London's Royal College of Music Makes Wi-Fi Sing with Smart Mesh Networking and 802.11n

At London's prestigious Royal College of Music, providing reliable wireless coverage looked as though it might never happen. Historic buildings constructed in the 1800s of thick concrete and brick were anything but friendly to Wi-Fi signals, while users were looking for more Internet access and reliable connectivity in theaters, practice room and residence halls.

The Royal College of Music (RCM) is home to some 600 world-class musicians and 300 staff who converge daily to create some of the world's most beautiful sounds. Students and staff were bringing in more and more Wi-Fi-enabled laptops and handheld devices and wanted reliable wireless access to make their studies more productive.

RCM had already sprinkled a dozen standalone Enterasys 802.11g access points throughout its main, six-storey facility in Kensington as well as in its four storey residence hall in Hammersmith. However these APs provided limited coverage, slow speeds, flaky connectivity and were a general hassle to manage. And Vista and Mac users, with the newest OS versions in their hands, were simply unable to connect to the wireless network. With the increase in wireless devices at RCM, the situation was only getting worse, quickly.

The Royal College of Music was challenged to find a wireless LAN system that was easy-to-use, affordable and could provide coverage throughout its historic facilities.

"Our existing wireless network was a nightmare to manage," said Kevin Ward, network engineer at the Royal College of Music. "From one moment to the next it was impossible to know who was on the network or to understand the health of the network until it was too late." Ward noted that coverage, ease of deployment and simple, central management were the top three wireless issues RCM wanted to solve.

Due to the configuration of the buildings as well as construction and obstacles within the structures, realizing consistent RF coverage without deploying a large number of APs just wasn't possible. High demands on IT time and tight budgets mandated a simple but robust system that could deliver centralized management and reliable connectivity but at an affordable price point.

With standalone APs, RCM had no way to optimize RF performance with out tedious manipulation of each AP. Additionally the APs didn't function as a coordinated system which made it more difficult for RCM to troubleshoot problems and manage the wireless infrastructure.

Consequently, RCM wanted to standardize on a centrally-managed, mixed 802.11g and 802.11n wireless LAN system that could deliver reliable connectivity and higher speed performance. RCM wanted to deploy a centralized WLAN controller in its main facility in the centre of London to manage both local APs in its Kensington facility as well as remote APs installed in the residence hall. In the residence hall, the WLAN needed to provide complete coverage to all 150 rooms. More important, the WLAN needed to be straightforward to configure, deploy and manage.

"We initially brought in seven vendors including Aerohive, Aruba, Cisco, Meru, Xirrus, Saxnet and Ruckus Wireless to provide their best kit but quickly found dramatic differences in every solution," said Ward. "Some systems just didn't have the range while others were complex and overkill for us. There were also solutions that charged for features, such as wireless meshing, that we thought should be a standard part of the base feature set. This was clearly a tall order to fill, and we were getting quite frustrated not being able to find the right solution with the right mix of features, performance, coverage and cost."

COMPANY OVERVIEW

Founded in 1882, the Royal College of Music enjoys a reputation as one of the world's leading conservatories, providing specialized musical education and professional training for performers, conductors and composers. With several facilities located in the centre of London, the Royal College of Music supports over 600 students and employs a staff of more than 300.

REQUIREMENTS

- Reliable Wi-Fi coverage with a minimal number of access points
- Stable user connectivity
- Extension of WLAN without Ethernet cabling
- Simplified and centralized management
- Fast, easy installation and configuration
- Native support for Active Directory without RADIUS
- Dynamic RF management support
- WLAN management of APs over a high-speed wide area network

SOLUTION

- Ruckus ZoneDirector 1050
- 19 Ruckus ZoneFlex 2942 802.11g APs
- 6 Ruckus ZoneFlex 7942 802.11n APs
- Smart Mesh Networking support

BENEFITS

- Reliable Wi-Fi access
- One-half the number of APs that would have been required by any comparable Wi-Fi system
- Differentiated user access
- Simple administration of guest passes
- Automatic wireless configuration of security on user laptops
- Seamless roaming between APs
- Automatic interference avoidance

After exhaustive testing of competitive WLAN systems, RCM standardized on the Ruckus ZoneFlex solution, deploying ZoneFlex 2942 802.11g APs and a centralized ZoneDirector Smart WLAN controller its Kensington facility.

At the residence hall, RCM installed a mix of 802.11n and 802.11g APs, using the same controller in Kensington to manage these APs over a high-speed fibre backbone. A distributed processing architecture allows IT administrators to deploy Ruckus ZoneDirectors out of the data path and anywhere within a layer 3 IP network.

ADA supplied the Royal College of Music with kit for RCM to perform a proof of concept as well as consultation on best practices for a wireless environment.

Once Ruckus Wireless was chosen as the technology, ADA performed a light site survey to determine signal strength and the coverage of Ruckus APs. After the initial site survey, subsequent site surveys were not required due to the ability for Ruckus Smart Wi-Fi APs to continually perform best path selection for Wi-Fi signals to every associated client.

With the ZoneFlex system, RCM was now able to manage and control both meshed APs and wired APs (802.11g and 802.11n) on a single Web-based management console.

"We were impressed by the price/performance ratio of the Ruckus ZoneFlex kit given the complete coverage we've seen," said Ward. "Our hotspot coverage within the facilities have improved significantly."

RCM leveraged the smart mesh networking capability, a standard feature with the ZoneDirector system, to install ZoneFlex APs where it was most convenient, eliminating the requirement to pull additional CAT-5 cable.

Smart mesh networking simplifies deployment and speeds installation. A check box on the ZoneDirector enables smart meshing for the entire WLAN. No individual AP configuration or complex planning is needed.

If an AP isn't attached to an Ethernet cable, it assumes mesh mode and uses the RF to establish a connection to the nearest AP over the highest performing path. A smart antenna system in each AP ensures reliable backbone connections, automatically steering signals around interference and obstacles.

"If we need coverage in a given area, we simply take an AP, plug it into a power socket and walk away, the system does the rest. ZoneFlex effectively takes the guesswork out of configuration, local RF management and resiliency. This was truly unique and a huge timesaver," commented Ward.

User authentication is performed using Active Directory natively without the need for RADIUS. Going forward, RCM plans to move to dynamic VLANs where users, based on their authentication, gain automatic membership to a specific VLAN despite the SSID with which they associate.

"Overall, we've experienced fairly consistent performance at range using the Ruckus kit," said Ward. "Wireless reliability and range were two primary issues we've now solved."

RIGHT:
The first floor of the halls of residence at the Royal College of Music. A mix of six meshed and wired Smart Wi-Fi APs provide reliable connectivity to students.