, and Category 5, 5e and 6 cabling.

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