

# MERU GOES BACK TO SCHOOL

Blackfen School for Girls



## School's out for wired networks as Blackfen School for Girls chooses Meru's wireless technology

### Get on the internet immediately, anywhere on the campus.

*Blackfen School for Girls, in Sidcup, Kent, is a fast-expanding school with more than 1200 pupils, including a thriving mixed sixth form. It has more than 200 full time staff. All those staff and pupils can open a laptop and get on the Internet immediately, anywhere on the campus, thanks to a Meru wireless LAN, which has exceeded the expectations of the school's IT manager, Shaun Neighbour: "It's made a big difference - teachers can use online resources in the lessons, without having to cart the kids down to an IT suite."*

#### ❖ Challenge

- Blackfen School needed a wireless network that would allow classrooms of students to reliably and securely access the Internet and other networked applications. The school also wanted to avoid supporting a separate network for cordless phones.

#### ❖ Solution

- 50 Meru AP201 access points deployed in a single channel Virtual Cell, plus two MC3050 controllers, provided by specialist distributor Siracom

#### ❖ Benefits

- The Meru solution outclassed the competitive alternative on performance, flexibility and cost
- A class of pupils can be issued with laptops and logged in within five minutes
- Meru Virtual Cell architecture dramatically simplified deployment and management
- Multiple SSIDs make admin tasks easier for different user groups and device types such as handsets and printers
- Single wireless infrastructure simultaneously supports data and seamless voice services

Blackfen has undergone a revolution, taking it beyond the old model of desktop computers in an IT suite, to a new world where technology is universally available, wherever it may be needed. To meet those needs, Neighbour first developed an enviable expertise in planning complex wireless networks - and then found that specialist integrator Siracom offered a radical solution from Meru that sidesteps wireless LAN limitations and makes RF channel planning unnecessary.

#### The requirement: IT access everywhere

Demand for technology in schools has increased, as all pupils routinely used computers in most of their subjects. It is no longer possible for every class to troop into a specially-furnished IT suite whenever it needs PCs or the Internet.

"Blackfen School became a Maths and Computing College in September 2004 and straight away the senior leadership team and I realised that we needed to give our students and teachers more access to ICT as a tool outside of ICT and business studies lessons," says Andy McGee, assistant headteacher (maths and computing).

Blackfen School has steadily invested in laptops for its pupils. The School currently has 140, which are stored in specialised "LapSafes" that can be wheeled into any room to create an on-demand computer lab. Each member of staff also has their own laptop, which they use for jobs such as taking the register.

In 2003, Blackfen started using Wi-Fi; in the years since, its network grew and suffered all the problems of traditional wireless LAN technology, including:

- interference between access points,
- capacity limitations,
- complex RF planning, and
- a need for continuous troubleshooting.

#### The challenge: radio channel planning and management

"We started with two or three access points that roamed around [with the LapSafes]," says Neighbour. The £40 standalone devices, from D-Link, were taped to the top of the LapSafes, so when they reached the classroom they could be plugged

in to provide a connection to the school network. It was a good solution in theory, but in 2003, laptops were slow, and so were access points, which then used the 802.11b standard: "With one 802.11b access point shared by twenty students, it took ten to fifteen minutes for pupils to log in. In a one hour lesson, that is not acceptable."

To improve on that, Neighbour gradually expanded the network until fifty access points covered the whole school. But that didn't solve things: the network started to experience "co-channel interference", where signals from neighbouring access points overlap.

Wi-Fi has a limited range of radio spectrum. There are thirteen possible Wi-Fi "channels", but they overlap, so access points in neighbouring rooms can't use adjacent channels without causing interference. There are only three channels guaranteed not to overlap, so most large Wi-Fi networks have to be carefully planned to distribute those channels across the floor plan of a building, adjusting the power and range of each access point to avoid interference.

"It was quite interesting trying to organise which access point was on which channel - but once it went 3D and we had three-story buildings, channel planning was quite a puzzle," says Neighbour. He worked out the radio plan by hand, using massive colour-coded maps. He found three channels were not enough, so he researched: "I found a nice case study written by a US University that found you can just get away with five."

As if that complexity weren't enough, Blackfen had a new building which turned out to have wire mesh in the walls. This played havoc with wireless transmission, so in that building every classroom needed a separate access point.

Apart from the effort of design, the wireless network needed constant firefighting. The access points, set up so carefully, would reset themselves to factory settings, and interfere with each other, as well as turning off their encryption making the network insecure. "Resetting access points was a daily task," says Neighbour. "Half the wireless LAN decided to switch off encryption during one holiday."



*"We set it up in the difficult building, the one with wire mesh in the walls. We got away with two APs for the entire floor." "There was no cut off, even when we ran around streaming DVDs from a server," says Neighbour. "It all worked brilliantly."*

## ■ 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, health-care 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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By 2005 a range of solutions were available which automated the interference problem, using a central switch to control and manage the channel plan. Blackfen's wired network used Hewlett-Packard switches, but HP's solution at the time wasn't suitable. A school nearby had invested in a Wi-Fi switch from competitive, says Neighbour: "It looked like the next step."

On paper the competitive solution looked a good one. It increased coverage, gave more capacity by upgrading to the newer 802.11g standard, and centralised the security, management and channel planning tasks. The school had demonstrations from various competitive resellers, and the technology seemed to work.

The downside was the price. It cost £50,000 - but what alternative was there? "It looked like a case of trying to find the budget, and justifying it," says Neighbour.

### The solution: no more channel planning

At that point, Neighbour made contact with Siracom, an integrator specialising in converged networks. Siracom told him the Meru wireless LAN does away with the channel planning altogether. Instead of struggling to avoid overlaps, Meru's unique architecture puts all the access points on the same channel, and employs patented technology to deliver high performance and quality of service.

"It turned everything we previously thought we knew about Wi-Fi on its head," says Neighbour. To convince him, Siracom lent Blackfen a switch and four access points.

"We set it up in the difficult building, the one with wire mesh in the walls," he says. "We plugged all four APs in, but we found we could get away with two for the entire floor." As well as giving good coverage, the LAN did things other networks couldn't, switching connections instantly between access points. "There was no cut off, even when we ran around streaming DVDs from a server," says Neighbour. "It all worked brilliantly."

### The benefits: fast access, easy expansion

Without the need to plan radio channels, installation was dramatically simplified with the Meru WLAN. Meru access points simply replaced the D-Link devices, and were powered over the Ethernet using power injectors.

The laptops can now log in as quickly as desktops connected to Ethernet, says Neighbour. "The laptops have never been used so much - they are

a real viable alternative to carting the kids down to an IT suite. Staff know that five minutes after giving the laptops out the pupils are logged in and ready to go.

The Meru network appears to be "one access point", says McGee: "There are no conflicts for the laptops if they are in range of more than one access point. This has led to a much more efficient wireless network and we have further expanded our LapSafe provision around school."

"Students now have much more access to ICT in many of their lessons," says McGee, adding that the network has helped the school participate in the London Managed Learning Environment (MLE), a government-backed online learning initiative. "Students are able to access their work online during lessons," he says. "For example in AS French, students regularly access work in the MLE that supports their comprehension and oral work by giving them video and audio files in genuine French to work from."

The system has also supported Neighbour by simplifying admin. It has allowed him to set up separate wireless LANs on the same access point network, each with a different identifier (SSID) so staff and pupils can have their traffic kept separated, and voice devices and printers have networks tailored for their own characteristics.

Overall, the Meru solution is more cost-effective than the competitive alternative, so the school has been able to go ahead with 50 access points, and increase its coverage to provide a wireless LAN for the primary school that shares its site - with a separate SSID, of course. Unlike the competitive offering, the Meru network also included a second back-up wireless switch for redundancy.

Running voice on the Meru network could also save the school up to £25,000, which would have been the cost to extend the school's PBX exchange, with a set of proprietary wireless phones. Instead of taking that route, Neighbour had the PBX connected to an open-source voice exchange and now uses Wi-Fi phones on the Meru network.

"We can manage our own phone system now," Says Neighbour. At present the IT department has a dozen Wi-Fi phones, and other staff will be able to use dual-mode mobile phones, that use the Wi-Fi when at school.