Holy Cross High School Graduates to a New Network

A generous gift allowed a private high school to upgrade its antiquated network infrastructure. The result: a future-proof network plus educational benefits.

By Masha Zager / *Broadband Communities*

Holy Cross High School in Waterbury, Conn., is a college preparatory school with 730 students from around the region. It has an intensive academic program (nearly all students go on to college), a successful athletic program and a thriving arts program. Until recently, however, it didn't have up-to-date technology.

Its campus network was 15 years old, built on an ad-hoc infrastructure whose accessibility and capacity were limited. Over time, IT staff had patched up the network with donated equipment, usually to fix urgent problems. Students and administrators needed a better solution.

An opportunity arose in December 2013 when an anonymous donor gave the school a transformational gift of $3.4 million. The gift allowed Holy Cross to address several aspects of its strategic plan, including upgrades to facilities, programs and infrastructure.

One important infrastructure project to which gift funds were applied was an upgrade of the campus network, including ISP, structured cabling, switching and the wired and wireless Internet network.

School IT personnel knew what they needed, but they didn't have the skills to design and implement the upgrade. Timothy McDonald, the school president, says, "It was evident that we had exhausted internal expertise and were at the point where we recognized it was time to go outside. We needed a solutions provider that understood the complexities of a private school that includes students, faculty and staff all accessing the Internet at different times in the day, on different devices, in a variety of different places in the building."

Enter RESOLUTE Partners – a firm based in Southington, Conn., that engineers, installs, operates and maintains wired and wireless networks. RESOLUTE won the opportunity to engineer a unified solution to deliver on-demand wireless Internet access to the Holy Cross campus and all the students, faculty, staff and guests.

SITE REVIEW

RESOLUTE began by doing a thorough site review. This was an opportunity for engineers to visit the campus, determine the locations that would deliver the required level of Wi-Fi coverage throughout the school, and decide what hardware was needed to meet the school's capacity demands.

"We performed both physical analysis and logical analysis to determine where the heaviest requirements were," says Frank DeMasi, RESOLUTE vice president of information technology.

The team identified several distinct coverage areas, along with the functions performed in each area and their intensity of network usage. For example, science rooms require more network capacity than language rooms because students use more virtual books and wireless projectors in science classes and tend to stream more information from the Internet in real

time. Auditoriums have a higher user density than classrooms but a lower intensity of usage.

The engineers also studied the devices students used in various areas of the school – it's not uncommon to have two or three devices per student. Understanding the devices and how they were used made the network more flexible as well as useful.

Finally, the site review team looked at the school's future plans for using technology. Over time, the school will use more and more wireless technology, but the main building offers what DeMasi calls a "worst-case scenario" for wireless: cinder block and concrete construction with hard ceilings. To support the school's growth plans, engineers decided to run fiber to each corridor and add enough intermediate distribution frames (IDFs) so that every wireless access point would be within about 200 feet of an IDF. During site review, they mapped out fiber paths and IDF locations for easy access, using existing pathways if available. In one case, to accommodate a major renovation of the athletic area, the team decided point-to-point wireless would be less expensive than fiber.

IMPLEMENTATION

Working from the approved site review action report, RESOLUTE created a detailed implementation plan for the school, including additional fiber runs, additional IDF locations, access point types and locations and network backbone upgrades. Once the installation was completed, RESOLUTE implemented the detailed configurations for the network, including SSIDs and VLANs, and then completed the network testing. The entire project took just six weeks.

Though the school network was originally only wired, IT staff had added some wireless access points to accommodate students' use of mobile devices. By contrast, the new environment is predominantly wireless, with a few wired computers in areas such as the library and training labs. Wireless equipment from HP Networking was used throughout the project because HP's wireless access points and controllers allow for many possible network configurations. This flexibility allowed RESOLUTE to meet both the school's current needs and its anticipated future needs at a reasonable price.

Also required was the ability for students, faculty and staff to move around the campus without having to log in and out of the network. To accommodate this, three wireless networks are now broadcast throughout the campus. One allows students to access the Internet via their own cell phones (the school can turn off this network to keep students from spending too much time on applications such as Facebook). The second is for administrative staff, and the third is for students to access the school curriculum via school devices.

All access points support both 2.4 GHz (for legacy devices) and 5 GHz (for newer devices). DeMasi explains that as device technology moves to the 5 GHz range, traffic will shift to that frequency range, where more bandwidth is available, without users or network administrators having to take any action to move it there.

Because the school is moving its curriculum to the cloud, more Internet bandwidth – and redundant bandwidth – is now a necessity. In place of the T1 circuit that connected the school to the Internet, RESOLUTE brought fiber circuits from two different service providers, with the primary fiber provisioned at 100 Mbps and the secondary one at 50 Mbps. The bonded capacity of the two circuits is 150 Mbps and can expand over time. A high-availability firewall pair connects the school to the circuits.

EDUCATIONAL BENEFITS

Today, the school reaps educational benefits from its robust, ubiquitous wireless network. Michael Blanco, CEO of RESOLUTE Partners, explains that students and faculty walk around the school with their laptops. They can have discussions in hallways, do research in classrooms and collaborate in small groups wherever they are. The library is no longer the only place to find information.

Easy access to educational resources makes it more practical for the school to offer accelerated and specialized classes. "They're having conversations now about a 'barbell strategy,'" Blanco says. "That means they would offer common teaching to a large group of students but stretch the boundaries at the remedial end and at the advanced end. They're just at the infancy of that project."

"It's such a challenge for schools that the technology moves so fast," Blanco adds. "That's why we're focused on the consultative side of the process, rather than forcing them into a whiz-bang solution. Now they have the network bones to go where they need to go." ❖

Masha Zager is the editor of ***Broadband Communities****. You can reach her at masha@bbcmag.com.*