

## DELIVERING BROADBAND TO SCHOOLS USING WIRELESS

### ALLEGANY COLLEGE OF MARYLAND

#### CHALLENGE

Amongst the Appalachian Mountains in the eastern United States, Allegany College of Maryland has five educational sites. Allegany College required an upgraded communications network with excellent VLAN capacity to improve inter-campus communication, especially "virtual classroom" data for distance learning. Distance Learning relied on broadcast video and audio to be delivered live and of the highest quality.

#### SOLUTION

An Eclipse Ethernet radio network provides advanced Internet, VoIP, video and other data transmission. Up to 100 Mbit/s of IP/Ethernet bandwidth for the core network, with 50 Mbit/s to the network edge.



"The biggest win for our educators is continuous presence, having each remote (learning) site displayed precisely on separate displays to enable true multisite collaboration. Students can now attend classes without traveling 40 or 50 miles."

Ken White  
 Director of Media Services,  
 Allegany College

#### INTRODUCTION

When Allegany College of Maryland (ACM) upgraded their broadband network to 100 Mbit/s bandwidth, little did they understand the huge impact such a simple increase in capacity would have on their five school network in upstate Maryland and southern Pennsylvania.

Because ACM is located in the Appalachian Mountains where students could easily drive 50 miles to get to a classroom, the college developed a Distance Learning program that permits students to attend the nearest campus or learn from home, and enjoy access to all the courses and instructors wherever they may be offered. With the new broadband network, a combination of on-line web-based courses, tele-course (self-paced) and three-way interactive courses could now be offered. As a result, Allegany College has made huge leaps in providing its residents "anytime, anywhere learning".

With many more people desiring retraining and new career moves because of the current economic slowdown, Distance Learning is an affordable and efficient means for the college to reach more of its residents. ACM has seen its enrollment increase over the past few years, and its Distance Learning program is very popular.



### **NO MORE BROADBAND POVERTY**

In 2001, Allegany College decided that they were ready to implement bigger plans for true distance learning curricula, to improve IP-based services to classrooms and laboratories, and to accommodate additional facility and administrative services.

The original T1-based communications network had become inadequate, was increasingly expensive to operate, and could not support plans for “virtual classrooms” at the two Pennsylvania campuses. Using the line-based network to transmit compressed video signals was simply not satisfactory.

In two phases, Allegany College upgraded their aging network to a new broadband network with 100 Mbit/s of IP/Ethernet bandwidth, including 50 Mbit/s of IP/Ethernet at the network edges to satellite campuses in Pennsylvania. Allegany College would no longer suffer from broadband poverty.

### **NEW MICROWAVE NETWORK DELIVERS EXTRA COSTS SAVINGS**

In 2001, a new Aviat Networks Eclipse microwave network was installed. This network greatly expanded the capacity of the entire telecommunication network for the college. The high capacity microwave network of 16 radios connected Cumberland, in western Maryland, with Everett and Somerset in southern Pennsylvania. These three campuses would form the core of the Distance Learning community at ACM.

The new system was an immediate success because the cost savings were more than expected and the network was far more reliable than its scable-based predecessor. ACM was delighted with their investment and preceded onto the next phase for even higher broadband capacities to support more advanced video-based learning applications.

### **TRUE DISTANCE LEARNING NEED BROADBAND BANDWIDTHS**

The main challenge to true Distance Learning was to provide full motion and continuous video services across the network. This would be necessary to deliver on the more bandwidth intensive, 3-way interactive courses that would connect students and instructors in up to three locations, in real-time.

### **LESS EXPENSE, MORE BANDWIDTH**

By the beginning of 2007, the college upgraded the Eclipse radios in the network core to support true broadband capacities: 100 Mbit/s of IP/Ethernet. The outdoor RF units and antennas were re-used, and small equipment changes were made to the indoor Eclipse Intelligent Node Unit.

Expanded network switches were installed throughout the network to efficiently allocate proper bandwidths to each required location. Special care was needed to configure the network capacity mapping so that bandwidth allocations for VoIP, video, main data trunk, and Internet feed were precisely assigned.

Allegany College was dutifully impressed with the substantial cost savings: the Eclipse-based system provided more bandwidth for a lower operational cost, at a savings of 35% less than the pre-Eclipse cost.

### SHARING SCARCE RESOURCES

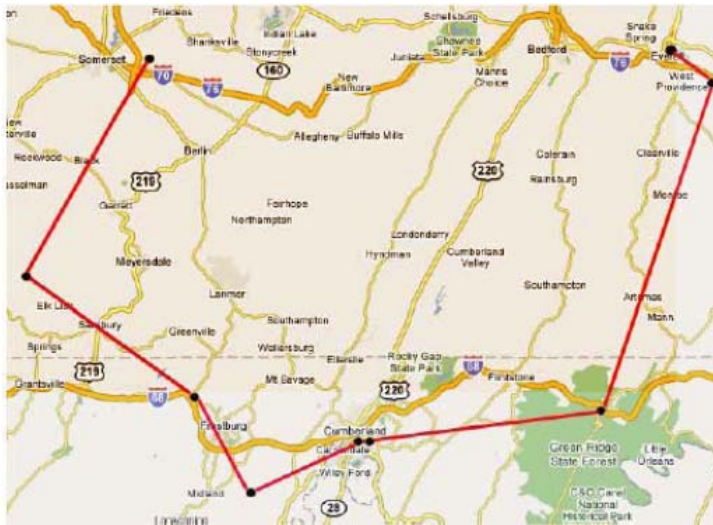
The Distance Learning program permits Allegany College educators to conduct a single class session spanning three campuses within a 60 mile radius eliminating the need for travel by students and teachers alike. Without the broadband network, the ability to share scarce or unique resources, such as specialized courses and teachers, would not have been possible.

Allegany College’s “anytime, anywhere learning” now features many 5 credit course in 14 academic areas, truly enabling equal access to affordable, high quality higher education for the residents of the area.

### ALLEGANY COLLEGE DELIVERS ON ITS PROMISE TO STUDENTS

With two phases of deployment now complete, Allegany College’s broadband microwave network has drastically improved its reach to deliver “anytime, anywhere learning” to its residents.

Broadband network capacity has improved on the curriculum choices available to all students from any teaching location. As a bonus, the network operates with expanded bandwidth at 35% less cost than their previous network.



Eclipse network connecting the home site at Cumberland, MD with Somerset, PA (35 miles) and Everett, PA (37 miles) in the Appalachians.