



Horry County Public Schools

School District's Wi-Fi Goes from Erratic to Reliable with Aerohive

Challenges

- Needed a more robust Wi-Fi solution for highly distributed environment
- Eliminate reliability issues caused by existing controller-based WLAN
- Needed centralized management and easier-to-manage architecture
- Needed to cost-effectively provide Wi-Fi across state's third largest school district

Results

- Controller-less architecture proving highly-redundant and reliable
- HiveManager application dramatically simplified deployment of APs
- Separate VLANs and SSIDs for students/guests, teachers and vendors
- Teachers can access student information system from anywhere on campus

As school districts go, Horry County Schools in South Carolina is quite large and very spread out. Bordered by the Atlantic Ocean on the east and North Carolina to the north, Horry County has a land mass larger than the state of Rhode Island. Meanwhile, its school system – the Horry County Schools – educates more than 38,000 students and is the third largest among South Carolina's 85 school districts.

While Horry County boasted competitive test scores, and other education achievements, it had run into reliability and manageability problems with its existing wireless network. It needed a more robust solution to serve as the Wi-Fi infrastructure for its highly distributed environment.

"Before Aerohive, I was spending 50 percent of my day doing nothing but dealing with wireless-related issues, but since we deployed Aerohive, I am now only spending 5 to 10 percent of my day on wireless. The only time I am really working with the management interface is if I'm updating firmware or if I'm having a problem with an AP – every now and then I have a small problem, but the issue is always resolved in minutes."

—Mike Cherry
Program Specialist-Network Services at Horry County Schools

Challenge

Wi-Fi controllers were at the heart of the problems Horry was experiencing with its previous wireless network, which was comprised of more than fifty locations.

Controllers were collocated among the schools that, in some cases, were sixty miles apart from one another. Access points at one location would be collocated with a controller physically located at another school. APs would jump erratically from one wireless controller to another, causing unreliable connectivity for end users.

Due to Horry's network configuration, devices that didn't have access to the correct subnet would be shut out. This meant, for example, a laptop in school A might errantly get its IP address from school B. That laptop, and end user, would therefore be unable to log in because it wasn't on the right subnet.

"We kept having problems with APs jumping from one wireless controller to another—they were never getting on the right controller," said Mike Cherry, Program Specialist-Network Services at Horry County Schools.

As a result, managing its previous wireless implementation had become time consuming and impractical, says Cherry. "Today was good, next day wasn't—it had become too unreliable."

Solution

Horry began its search for a new wireless network when it was unable to resolve its problems, despite its best efforts working with its wireless vendor.

"We talked with their support team, but they never could really get the problem fixed," said Cherry. "We had a substantial capital investment in our wireless infrastructure, but it got to the point that it cost the district too many man-hours trying to keep the network up and running and configured properly than we thought was necessary."

The district evaluated 802.11n wireless network solutions from several vendors, including Meru, Aruba, Cisco, HP, 3Com and Aerohive. In the end it selected Aerohive for its cost-effective controller-free architecture, ease-of-expansion, high-redundancy, and centralized management.

"We evaluated them all, but Aerohive was the only solution that gave us the controller-less environment we were looking for," said Cherry. "I always tell people about Aerohive – they took the concept of first generation APs and improved on it. Aerohive put the intelligence into those APs and gave us a central way to manage them all, and they also gave us the reliability we required."

Aerohive cooperative control access points ("HiveAPs") provide secure fast roaming, ease of management, and state-of-the-art security without network controllers or overlay networks. Instead, software in the HiveAPs enables them to self-organize into groups called "hives", to share network control information, and to deliver QoS, identity-based policy enforcement and other advanced functionality.

Eliminating controllers from the network substantially reduces the cost of Aerohive solutions. Aerohive's cooperative control networks are also more reliable than controller-based networks, because controllers' "single points of failure" are eliminated.

"I like that if, for whatever reason, an Aerohive AP loses connection with the network, if it still has power, it will back haul off another AP. This means we still have functionality and we thought that was pretty innovative," said Cherry. "With our previous network, when I had a controller go down, everything went down."

Aerohive's architecture and its HiveManager application have dramatically simplified Horry's wireless network deployment.

"Once you get into the HiveManager management interface and set up the APs, there is a step-by-step process that leads you through the process. It's a piece of cake," said Cherry. "On the front end, you might spend a few hours, maybe even a day, getting everything set up how you want it, but from there you just plug in APs."

As for managing his Aerohive network, Cherry has dramatically reduced the time spent on this task.

"Before Aerohive, I was spending 50 percent of my day doing nothing but dealing with wireless-related issues, but since we deployed Aerohive, I am now only spending 5 to 10 percent of my day on wireless," said Cherry. "The only time I am really working with the management interface is if I'm updating firmware or if I'm having a problem with an AP – every now and then I have a small problem, but the issue is always resolved in minutes."

Results

With approximately 1500 APs already installed, Horry is almost halfway through its Aerohive implementation. By year end when the deployment is complete, Horry will have about 3500 APs throughout the district, with an average of about 40-50 APs at each elementary school, and as many as 110 APs in some of the largest high schools.

Moreover, these APs will accommodate Wi-Fi traffic that can be extremely heavy at times. Cherry estimates that there are 20,000 computers in the district, and he predicts that 25 percent of these devices will simultaneously access Wi-Fi. "At any given time, we will easily have 5,000 devices on the network at once," said Cherry.

Aerohive has also been able to address Horry's security requirements. The district has segmented its WLAN into three separate virtual LANs (VLANs) and SSIDs for students and guests, teachers and vendors.

The student/guest SSID implements a captive web portal and provides basic internet access, while the teacher SSID implements machine authentication against a RADIUS server in order to indicate whether a device belongs to the district. As for the vendor SSID, this is set up similarly to the student/guest network but with fewer restrictions.

Adding to SSID security measures, Horry is leveraging the stateful firewall that is included in every HiveAP to secure traffic traveling into, and away from, the wireless network.

As for online initiatives, Horry's Aerohive network is providing the infrastructure for the district's web-based learning efforts. There are currently about three mobile carts in every school totaling around 150, with a pending purchase of an additional 40 carts. Each cart holds between 25-30 Dell laptops as well as a printer.

The school used to place an AP on every cart for Wi-Fi access, but this required teachers to take the time to plug them in. Horry's laptop carts are now able to roam between classes and access Wi-Fi from any campus location, without disrupting teacher's class time.

As far as web-based student information system, Teachers are able to access Horry's Pearson's PowerSchool solution from anywhere on campus. PowerSchool tightly integrates with Aerohive's StudentManager App, which allows school systems such as Horry to provide teachers with the ability to monitor student Wi-Fi activity in classrooms and control what web content students can access during class time.

"This is the reason why we are web based – it makes things much simpler. The teachers can do things like take attendance or enter grades without being restricted to the classroom."

Students, teachers and faculty are also allowed to bring iPhones, iPads and other Wi-Fi-enabled mobile devices from home, although these devices are currently restricted to the guest network.

"Our Aerohive wireless network is making portability possible. People can bring their devices anywhere they want to go in the school," said Cherry. "Where things are headed, in the future we may be able to use less wired connections than we do today."



Contact us today to learn how your organisation can benefit from an Aerohive wireless LAN architecture.

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