



Glynn County Schools Brings Wireless Technology to the Classroom

Glynn County, Georgia, long known for its beautiful beaches, golf courses, and historic sites, can now claim another distinction: incubator for innovation in educational technology. Using a "21st Century Learning Environments" grant from the Georgia and US Departments of Education, the Glynn County School System is undertaking a long-term project to bring mobile, pervasive Wi-Fi networks to all of its elementary and secondary schools.



Glynn County's objective is to support and enhance the academic achievements of its over 12,000 students through the use of information technology. In a world where knowledge of computers is a cornerstone of economic prosperity, it is critical to ensure that every student crosses the "digital divide" and becomes technologically literate by the end of eighth grade. Finally, the project will help more than 1,100 Glynn County teachers integrate technology directly into their everyday lesson plans and professional development efforts.

Wireless as an Educational Tool

Elementary and secondary education presents unique challenges from the perspective of information technology. Shifting demographics can cause a classroom with 15 computer learning stations to suddenly have to accommodate 45 students, limiting student access to needed resources. And IT staff is often overextended by having to support a disproportionately large user base. Wireless technology and mobile computing are a strategic asset that can address many of these issues. Easy-to-maintain pervasive wireless infrastructure will also mean a lot less time that IT personnel spend troubleshooting wall jacks.

classrooms, hallways, and assembly areas, a challenging environment for achieving ubiquitous and reliable wireless coverage.

The IT team was faced with the classic dilemma of traditional, cell-based WLAN: while more APs increase coverage, a corresponding boost in bandwidth is not realized because of increased co-channel interference. Less APs may achieve reasonable coverage with less co-channel interference, but this means accepting lower data rates and bandwidth for all users. In the end, coverage and bandwidth cannot both be maximized in a cell-based solution.

Technology aside, Glynn County had another challenge: minimizing project risks. With limited budget and personnel, Rupert and his team could not afford a misstep. Whatever technology they selected had to work the first time; a drawn-out process of trial and error would be disastrous to both their budget and reputation. "Essentially, I needed the right solution, right now," Rupert explained.

The Realities of WLAN in Schools

No one knows this better than Eric Rupert, the Systems Analyst for Glynn County Schools. With 5,000 PCs to be managed in Glynn County's 17 schools, he and the rest of the IT staff are a bit like firefighters, focused on the day-to-day support needs of such a large environment. Acquiring a wireless solution that would require significant staff hours for them to implement, and then administer, was therefore out of the question.

Dense user populations in schools create design issues that rule out more conventional market solutions. A single classroom might contain 30 students using their laptops to search the Internet, send e-mail, or download learning applications, making maximum wireless capacity and user bandwidth essential. Also, schools are a sprawling, steel and concrete maze of

Finding the Right Solution

All of this added up to sizeable project challenges. As Rupert observed, "We had been a bit reluctant to deploy wireless because it's such a pain in the neck." But inaction was not an option, and a thorough comparison of vendor offerings lead Rupert to select Extricom.

He was taken by the remarkable combination of performance and simplicity of the system. "Even without being an expert in Wi-Fi, within hours of receiving it, we had a working solution

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basically we were waiting for something like the Extricom system to come on the market

Eric Rupert
System Analyst
Glynn County School System



Project Scope

As part of 21st Century Learning Environments initiative, deploy WLAN in 17 primary and secondary schools, serving 12,000 students and more than 1,100 teachers. The objective is to enable ubiquitous student access to information tools and foster "technological literacy."

Solution

- Extricom WLAN System, consisting of EXSW-800 / EXSW-2400 WLAN switches and UltraThin Access Points.
- Multiple applications supported on same infrastructure, with performance and quality of service guaranteed through channel blanket topology.

Results

- WLAN quickly and easily deployed.
- Maximized capacity and coverage to support high-density, high-demand environment.
- Minimum infrastructure support costs, thanks to adaptive WLAN architecture and centralized, single point of configuration.
- Voice-ready (VoWLAN) infrastructure.

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up and running," he stated.

The project began with a pilot implementation at the Glynn County Board of Education building. Rupert and his team installed an Extricom EXSW-800 WLAN switch and EXRP-20 access points (APs) to cover the facility, replacing an ad hoc system of consumer wireless products that could not scale to meet the network demands of Board of Education personnel.

The pilot was an immediate success. Prior to the Extricom deployment, Glynn County staff had experienced significant issues with RADIUS server connections dropping as they moved about the building, since the wireless clients repeatedly de-associated and associated with APs. By contrast, Extricom's unique channel blanket topology ensures wireless clients are constantly associated to the switch, and that the right AP is always used to serve each client. The result is seamless mobility and consistent, high-bandwidth connectivity for users. Perhaps the best testament to the new system's effectiveness is that Glynn County Board of Education personnel are barely aware of the actual WLAN infrastructure; they go about their jobs, anywhere, and just know that it works.

The Real Test: Implementing a WLAN in the Classroom Environment

With the pilot completed, the Glynn County IT team began deploying the Extricom system in the highly demanding classroom environment. First up was the Risley Middle School, where two EXSW-2400 WLAN switches and a set of EXRP-20 APs were installed. The radical simplicity of the technology was clear, as the system, covering approximately 14,000 square feet and serving over 500 users, was planned, deployed, and placed into operation in one day.

The IT department worked with a trusted network solutions provider, StormWood, on the implementation. As Nate Griffin, the CEO of StormWood observed, "Everyone involved was impressed by the easy installation and resulting performance." Rolling out the solution took a matter of days, not weeks, and labor-intensive RF cell planning was not needed. Where building design made wireless coverage a challenge, the team simply placed more APs. Such flexibility is unique to the Extricom solution, since AP placement is not limited by channelization or co-channel interference, an inescapable constraint on other wireless solutions.

A Noticeable Difference

The Glynn County team also took advantage of same band operation, an exclusive Extricom

feature that enables two overlapping Wi-Fi channel blankets, in the same band, to be simultaneously active from the same set of APs, thereby creating the effect of a multi-layer WLAN from a single physical infrastructure. The team set up the channel blankets to segregate 802.11g traffic from the slower 802.11b traffic, ensuring total system bandwidth that would be unachievable with any other solution.

System capacity showed the most impressive gains. Glynn County's past attempts at wireless could only deliver enough bandwidth for a maximum of 2-3 users per classroom. A typical class of 30 users would make the network stop working completely. The Extricom WLAN boosted aggregate bandwidth in two ways: (a) by increasing AP density, without co-channel interference, to ensure the highest possible data rate to all users; and (b) by overlapping channel blankets to make the capacity of each channel available in every classroom. In the end, all students received the bandwidth they needed.

Post-Implementation: Managing the Network

An equally important benefit for the overstretched IT team was the WLAN's ease of management. Thanks to a fully centralized architecture, the team needed only to configure a single master switch to place the entire network into operation, while the APs required no configuration or optimization of any kind. In Rupert's matter-of-fact assessment, "It did what it said it would do." Having proven itself, the Extricom system would go on to be deployed in all 17 Glynn County schools, in some cases even replacing newly installed WLAN equipment from other vendors, which was unable to meet the demands of the schools and the IT department.

A Solution for the Long Term

Glynn County will fulfill its objective of ensuring the technological literacy of students at all levels. The Extricom solution provides the school district with the technology, performance, flexibility, and cost-effectiveness needed to ensure these goals are not just met, but exceeded.

Rupert and his team are confident the Extricom systems they have installed will provide the kind of transparent, seamless functionality that is required for the primary and secondary school environment. In Rupert's view, the simplicity and reliability of the Extricom WLAN are the best barometers of its ongoing value. As he succinctly observed, "We had been holding off deploying wireless... basically we were waiting for something like the Extricom system to come on the market."