

K-12 Education



Douglas County Discovers How to Migrate School District to 802.11n Without Going Broke or Crazy

Douglas County School District (DCSD) had a choice between building wired labs to support state-standardized Measured Achievement Progress (MAP) testing or going all wireless. Given the convenience of wireless and the mobility it affords, Wi-Fi seemed the ideal solution - until they tried it.

Initially DCSD purchased over 80 HP ProCurve 420 802.11g access points just to support MAP testing but soon discovered that the wireless LAN (WLAN) was causing more problems than it was solving. The seven DCSD IT staff was already half-crazed - having to support some 2,500 desktop, laptop computers and services, electronic blackboards, a myriad of switches and routers, wide area broadband links - all while providing end user desktop support. The wireless just needed to work and work reliably.

DCSD's ultimate goal was to deploy stable 802.11n WLANs at each of its schools and centrally configure, manage and troubleshoot each WLAN from a single application and location.

With its existing 802.11g network, DCSD's wireless issues ranged from unstable client connectivity and spotty coverage to erratic performance "Many clients would lose connectivity to the network or see the MAP application fail. Our MAP application is very sensitive to any kind of delay or latency," said Eric Ristine, IT Director at Douglas County Schools District. "The combination of lost packets causing unstable performance and poor signal strength causing the inability to connect was simply becoming intolerable."

Like many school districts, DCSD's facilities are constructed of a variety of unfriendly RF materials such as thick concrete floors and walls that restrict the propagation and penetration of signals. This leads to schools having to spend more money to deploy access points in areas where Wi-Fi services don't reach. It also requires increased capital and operational expense to run more Ethernet drops and power outlets to support the wireless network.

"If you choose the wrong technology, the wireless network can become really big, really fast - with many more devices to install, administer and manage on the network," said David Monachino, wireless LAN engineer at Douglas County School District. "Once the APs are installed, you don't want to touch them. The APs really need to automatically cope, from an RF perspective, with environmental changes so there's no need to constantly re-survey schools or become RF experts. The problem is, we found that conventional Wi-Fi technology didn't have such capabilities."

While the HP ProCurve solution gave DCSD a central view of their wireless LAN network, there was no way to perform universal configuration, event management or proactive troubleshooting. Meanwhile DCSD wanted to use the wireless network for more than merely MAP testing. DCSD needed to provide ubiquitous access to hundreds of concurrent users such as teachers, administrators and guests. More and more, these user were bringing Wi-Fi-enabled Smart Phones onto school campuses and wanted to gain access to the Wi-Fi network. DCSD also wanted to use Wi-Fi to support electronic white boards in classrooms, voice over IP phones in the warehouse and a host of other applications. This would drive throughput demands and capacity requirements well beyond its 802.11g system.



Douglas County School District in Nevada needed a way to easily and cost-effectively migrate to 802.11n for all its 11 schools.

COMPANY OVERVIEW

Douglas County School District (DCSD) serves the communities of Gardnerville, Minden, and South Lake Tahoe, Nevada in the Carson Valley and Lake Tahoe regions. Nestled among the Sierra Nevada Mountains, DCSD operates seven elementary, three middle, and three high schools as well as facilities for maintenance, IT and district offices. DCSD has over 6,400 students and 750 staff. Its IT team of seven manages 2,500 desktop and laptop systems and 400+ district laptops dedicated to Measured Achievement Progress (MAP) testing.

REQUIREMENTS

- Installed stable Wi-Fi network to support student MAP testing
- Migrate from 802.11g to 802.11n across entire district
- Unified indoor/outdoor WLAN with centralized control and administration
- Improve coverage and connectivity
- Simplify deployment
- Support for latency-sensitive applications such as voice over IP, video streaming

SOLUTION

- 65 ZoneFlex 7962 dual-band 802.11n Smart Wi-Fi access points
- 14 ZoneDirector 1000 series Smart WLAN controllers
- FlexMaster remote Wi-Fi service management system

BENEFITS

- Central control of all remote WLANs
- Complete coverage across entire district
- One-half the number of APs required over alternative solutions
- Stable client connectivity
- Simple configuration, deployment and ongoing administration





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"We completely underestimated the power of combining 802.11n and dynamic beamforming. With the range, reliability and performance it delivers, we are now throwing anything and everything on the wireless network"

Eric Ristine

IT Director

Douglas County School District

"As we looked to evolve Wi-Fi within the district, we realized that our existing system wasn't going to be able to supply what we needed with respect to functionality, signal strength, stability and overall quality. So we went looking for an 802.11n WLAN system that would meet these requirements without us having to go broke or crazy," said Monachino.

DCSD began evaluating WLAN systems from Aruba Networks, Meru, Cisco and HP. While these system provided better central management, according to DCSD, the alternatives were overlay complex, riddled with expensive recurring costs and time-consuming to deploy.

"For a single school, an Aruba system was priced at over \$120,000 with recurring costs," said Ristine. "The Ruckus solution was 25% of that, requiring fewer APs and giving us better range and reliability. We completely underestimated the power of combining 802.11n and dynamic beamforming."

DCSD has now standardized on the Ruckus ZoneFlex 802.11n WLAN system across all of its schools and administrative facilities district wide. Only sixty-five ZoneFlex 7962, dual-band 802.11n APs were needed to provide complete coverage across all the district's locations. In places where DCSD doesn't have or can't run Ethernet cabling, such as portable classrooms or fields, APs are being deployed in

mesh-mode – automatically connecting to the network using the 5GHz radio to provide reliable wireless backhaul. Two hidden "global" SSIDs at each site provide secure access for IT staff, administrators and auditors using WPA-2. A site-specific SSID running WPA-2 is also broadcast for MAP testing and general WLAN access.

DCSD is using Ruckus FlexMaster software to manage the entire infrastructure from a single console. FlexMaster not only gives DCSD a view into the entire network but provides universal firmware management, bulk configuration, detailed usage statistics and proactive troubleshooting tools.

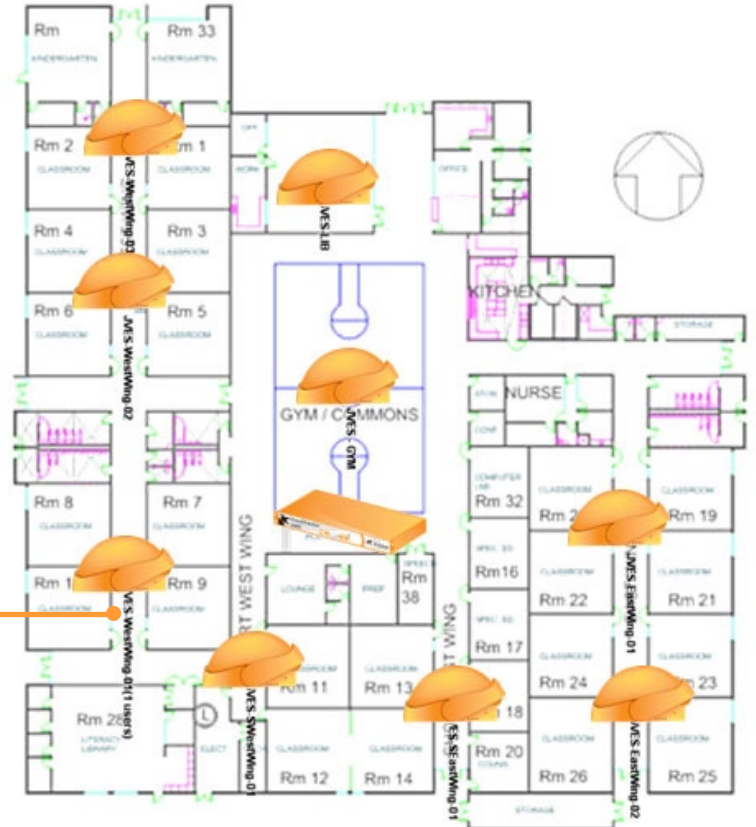
Looking forward, DCSD plans to provide guest access and wants to use the Wi-Fi network to support voice over IP and ultimately IP-based video distribution.

To ensure non-stop operation, DCSD decided to deploy ZoneDirector 1000 controller at each site for local control and management. In the event that the fiber ring failed, each schools WLAN would continue to function.

"We now have a reliable wireless infrastructure in place over which we feel confident in running a host of new applications and services. ZoneFlex was the key in making this even possible," concluded Monachino.



TOP: The Douglas County School District



RIGHT: Jack's Valley Elementary School. One of 11 K-12 schools within the DCSD equipped with Ruckus ZoneFlex 802.11n Smart Wireless LAN technology.

