A MERU CASE STUDY IN EDUCATION

Heathland School

Challenge

- Deliver a new wireless network to support high density coverage and high capacity demand (2,000 + users).
- Supply a secure system with ease of deployment and maintenance, combined with reliable scalability as needs grow.
- Ensure full coverage of the school, including planned extensions and avoid conflicts from neighbouring networks.

Solution

- 37 Meru AP201 APs with Meru Wireless LAN MC3050 50-port controller.
- Meru's Virtual Cell (single-channel) Architecture for ease of deployment, expansion and scalability.
- Meru's Air Traffic Control technology for higher air quality of service.
- On-site training by Meru's distribution partner, 802 Global.

Benefits

- Access to multimedia content.
- Complete wireless network coverage throughout the school.
- Higher teaching and learning experience.
- Cost savings and added productivity.

Conclusion

- Performance requirements were addressed through Meru's ability to support a high density of coverage for the school's growing user base, without compromising on quality and security.

Meru Networks makes the wireless grade with deployment at Heathland School

The Meru Networks solution gave 2,000 + users the required access to the network.

During the summer of 2007, Heathland purchased 150 laptops for student use. Once the network is fully deployed all wireless users at Heathland will experience complete coverage throughout the school, and across its playing fields.

Background

Since 1973, The Heathland Comprehensive School in Hounslow, West London, has provided education for girls and boys ages 11 to 18. It is one of the largest such institutions in the Greater London area.

Today the school is home to 1,850 full-time students, 150 teachers and 200 support staff. The school's curriculum utilises both traditional teaching methods as well as forward-thinking ones in order to the enhance students' education and to prepare them for 21st century work-force practices. This balance has yielded dividends for the Heathland school with its students achieving above-average marks in UK standardised tests (GCSE's and A-levels).

An important building block of Heathland's methodology is an advanced use of technology within the school. Not surprising, the Internet has become an increasingly powerful learning tool, which is prominent in the day-to-day lives of its students in areas such as communication and for classroom research.

Classroom modernisation initiatives such as providing students with laptops are putting greater demands on school Wi-Fi networks, but building a wireless network that effectively supports 21st century learning initiatives can be challenging. No longer is it enough that Wi-Fi supports basic access to e-mail and the Internet – students and teachers want more from their school's wireless network. They demand instant network access in crowded classrooms, the capacity to support multimedia content, as well as reliable connectivity for mission-critical real-time communications.

Leading the trend toward the all-wireless campus, Meru Networks is the only Wireless LAN vendor addressing all the unique challenges of deploying a high-performance and cost-effective wireless infrastructure at educational institutions of all sizes and needs. With a unique architecture that enables the most pervasive deployments, Meru's WLAN System has been adopted by numerous higher education institutions to bring innovation, cost savings, and added productivity to their environments.

The Problem

To keep pace with the proliferation of portable devices like laptops and multimedia devices that would connect to the Internet wirelessly, Heathland School had early on invested in off-the shelf wireless equipment from a high-street shop. The makeshift system was not upgradeable and although it did provide some basic connectivity, at its best, it could serve only a few dozen users at a time. Those benefiting from connectivity were mostly the teaching staff and not the nearly two thousand students who the system was also intended for.

The school's Network Manager, Adam Urch, was involved in the decision making and deployment of the existing equipment. The school wanted to invest in a much better system, and despite the emphasis towards creating a wireless network, Adam initially advised against doing so. His reason was because of problems he knew existed in the wireless industry, such as speed and capacity during log-on times and Adam predicted that a wireless system would not be able to cope with the demand – especially in an environment where at least 300 users will be logging onto the system at the same time.

Adding to capacity problems the existing wireless network was also experiencing performance problems caused by interference from a high density of private networks in the surrounding urban area.

Furthermore, the School had already planned building expansion and if Adam and his team were to deploy with a new wireless system to cover the entire school, any new buildings would create a new set of channel-planning related issues, as the team would be back to square one to re-plan and re-map the wireless network to ensure coverage is achieved throughout the campus, while incorporating the already-installed equipment. This option would substantially add to manpower and deployment costs.

All these factors confirmed the need for a wireless system fit for the school's purposes; one which had the ability to deal with the capacity demands, a system that would avoid conflicts from neighbouring networks, one that would avoid problems in channel planning and would be reliable enough to scale as the school's needs grew.

Adam explained, "We were looking for a system which had easy maintenance, upgrading and good centralised management so that we could tell from the location-manager exactly what was going on with the network when there were problems. Network security is also a high priority for obvious reasons."

The Solution

After evaluating a range of industry solutions, Heathland chose to install a system from Meru Networks. Key to the decision was the ease of deployment found in Meru's unique single-channel Virtual Cell Architecture. Meru's Virtual Cell feature, incorporated into its hardware,

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enables all Meru Access Points (APs) to be deployed on a single channel, eliminating co-channel interference, and reducing the costs associated with site surveys and RF channel planning.

Legacy WLAN systems cannot handle co-channel interference or successfully operate APs on the same channel, and therefore require that APs are placed on alternating channels when deploying a pervasive WLAN. What this does is force a single area to only be served by a single channel at any one time. If there are only three possible channels the network is trading off 66% of its potential capacity in an attempt to avoid the co-channel interference problem.

In contrast, Meru's Virtual Cells can be deployed simultaneously on multiple channels in the same area, creating the most scalable WLAN on the market through overlaying blankets of capacity.

Meru's Virtual Cell attribute would also reduce expansion-related costs as there would be no need to revisit existing equipment for channel planning – a significant saving to Heathland's maintenance budget.

Performance was the other critical factor in Heathland's decision to choose Meru. Interference from overlapping AP channels and co-channel interference raises the level of noise, which reduces performance of the network. Meru avoids this problem by managing the APs in the system with cellular-like coordination algorithms that account for co-channel interference and mitigate its effects. This cellular network architecture coordinates contention across cells as well eliminating hidden node issues. Meru's ability to support the school's high density of coverage for its 2,000 + users would make a big difference to the students' experience, enabling them to access the Internet as part of classroom exercises, which they were unable to do under the previous system.

The old system was pulled out and 37 Meru AP201 APs were initially installed. A key component of the Meru Wireless LAN System, Meru Access Points deliver unsurpassed Wi-Fi performance in conjunction with Meru Wireless LAN Controllers. Representing a shift to fourth generation WLAN architecture using intelligent APs, Meru delivers the only Wi-Fi certified infrastructure that handles toll-quality wireless VoIP and high-capacity data on a single infrastructure with no compromises. The AP201 performs best in mixed 802.11b/g environments and offers incomparable support for high-density user environments. This AP further has exceptional wireless VOIP performance using Meru's Air Traffic Control technology.

Installed alongside the APs was the Meru's MC3050 50-port controller. All Meru controllers include a common software foundation, System Director, which offers a set of standards-based and extensible services for ease of RF deployment, comprehensive security, over the air quality of service with zero-loss handoff mobility for converged data, voice, and video networks using unique Air Traffic Control technology. The MC3050 is ideal for midsize to large-scale enterprises and is software upgradeable, which means up to 150 APs could be in total configured.

Training for Adam's team was conducted on-site by Meru distribution partner, 802 Global.

The Benefits

Currently, the Meru network covers the three floors within Heathland's main building, as well as all its classrooms. Furthermore, it covers all the outside buildings and a new extension.

The school is already benefiting from its Meru Network's installation. Departments without cabling are now able to teach online content and take advantage of programmes that the school is investing in, ultimately contributing to improving the students' experience and personal performance.

Previously teachers that required their students to have Internet access for lessons needed to move from room to room to locate one where a cabled access was available. Today, these same teachers have the flexibility to move around the school to coordinate lessons wherever they would like rather than being constrained to classrooms with wired access.

The Meru solution is also being used to provide Information Technology as a subject to Heathland students. Now, any classroom can be turned into a computer lab.

Conclusion

Heathland's desire to be a technically savvy and forward thinking institution for both its students and teachers was being challenged by a wireless network that was not fit for the unique needs of the school.

The Heathland School required a system that could be easily deployed and easily expanded upon without compromising on security. More importantly it had to cope with the 2,000 + users that would, over time, require access to the network.

The school chose Meru Networks for the ease of deployment and expansion found in its unique Virtual Cell (single-channel) Architecture. Performance requirements were also addressed through Meru's ability to support a high density of coverage for the school's growing user base.

Adam commented, "I've always said that a wireless network will not be as fast as a wired connection. Teachers realise this, but they are still happy with the speed of the (Meru) connection. Our goal was to have students logged on within five minutes – with Meru, so far, so good."

About Meru

Meru Networks is the global leader in wireless infrastructure solutions that enable the All-Wireless Enterprise. Its industry leading innovations deliver pervasive, wireless service fidelity for business-critical applications to major Fortune 500 enterprises, universities, healthcare organizations and state, local and federal government agencies. Meru's award winning Air Traffic Control™ technology brings the benefits of the cellular world to the wireless LAN environment. The Meru Wireless LAN System is the only solution on the market that delivers predictable bandwidth and over-the-air Quality of Service with the reliability, scalability and security necessary for converged voice and data services over a single WLAN infrastructure.

Founded in 2002, Meru is based in Sunnyvale, California.

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