CASE STUDY

School Districts

Holland Christian Schools
Instructional Technology

Holland Christian Schools Make the Move to 802.11n Smart Wireless LANs

Going through a $27 million renovation and expansion of its facilities, Holland Christian Schools needed a faster and better wireless infrastructure. Holland Christian had deployed over 100 legacy 802.11g Apple Airport access points (APs) for a growing user population equipped with Apple Macintosh laptops or handheld devices.

But as user densities grew and applications became more sophisticated, Holland Christian began to see a number of problems.

Clients were finding it difficult to reliably associate. Connections would be inadvertently lost. While the wireless network was usable, performance was sluggish largely due to 20 to 25 percent packet error rates which caused retransmissions. Self interference from a dense AP deployment was also causing problems. A client would see between 10-15 APs to which it could associate.

Holland Christian Schools needed to deploy a centrally managed and high-speed 802.11n network that was reliable, stable, secure and ubiquitous.

Supporting the 1:1 student computing initiative that provides one laptop for each student, Holland Christian's IT staff must support some 1,500 Wi-Fi enabled devices at any given time.

Moreover, managing the network became increasingly difficult. The Airport APs didn't function as a unified system that could be controlled and optimized from a central point. While Holland Christian could import configs and tweak settings for the APs, the school used MAC-based authentication through a RADIUS backend which required setting individual APs. And no advanced features such as rogue AP detection, at a glance system management and troubleshooting and diagnostic tools made proactive network monitoring impossible. Upgrading and administering the wireless infrastructure became are arduous task for Holland Christian's IT staff, already stretched to the limits having to support a myriad of other non-wireless-related duties. Holland Christian was also unable to provide guest access without providing full network access. This was a problem.

"If I don't have reliable wireless, you might as well cancel school," said Tim Kamps, Director of Technology at Holland Christian Schools. "About 98 percent of devices on campus are Apple MacBook and MacBook Pro laptops which come equipped with 802.11n capabilities. We needed to support these devices with a more stable wireless network that provided better performance." Holland Christian's WLAN requirements included four essential criteria:

1) full-featured Web-based control that could be accessed remotely;
2) reliable wireless meshing to extend Wi-Fi to remote classrooms and facilities that didn't have Ethernet cabling;
3) simplified guest access for visitors and contractors that could be administered by anyone and provides unique and timed passkeys;
4) adaptive signal control that would automatically cope with obstacles and RF interference.

COMPANY OVERVIEW

Founded at the turn of the century and located in Holland, Michigan, Holland Christian Schools is a pre-kindergarten to high school system. Operating six schools within the district, Holland Christian supports more than 2,200 students and staff and over 1,500 wireless devices across a multi-acre campus and facilities that consume more than 560,000 square feet.

REQUIREMENTS

- Full featured Web-based centralized WLAN control
- Fewer APs that could support a high density of users
- Higher speed connectivity with 802.11n to support native 802.11n clients emerging
- Wireless meshing for remote security cameras and portable campus facilities without Ethernet cabling
- Simple but secure guest access
- MAC-based authentication
- Proactive monitoring tools
- Easy administration and management

SOLUTION

- 75 Ruckus ZoneFlex 7942 Smart 802.11n access points
- One ZoneDirector 3250 Smart WLAN controller

BENEFITS

- Three-fold performance increase
- Fewer dropped connections, packet errors
- Centralized control / management of APs
- Network access to areas where no Ethernet cabling existed
- Simplified and robust guest pass access
- Improved user experience
- Adaptable Wi-Fi signals allow reliable coverage

Ruckus™ WIRELESS

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The Ruckus ZoneFlex system was less that have the cost per node of competitive, enterprise-class systems and provided capabilities, such as smart meshing, not supported by other 'industry-leading' solutions."

Tim Kamps

Director of Technology
Holland Christian Schools

Holland Christian operates a Layer 2 fiber backbone that provides school buildings with high-speed Ethernet connectivity. Holland Christian wanted to deploy a single, centralized WLAN controller that could support all the APs in each of the schools without requiring all the Wi-Fi traffic to go through the controller.

So Holland Christian made the decision to move to 802.11n. But to Holland Christian's dismay, most enterprise-level 802.11n systems ran between $1,000 to $1,500 per node. In addition, none of the industry-leading 802.11n systems supported reliable Wi-Fi meshing or were easy to use and deploy. Then Holland Christian found Ruckus ZoneFlex.

Because a high-gain directional antenna array is integrated in each ZoneFlex AP, fewer APs were needed to provide better coverage at higher speeds than the more than 100 they had already deployed.

A checkbox within the ZoneDirector management system enabled Holland Christian to support Wi-Fi meshing without any complicated configuring of APs. If the AP was plugged into an Ethernet cable it knew to act as a root. If no Ethernet cable was attached, the AP automatically began to establish the best connection to an adjacent node using the RF domain.

Ruckus Smart Mesh Network technology is allowing Holland Christian to provide Wi-Fi access to remote and portable facilities where there had been no network access and to support new applications such as deploying security cameras around campus.

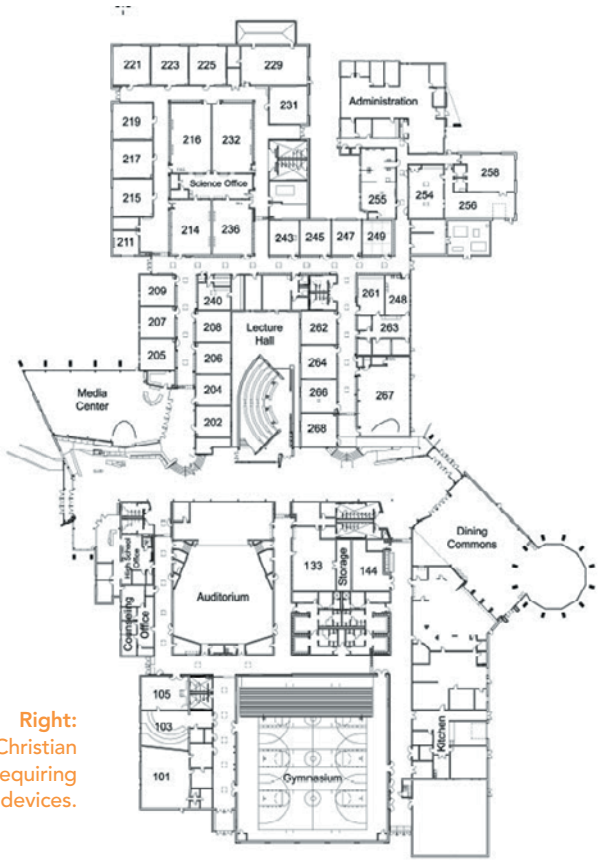
"We didn't have a large budget to purchase a high-end enterprise-level 802.11n system," said Kamps. "The ZoneFlex system was not only cost-effective but provided more capabilities, like smart meshing and adaptive RF routing, that other systems didn't have."

In deploying the new 802.11n WLAN, the distributed forwarding architecture of the ZoneDirector eliminated the problem of having to install controllers in each school. "This was a big win for us as a single ZoneDirector could be centrally located and manage the entire Wi-Fi infrastructure without sitting in the datapath. This not only makes things much simpler but much more optimal from an overall system performance perspective."

To enable guest access, Holland Christian utilized the Guest Pass feature on the ZoneDirector. With the Guest Pass feature, a simple Web-page is used to generate a "timed" guess pass with a unique passphrase.

After implementing the Ruckus ZoneFlex system, Holland Christian has seen a three-fold increase in performance, fewer packet errors, fewer connection problems and better coverage.

"The increase in speed has been great for students and staff. They've also noticed the reliability and we've noticed the ease-of-use. Overall it's a been a noticeable difference all around."



Right:
Covering more than 245,000 square feet, Holland Christian High School was one of six different schools requiring better Wi-Fi to support 1,500 client devices.

Ruckus™ WIRELESS