



School District Extends PBX System with Unified Communications Solution

Overview

Country or Region: United States

Industry: Education—Primary schools

Customer Profile

The Lemon Grove School District, located just east of San Diego, includes two middle schools and six elementary schools with 4,600 students and 220 teachers.

Business Situation

The school district's Private Branch Exchange system had reached maximum capacity, and it would have been cost-prohibitive to add lines or upgrade the system to add new features.

Solution

The school district implemented a unified communications solution based on Microsoft® software for administrators, teachers, and students.

Benefits

- Expands phone capacity
- Extends existing system
- Engages digital learners
- Improves meeting productivity
- Enhances communications

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The Lemon Grove School District, near San Diego, California, includes eight schools with 4,600 students from kindergarten through the eighth grade. The district needed to find an affordable way to extend the life of its 12-year-old Private Branch Exchange (PBX) system, which had reached capacity and was too costly to upgrade or expand. The school district deployed a Microsoft® unified communications solution—based on Microsoft Office Communications Server 2007, Office Communicator 2007, and Exchange Server 2007—which integrated conferencing and other new communications capabilities with its PBX system. The school district can now easily add phone lines and features at a fraction of the cost of upgrading or replacing its PBX system. The new capabilities will enhance the learning environment, increase productivity, and help users communicate more efficiently.



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Situation

The Lemon Grove School District, located east of San Diego, California, consists of six elementary schools and two middle schools. It is committed to maximizing achievement for every student, accelerating the use of twenty-first-century tools, and preparing students to make a positive contribution to society. The challenge for Lemon Grove, as for many school districts in lower-income communities, is how to achieve those goals in the face of shrinking budgets. Lemon Grove decided to focus on technology as part of its solution to level the field and cost-effectively bring a wealth of learning tools and opportunities to its students.

In the late 1990s, the Lemon Grove School District partnered with Cox Communications to provide high-speed intranet connectivity between the school district and student's homes. This connection links students directly to the Lemon Grove School District private learning network, which provides access to district programs and files and to rich educational resources through a filtered high-speed Internet connection that is available 24 hours a day. Parents also use this connection to communicate with teachers and monitor student assignments.

As the 2007–2008 school year began, Lemon Grove elementary schools (kindergarten through grade 5) had one computer for every two students. Those computers were a mix of workstations running the Windows® XP Professional operating system and thin client devices running the Windows XP Embedded or Windows CE operating systems. At the middle schools (grades 6–8) the district launched the e-Pad program to provide every middle school student with an e-Pad tablet computer that is theirs to use for the school year both at school and at home. Students log on to the network from home using their e-Pads to access classroom information and

supplementary materials to work on assignments.

Having acquired enough computers to equip students with the basic twenty-first-century technology tools, the district faced challenges with its aging phone system. The district had a Nortel Option 61 Private Branch Exchange (PBX) system that was about 12 years old and had reached its capacity for expansion. Five of the district's schools use traditional digital handsets and three of the schools had implemented a proprietary Nortel voice over IP (VoIP) system in 2003. The VoIP system deployed at those three schools was an early release of the technology, and doesn't meet all the standards required of a VoIP environment today. That equipment also had reached the end of the road in terms of expansion.

“We couldn't continue building out the old telephony infrastructure because there wasn't room for any more lines at most of the schools,” explains Daryl LaGace, Chief Technology Officer for the Lemon Grove School District. To add a line card to support another eight phone lines would have cost about U.S.\$3,000. It would have been another \$300,000 just for the software upgrade to add capabilities such as centralized faxing. “That wouldn't have gotten us any new features or put new handsets into the classrooms,” he says. “It didn't make sense to continue spending that kind of money on something that was old and waning in its ability to get support. But we could not afford to replace the PBX system either.”

In addition to basic telephony, the school district wanted to introduce a unified communications solution that would enhance communication among administrators, teachers, parents, and students. The district also wanted to add Web conferencing capabilities that could be used by the administrative staff and faculty, and by

students both inside and outside the classroom.

“We wanted a voice over IP system because that would add expansion potential, support new functionality such as video and audio conferencing, and integrate with our Microsoft Exchange Server e-mail system,” says LaGace. “But we also knew that, with today’s budgets in California, it wasn’t going to be something that the district could do immediately. So we had to come up with a way to maintain our current environment and to expand as we are able and replace existing equipment over time with a VoIP-enabled solution that was truly integrated with our messaging system.”

The Lemon Grove School District looked at VoIP hardware solutions from Cisco and Nortel that had been implemented by other school districts around the area. It also tested Nortel i2004 Internet Telephones in the schools that had the early VoIP systems. In addition, the school district looked at implementing a Microsoft unified communications software solution based on Microsoft Office Communications Server Enterprise 2007, Office Communicator 2007, and Exchange Server 2007 Enterprise Unified Messaging.

Solution

After looking at the alternatives, the Lemon Grove School District chose the Microsoft unified communications solution because it would:

- **Easily integrate with the school district’s existing telephony system** to support a gradual transition as budgets allowed.
- **Cost-effectively add many new capabilities** such as conferencing, and instant messaging (IM). And it provides presence information, which shows in real time whether colleagues are available to be contacted by IM or telephone.

- **Minimize training**, because the Office Communicator 2007 interface is similar to the Microsoft Outlook® 2007 messaging and collaboration client that district employees already use.

The school district engaged DynTek—a Microsoft Gold Certified Partner that has extensive experience with both traditional telephony and VoIP solutions—to help it develop a unified communications framework and a road map for implementing the solution in phases. DynTek sent two engineers to the school district to analyze the network infrastructure, the Exchange Server environment, and the PBX system. DynTek engineers worked with the district staff, Nortel, and Cox Communications for about five days to design the integration between Office Communications Server 2007 and the PBX system, and they worked with the school district technicians to install the software on servers and client computers.

Office Communications Server 2007 is installed on two HP DL 385 servers running the Windows Server® 2003 operating system. A Dialogic DMG 2120 4-port gateway links Office Communications Server 2007 VoIP capabilities to the Nortel PBX system with the help of the Mediation Server, which mediates signaling and media between the two systems. Two T1 lines interface with the Nortel solution, and another two T1 lines are primary rate interface (PRI) channels that come from the school district’s carrier, Cox Communications.

Users on the new system keep their old extension and their internal direct-dialing number. “We needed a seamless way for our extensions to work as they always had, so people on the old system would be able to dial people on the new system through their four-digit extensions and vice versa,” says LaGace. Two of the T1 lines handle all internal traffic. Outbound calls placed by

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people on Office Communicator 2007 go out through the PRI lines that come directly from the carrier, rather than going out through the old PBX system.

In May 2008, Lemon Grove School District started pilot testing the new solution with 250 users—including administrators and teachers. The solution includes the voice and conferencing capabilities of Office Communications Server 2007 and Exchange Server 2007 Unified Messaging. Office Communicator 2007 is installed on workstations and thin client devices that have at least 512 megabytes of memory. Other thin client devices that access the Office Communicator 2007 client through Windows Server Terminal Services are used mostly for IM, shared whiteboard, shared meeting space, and Web conferencing components, rather than for voice.

The new system runs in parallel with the existing phone system. Thus, calls originating from the Public Switched Telephone Network (PSTN) or from internal PBX phones, which are targeted to users on Office Communications Server 2007, are automatically distributed to both systems. Users can take calls on either their PBX handset or the Office Communicator 2007 headset. Similarly, calls originating from Office Communicator 2007 that are targeted to internal PBX users or external parties are automatically distributed to the PBX system.

Initially, the voice capability along with either USB headsets or LG Nortel handsets was only rolled out to the IT staff and to school administrators. The voice capabilities along with USB headsets will be rolled out to the teachers in fall 2008. A few middle school students also have Office Communicator 2007 installed on their e-Pads and are using the conferencing capabilities to view presentations in class and to collaborate on reports and projects with other students

either in the same classroom or from their homes over the school district’s learning network. When the district has finished setting up group policies to control the use of IM it plans to roll that out to students as well.

Benefits

By integrating new VoIP, conferencing, IM, and unified messaging capabilities with its PBX system, Lemon Grove School District will be able to extend the life and capacity of its existing system and add new unified communications capabilities. This will enhance internal and external collaboration as well as engage students with the technologies that they need in order to prepare for a productive future.

Expands Phone Capacity

The most immediate benefit of implementing the Microsoft unified communications solution was that Lemon Grove School District was able to expand phone capacity at an affordable cost. Moving 250 users to Office Communications Server 2007 helped to free up existing PBX lines. “We immediately used the VoIP functionality of Office Communications Server 2007 to deal with the capacity issue where we couldn’t add lines,” says LaGace. “In this first wave of deployment, we’ve freed up about 95 of the old digital lines, which we can redistribute to places that need voice service that we couldn’t afford to give them because of the high upgrade cost.” LaGace estimates that adding a line with Office Communications Server 2007 costs approximately \$100 per line compared with approximately \$375 per line added to the PBX system.

Extends Existing System

From a cost standpoint, a total replacement of its existing PBX system was out of the question for Lemon Grove. However, by using the Microsoft unified communications solution, the district was able to integrate the new VoIP, IM, unified messaging, and

conferencing capabilities into its existing system at a fraction of the cost of a new PBX system. And the addition of these new capabilities paves the way for a transition from the PBX system over time.

“Due to the current budget crisis, we’re not in a spot to do a wholesale replacement,” says LaGace. “With the Microsoft unified communications solution, we have a strategic plan and an infrastructure that will allow us to move the whole district to this solution as budgets become available. In the meantime, Office Communications Server 2007 allows us to provide voice service to people who have never had it, and to upgrade users to many innovative communications features without disrupting our operations.”

Engages Digital Learners

Students in the Lemon Grove School District were already able to access classroom information from the school district Web site 24 hours a day to get information about lessons and related activities. The addition of conferencing, IM, and VoIP features in the Microsoft unified communications solution will allow middle school students to collaborate effectively on projects both inside and outside the classroom from their homes within the protected environment of the Lemon Grove School District network.

The conferencing functionality will also make it possible for students who are absent to participate in lessons. “Students will be able to call into the class on Office Communicator 2007, see what the teacher has on the screen, and follow along and participate in the discussion by voice or through IM,” says LaGace. “These kids are digital natives, and our efforts to recognize their needs are having a huge impact on why kids want to come to school and what makes our programs so successful. After we rolled out network access to our students in fall 2007, our attendance went up 1.25 percent and

that level continues to be sustained for those students participating in the program.”

Improves Meeting Productivity

A subcommittee of technology directors across California, which includes LaGace, recently convened a meeting using the Web conferencing capability of Office Communications Server 2007. “We were able to do some goal setting and strategic planning using Office Communications Server 2007 conferencing that might otherwise have required a face-to-face meeting,” says LaGace. “We weren’t able to schedule a face-to-face meeting because of everybody’s time constraints. We were very concerned about the productivity of conducting the meeting through a conference call, but it turned out that people were highly engaged with the process and it may have been more productive than meeting in person. Plus, we saved a tremendous amount of travel time and travel cost.”

The school district expects to expand its use of Office Communications Server 2007 conferencing for staff development, coaching, and administrative meetings in the 2008–2009 school year.

Enhances Communications

Microsoft Exchange Server 2007 Unified Messaging combines voice mail and e-mail in a single inbox to help increase productivity for Lemon Grove teachers, administrators, and IT staff. This capability makes it easier for teachers to stay in touch with the community and with parents, because they’ll be able to review and respond to all of their electronic communications within a single interface. When unified messaging is fully deployed, teachers will be able to just click on a link in Office Communicator 2007 to respond either in e-mail or by voice. And they’ll be able to see the phone numbers of calls that were received even if the caller doesn’t leave voice mail.

For More Information

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For more information about Lemon Grove School District, call (619) 825-5735 or visit the Web site at: www.lgsd.k12.ca.us

The presence feature in Office Communications Server 2007 has already helped make communications more efficient in the IT department. "My staff knows that when my presence indicator is red, I'm not available, and if they send an IM, they won't get a response," says LaGace. "The presence capability in Office Communicator 2007 also makes it easier for me to see when my staff is available so that I can send an instant message to them with a high expectation of a quick response."

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