



## ▶ The ABCs of VoIP – Emtec® helps school district make the grade with network convergence.

*When it comes to telecommunications, Hopewell Valley Regional School District in New Jersey has moved to the head of the class.*

The district recently completed a major voice and data convergence project with the help of Emtec, Inc. With Voice over IP (VoIP), the district (comprised of four elementary schools, a middle school and a high school serving Hopewell Township, Pennington Borough, and Hopewell Borough in central New Jersey) now enjoys a variety of benefits including delivering phone calls and other voice services over the data network. It eliminates the need to maintain separate voice and data networks, simplifies phone system administration, and provides numerous features that weren't available on the district's legacy private branch exchange (PBX) phone system.

*"This is the solution for the future," said John Hager, Director of Information Technology for the school district. "Our installation is one year ahead of the market curve for installing Voice over IP, but in terms of the education market it is probably five or six years ahead. We've taken the leap."*

Hopewell Valley took that leap out of necessity. Its aging PBX systems were becoming unstable and unreliable, requiring more frequent and costly maintenance.

*"We had a huge need for an up-to-date phone system — it was critical," said John Hager. "Our PBX phone system were failing in every location. The system was 20-plus years old, and it would have required a large amount of dollars to bring it up to speed to support the business requirements of today." "Instead of solving just the immediate problem, we decided to answer the dilemma with a long-term solution."*

### Easy Choices:

After researching available technologies, the school district decided to implement Cisco's Architecture for Voice, Video and Integrated Data (AVVID) running over Cisco Call Manager IP PBXs, with Cisco 7940 and 7960 IP Telephones deployed in classrooms and administrative offices. Everything is tied together with a routed Cisco-based LAN/WAN, which runs voice and data.

Choosing an integrator to take on the project was a straightforward task, according to Hager.

*"Emtec is the vendor of choice for us," he said. "I have used them for everything from wiring my network to supporting my phone system. We have purchased software licenses from Emtec, Cisco SmartNet contracts from Emtec, and we have them quote every wiring job we have. They are the people we think of first."*

In fact, Emtec had been deeply involved in a network upgrade for Hopewell Valley one year earlier, when the district replaced frame relay with ATM and swapped its standard DSL modems for Cisco's G.SHDSL interface cards.

*"We had improved all their infrastructure over the past two years, upgrading all their switches to Cisco equipment, so they came to us to help determine the best telephony solution," said Emtec Solutions Engineer Dave Pfiester. "We determined that the Cisco AVVID solution would be a perfect fit for them."*

### Backup Plan:

One of the first considerations in voice and data convergence is bandwidth. Data networks often require a major upgrade to handle the additional voice traffic. But that was not an issue for Hopewell Valley, due to the recent network upgrade. After monitoring the network for a few days, Emtec determined that the school district was only utilizing about 10 percent of its WAN capacity and about 2 percent of its LAN capacity.

*"The network was sufficient to support voice traffic without spending more money to increase bandwidth," said Pfiester. "The next step was to build redundancy into the network. That is extremely important when you begin to run voice over your data network. If somebody loses their computer for a while, it might not be a big issue. But if they lose the ability to make a phone call, it could be a life-and-death situation."*

Traditional phone systems will receive power from the PBX itself in the event of a power failure, but IP phones require an external power source. To ensure phone availability, in-line power switches and UPS solutions were placed in the wiring closets at each site in the district. This provides backup power for each of the district's Cisco switches, routers, CallManager servers and Unity voice mail servers.

As an additional safeguard, Emtec installed Cisco's Survivable Remote Site Telephony (SRST) software at each school to provide call-processing redundancy. In the unlikely event the WAN fails, the Cisco SRST solution sends calls to the public switched telephone network (PSTN) to ensure that all calls get completed.

*"One of the biggest concerns people have about IP telephony is what happens with voice if something on the data side fails," said Pfiester. "SRST acts like a mini PBX to ensure they always have at least a couple of phone lines to make outbound calls."*

### Safety First:

With the multi-layered redundancy, the VoIP solution also provides Hopewell Valley with significant safety and security benefits. The system ensures that there is always at least one phone line at each school that can be used to make a 911 call. And unlike the old PBX system, emergency calls go directly to the police station rather than being routed through the district's main switchboard.

*"From a safety perspective, it was important to ensure that emergency personnel get to the right place as quickly as possible," said Pfiester. "This system allows emergency personnel to see immediately that a call is coming from, for example, one of the elementary schools rather than the high school."*

The direct-dialing capabilities of the VoIP system also make the school district more accessible from an outside perspective.

*"It allows the community to freely contact teachers and administrators," said Hager. "Before, you could only get to the main office and then you had to be transferred. Now, each teacher and each administrator has a voice mailbox, and significant functions can be directly dialed. All of those things help make this a very robust system."*

The project was completed in April, but the beauty of the system is the flexibility for adding additional services down the line based on Hopewell Valley's needs.

*"We've just scratched the surface of what this phone system can do," said Emtec Senior Solutions Engineer, Rick Kelsten. "Many applications can be added in the future, such as a 'message of the day,' menu items or athletic schedules that can be shown on a phone's display screen. This system will grow with them."*

Hager said he couldn't be more pleased with the system and Emtec's involvement.

*"Emtec stayed with this project well beyond the originally defined scope of work," he said. "Their company President & COO (Ron Seitz) visited my site, and that proved to me Emtec's confidence and commitment to the quality of my project. They treated this as a project that was just as important to them as it was to their customer, and their efforts show in the results."*

**About Emtec:** Established in 1964, Emtec, Inc. is a systems integrator that provides IT services and products to the federal, state, local, education and commercial markets. Our market leading value-based management methods, coupled with best-in-class IT technology, consulting and development services, address a wide range of specific client needs, as well as support broader IT transformation initiatives. Emtec's service capabilities span the United States, Canada and countries around the globe.