

## Colonial Baptist Church—Cisco **Networking** Academy Does IP Telephony

**This was not your usual homework assignment. High school students installed a Cisco IP Telephony solution at nearby Colonial Baptist Church for their Cisco Networking Academy (CNA) senior project. The project proves both the success of the CNA program to prepare students for real-world careers and also the straightforward deployment of Cisco CallManager and Cisco IP Phones in a network based on Cisco AVVID (Architecture for Voice, Video and Integrated Data).**

### Background

With 3000 attendees and still growing, Colonial Baptist Church has strong ties with its community around Cary, North Carolina. In late 1999, the church began construction of a 3-building campus on 40 acres to meet the needs of its burgeoning congregation. The new campus has a sanctuary, administration building, and a classroom building, all two stories high. About the same time, Athens High School in Raleigh, North Carolina started a CNA program, headed by Bill Reece, Curriculum Integration Coordinator.

Was this the beginning of a match made in heaven?

The church uses its network to support a SQL database system designed especially for churches that enables centralized management for everything the church does. The staff also relies on the network to produce church schedules, import graphics, and communicate with each other and with colleagues via e-mail.

### Challenge

As with most non-profit organizations, the church building project took years of careful planning and financial management. The resulting complex had to sustain church activities and growth for decades. What's more, the church needs to closely manage its operational costs, keeping them as low as possible. Accordingly, the life cycle of any technology investment must be longer than is typical in the corporate world.

As a member of the congregation, Cisco Account Manager Scott Wertz had an interest in the success of the building project and the resources to contribute to it. He approached the project leader, Mike Murray, now Director of Finances at Colonial Baptist, and introduced him to

**Figure 1**  
IP Telephony at Colonial Baptist Church





converged networking with Cisco AVVID and IP Telephony. Murray recognized this as an opportunity to reduce operational costs over the separate data and PBX networks he managed at the old church site and improve day-to-day communications and productivity. With intelligent features enabling multiservice applications such as video conferencing or e-learning, the same network would also be ready to support possible future projects such as collegiate or seminary courses.

Murray confesses that at the time he had neither the technology background nor the expertise to adequately compare the Cisco AVVID and IP Telephony solution with other options in the market. He depended upon Wertz's vested interest in the project's success and upon their relationship to obtain a beneficial result. "I learned a lot in a little bit of time," says Murray. "Cisco AVVID would be a great base to grow on. We were technology uneducated, but when Scott showed us how we could use Cisco Unity to integrate our voice-mail and e-mail on our PCs, we really liked it."

A potential obstacle to the idea was the budget. The finance committee had slated a certain amount to move and upgrade the existing Norstar PBX system from the old site to the new one. Wertz successfully worked the numbers and solicited donations to make it possible to upgrade to a state-of-the-art Cisco AVVID network with IP Telephony for the same amount of money. With that done, says Murray, "The Cisco AVVID solution was the obvious direction to go. We can't keep putting money into legacy systems."

Installation cost was a significant line item and potential deal breaker. Wertz lined up Dimension Data as a systems integrator, then spoke with Cisco Consulting SE Doug Foster, who suggested that the church ask CNA students to do the job. Foster had helped start and nurture the Athens High School CNA program and asked Reece about replacing the usual fourth-semester senior project with the church project. Foster would teach Cisco IP Telephony technology to the students and closely monitor the design and installation process. Reece and the students eagerly agreed to the idea. "You guys are the prime contractor," Foster told them.

## **Solution**

At Athens High School, the students' enthusiasm was evident from the start. "The amazing thing was how quickly they learned CallManager," says Reece. "I was learning alongside them. Foster walked us through the process of configuring CallManager and setting up Cisco IP Phones." Foster then brought Murray to the school, where students interviewed him to learn customer requirements, anticipated growth, and the features the customer wanted. This information helped them properly configure the Cisco 7835 CallManager and Unity servers, the Cisco Catalyst 3524-PWR Ethernet switches, the Cisco DT24+ PRI gateway, and the Cisco 1720 WAN router. "The students had spent a lot of time learning how to configure the equipment," says Murray. "They showed me how to use the system. A couple of them were very knowledgeable."

One hotshot student, Zach Coburn, thrived on the project. "The equipment is easy to use once you know how," he says. "Doug [Foster] would let us figure it out and would make us use problem-solving skills to go through the process. When we got CallManager and the router working in the lab at school, our first outside IP Phone call was to Doug on his mobile phone. I said, 'I told you we'd get it working!'"

Dimension Data provided the principal design and specifications for the project and did the "heavy lifting" part of the CallManager and Unity installation, says Joe Hewitt, Solutions Architect at Dimension Data. As systems integrator, Dimension Data team coordinated the activities between the Colonial Baptist staff, the Cisco account team, the wiring contractor that the church hired, and student activities at the church. "We recommended the best

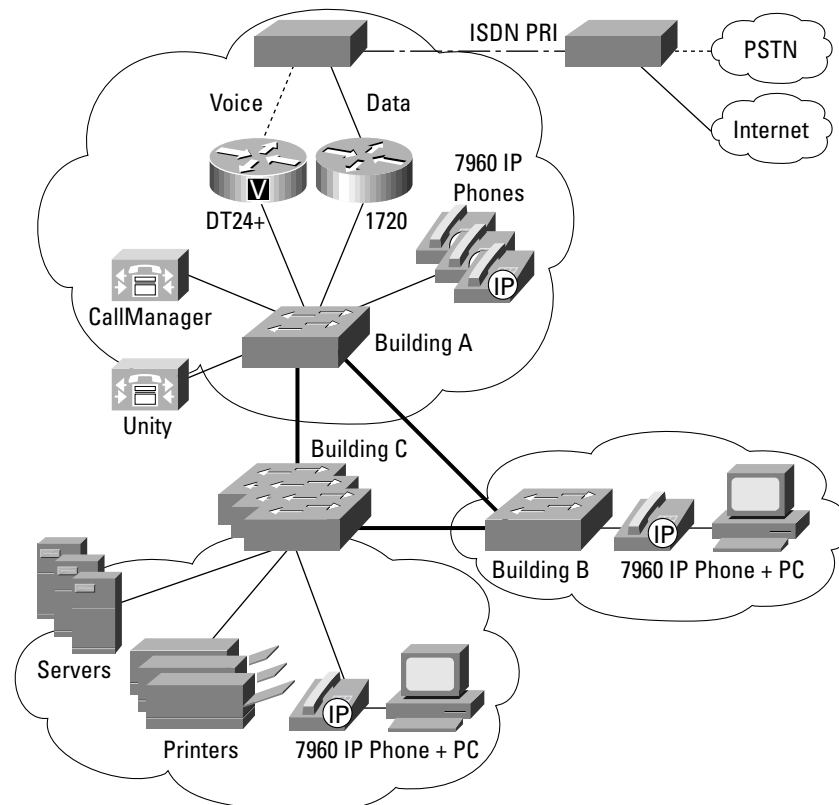


practices-based design to the church, since they were unfamiliar with the scope of such a project,” says Hewitt. “Fortunately, the Cisco IP Telephony solution is very straightforward, and worked as advertised, so we could do a quick deployment without any hiccups.”

At the church itself, the students’ first task was to trace and properly label the Category 5 wiring. “The folks that did the data wiring did a poor job,” explains Reece. “The students tracked down and labeled all the ports and outlets. They were very enthusiastic and proud of their ability to fix it.” Hewitt concurs, observing the students’ open minds, “They didn’t realize how much they were learning. IP Telephony is more intuitive and robust than a traditional PBX, so it’s easier to learn.”

The three church buildings are interconnected with a fiber network. The data closet in the administration building houses the WAN router with a fractional T1 line for Internet access, the Cisco CallManager and Unity servers, and the PSTN gateway. Five Cisco Catalyst 3524 switches with inline power connect the three buildings using a Gigabit Ethernet backbone (Figure 2).

**Figure 2**  
Colonial Baptist Church IP Telephony Network



So far, the network has approximately 50 Cisco 7960 IP Telephones, located in the administration and sanctuary buildings. The church receptionists—who answer hundreds of calls per day—now use WebAttendant software to manage calls more effectively because at a glance they know who is on the phone.

## Service and Support

Colonial Baptist has already seen benefits of Cisco service and support. When an electrical surge blew out two IP Phones, Cisco replaced them right away and helped verify functionality in the rest of the network. Cisco TAC also helped resolve a CallManager software configuration issue that prevented staff from placing international phone calls.

## Results

The network was up and running well before the church officially moved to its new campus in May 2001. Since installation, Colonial Baptist hired Brad Bogart as Technology Coordinator. He started tweaking the VoIP features almost immediately and activated firewall capabilities in the router to enable secure remote access for staff.

Budget continues to be a presiding factor over future expansion of the Cisco AVVID network. "Even if the Cisco equipment had not been donated, there would have been a lot of extra cost with keeping the old PBX," says Bogart. "We can add users ourselves without calling a PBX contractor or the local phone company. It's faster and much less expensive." Bogart is also investigating the use of wireless networking solutions in the classrooms, which have not yet been wired for cost-management reasons.

The deployment was unique for many reasons, muses Foster, but "my reward was getting to know the students and enjoying how they got both a real-world experience and exposure to hot new technology. I loved their talent, their raw curiosity, and spark of enthusiasm." Murray appreciates the amount of time that the students invested in the project's success, saying, "The Cisco Networking Academy program gives students a leg up as they graduate and move into the world."



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