Allegany Wireless Network Supports Full Motion Video

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The presentation will cover innovative communications solutions used by Allegany College of Maryland, which operates five instructional sites in three counties and two states. AC's fully integrated communications network, combining voice, video, data and Internet, uses new-generation wireless microwave technology to hurdle mountainous terrain and leapfrog a cumbersome patchwork of conventional communications providers. In creating its own communications network custom-designed for its needs, the college thus improved connections for its approximately 500 employees and thereby strengthened education for its 3,200 credit and thousands more continuing education students.

AC's Associate Dean of Computer Services, John Moore, will explain how the college devised and implemented a communications system that is not only better and more reliable but less costly. The Cumberland-based college's journey down this communications highway began when it branched out, in 1989, to offer courses in Somerset, Pa., and a year later in Everett, Pa. Both towns are in neighboring Somerset and Bedford counties to the north. For several years, communications needs were relatively simple, as courses were held in the evening at Somerset and Everett high schools and local campus administrative space was borrowed where the college found it.

Communication needs grew when each campus acquired its own quarters in 1994 (Somerset) and 1995 (Bedford) and expanded its schedule to include daytime classes, added more academic programs and saw enrollment rise. The college assembled a communications system using conventional telephone service providers, but doing so meant it had to work with five phone companies – an unwieldy arrangement at best. While voice transmission was satisfactory, transmission of computer data, over the same modems used by residential Internet customers, was not adequate for the organization. Soon, the college sought to expand courses at its two Pennsylvania campuses by introducing distance-learning technology through a compressed video signal carried through phone lines. But the system proved less than satisfactory for this purpose, showing itself to be only as strong as its weakest link. There were occasional breaks in service, and it was costing too much for a long-distance call.

The college realized it needed a permanent, continuous link among its three college campuses, so it went to a higher capacity system using a T1 line more suitable for business applications. A full T1 line linked the Cumberland system to the outside world, which in turn was linked to its two Pennsylvania campuses with a half T1 line to each. Communications improved and costs were stabilized, but there were still shortcomings. When a circuit went down, we had to deal with five phone companies, it was a real challenge trying to get it all back up and running again. Then, there was the expense. When the project was first started the monthly cost was around

$4800. Every few months, the bill would go up. By the time the college had paid its last such bill, in December 2000, the tab had risen by more than 30 percent.

Aware of emerging wireless technology, we tried to interest representatives of large companies that we met at information technology conferences. But given the college's comparative small size and its long distance from the metropolitan markets, none could be drawn. We later turned to TWR Communications after we realized the Cumberland-based firm had added wireless capability to its services. The company developed a proposal that included radio transmitters and receivers and rooftop dishes to connect with its microwave towers atop the mountains. The TWR agreement provided the college needed wireless equipment, from Stratex Networks Corp., and maintenance for five years, after which AC will own the equipment. Monthly lease payments with TWR, plus rent of a non-TWR tower on Tussey Mountain in Bedford County, are significantly less than previous communications bills the college was paying. Moreover, the amount will remain stable over the five-year period. Implemented in January 2001, the wireless communications system was instantly successful. Reliability has improved with not one break in communications faulted to the new network. Quality of signal, including video picture, has been upgraded. And data transmission has been increased, because the wireless network's bandwidth is greater than that of its phone-line based predecessor; a full T1 line, carrying 1.5 megabits of information, now runs to each Pennsylvania campus. In April 2001, the college arranged its Internet service, which to that point had some reliability shortcomings of its own, through TWR. Where its service formerly came through a three-quarter T1 over phone lines, the college now receives the Internet via a full T1 line delivered by the wireless technology system. And the monthly bill is now two-thirds of the previous expense. The new system provides more bandwidth for less money. It supports voice, video, data, and Internet, all at T1 speed.

The college's new Gateway Center, home to the School of Hospitality Tourism and Culinary Arts, is the latest of AC's five instructional sites to benefit from this wireless communications technology. This site went on line with a wireless connection in fall of 2001. The Faculty and students at that Baltimore Street location are now fully integrated into the college communications network using a wireless connection that includes voice over IP technology.

In the fall of 2004 as the use of the network continued to grow the college started planning for the need to again increase bandwidth. Internet usage had continued to grow and problems occurred with access to some of the more advanced software at the Somerset Campus. We decided to upgrade our video system to include full motion and continuous presence so we started planning for the upgrade of our wireless WAN. This new upgrade will provide increased bandwidth in the main core of the wireless network to support 100 megabits of IP bandwidth and it also offers T1's to carry voice traffic to our Gateway Center. The new link to each Pennsylvania campus has been upgraded to support 50 megabits of IP bandwidth to provide for full motion video and voice over IP. The upgrade includes new radios to provide the increased bandwidth and new network switches to allocate the bandwidth to the required locations. This presentation is a follow-up to a session from 2003 and will focus on the video upgrade project and the network upgrade project that took place during the fall of 2006.