



Mobilizing Wireless: WLAN at New Mexico Military Institute

Wireless LAN is a critical tool for schools trying to turn out technologically grounded students who can go straight into the workforce. But in classrooms where 30-40 users may all need to download the same file at the same time, capacity issues can take a bite out of system performance.

Poor Wi-Fi performance is a problem in any school, but for a military prep school, where students' schedules are tightly programmed from reveille at dawn to the final sounding of "Taps" at night, it's a disaster. So when New Mexico Military Institute decided to extend wireless connectivity to its entire campus, they looked for the WLAN that would deliver the capacity they needed without shortchanging coverage.

An Extricom wireless system was their choice, beating out the market leaders on operational flexibility and performance.



30 or 40 students, each with their own laptop, might be trying to log on and work.

Traditional WLANs handle this scenario poorly. When traffic is high, they can become unstable because the system's uncoordinated APs generate co-channel interference. The 802.11 protocol deals with this interference by automatically retransmitting packets. This causes more wireless traffic, more interference and more retransmissions. The result is frustrating delays, slow transmission speeds, or even total system failure, leaving many schools wondering if the promise of the wireless classrooms is little more than a mirage.

100% Coverage

Royce Braggs, the Manager of Network Operations at New Mexico Military Institute (NMMI), was familiar with the technical challenges of wireless, but with a requirement to provide coverage for the prestigious military prep school's 300-acre campus in Roswell, New Mexico, he had to find a way to overcome them. The school's administration had asked him to implement a system what would support network access for 1000 students and 300 plus faculty and staff anywhere on campus.

NMMI's objectives were not just limited to the usual Internet access either. "Our vision was to cover the campus 100% indoor and out, but we also wanted VoIP and to do RFID tagging for inventory control," stated Braggs. "Of course, we couldn't do everything at once, so we were looking for a system that would support

A Few Good Questions

How effective wireless networking is in the classroom can be analyzed a million different ways, but ultimately it comes down to a few simple questions. The most important one is capacity – can every student get on the system at the same time and download without it slowing to a crawl? Application support is another angle – can the WLAN support data, voice, and video equally well over the same infrastructure?

Last, but not least, is coverage – is wireless accessible everywhere? In a modern school, teaching doesn't just take place in front of a blackboard, it happens anywhere on the school grounds, making the entire campus one giant classroom.

Chasing a Mirage

It seems obvious that every student has to be able to access the Internet to make their learning experience effective. But the obvious is not always reality in a user-dense environment where

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Royce Braggs
Manager of Network Operations
New Mexico Military Institute

Project Scope

Deploy comprehensive wireless LAN to provide 100% coverage on 300-acre campus of prestigious military prep school in Roswell, New Mexico. System was required to support data, voice, and video applications for user population of 1,000 students and 300+ faculty and staff.

Solution

Mix of Extricom EXSW-1200/2400 switches and EXRP-40 UltraThin access points

System designed to provide coverage to 19 major buildings on NMMI campus, including barracks, academic facilities, and athletic facilities

Results

Extricom WLAN vastly improves wireless system capacity, allowing multiple users to access system in single location at maximum data rates

Easily expandable and scalable system gives NMMI ability to deploy future applications without system re-design or upgrade

System supports up to four 802.11 a/b/g Channel Blankets per AP, effectively enabling multiple separate networks from same infrastructure

whatever application – voice, data, or video – we wanted to put in place down the road.”

Looking Past the Incumbent

Braggs' initial thought was to go with NMMI's incumbent vendor, Cisco, which had provided much of their wired network. From a price perspective, however, the Cisco WLAN solution carried a steep upfront cost, and he wasn't sure if it could fully support a diverse range of applications and large number of users.

Other Wi-Fi manufacturers in the space were considered but rejected. Finally Braggs took a look at Extricom WLAN, and knew he'd found his solution. "The thing that drove us toward Extricom was performance – we'd be able to get throughput that rivaled hardware if we did it right."

Considering Extricom

What makes an Extricom system ideal for the type of environment NMMI represents is its patented Channel Blanket™ architecture, which supports both coverage and capacity at full performance. Inside the Channel Blanket, all access points transmit on the same channel, and transmissions are centrally coordinated by the switch, not the individual AP. The resulting blankets of wireless coverage provide robust, resilient wireless connectivity.

An Extricom system allows access points to be placed without having to take co-channel interference into account. User-dense environments such as classrooms can be supported by deploying APs in densities traditional wireless systems would not tolerate. This minimizes packet re-transmission and translates to the best possible throughput and performance for large numbers of users.

TCO considerations entered into play as well, according to Braggs. "The Extricom system is an edge solution, which allows us to deploy it gradually, building by building, but at the same time it features centralized management which can be overlaid later on. Other systems required a large initial buildout and didn't offer the features that Extricom did. We looked at the long-term picture and Extricom won hands-down."

'Drag-and-Drop' Simplicity

Working with Extricom engineers, the NMMI IT team performed a 120-day pilot which allowed

them to thoroughly stress-test the Extricom WLAN and figure out how it would interact with their legacy Cisco LAN. Once satisfied that the system would match their requirements, NMMI proceeded to roll it out campus-wide.

The masonry, concrete, and steel construction of NMMI's buildings might have posed a challenge, but didn't prove to be a factor thanks to the flexibility of Channel Blanket architecture. Essentially, Extricom APs can be placed wherever needed, vastly simplifying deployment.

The implementation plan was drawn up without the extensive surveys required by a traditional wireless solution. The project team made extensive use of Extricom's deployment tool, which allows engineers to simply determine the data rate required for a particular building, then drag-and-drop APs onto a floor plan accordingly.

According to Braggs "Extricom assured me everything would be covered, and so far that's been the case. The system was pretty easy to deploy, so we didn't have to call up Extricom unless we ran into something really difficult."

Planning for Today and Tomorrow

With the network in place and in production, NMMI has started to reap the benefits in terms of improved student productivity. As Braggs sees it, "The Extricom system allows more people to get on the wireless network without it bogging down. It's a pretty simple concept, but I think that it's made a huge impact in terms of faculty trying to achieve academic goals with our students."

The system will also support RTLS to keep tabs on school equipment and a VoWLAN phone system which will encompass providing a phone to every cadet so that they can be contacted anywhere on campus. For Braggs, this ability to leverage the current system to easily meet unforeseen future needs is the ultimate value.

"We need to support our current services, but it's also essential to have scalability and expandability. Our WLAN has to allow us to fully leverage the applications of today but also tap into technology improvements down the road without doing major overhauls. The Extricom system clearly can do that."