New College Swindon have taken advantage of a new build project to implement a complete wireless connectivity solution throughout the college, including their new building. This has resulted in direct cost and time efficiency savings and enabled policy change to enhance access to the college network and resources for both staff and students.

The wireless infrastructure has increased the flexibility of the building and benefited the administration of course delivery. This has also enhanced room bookings and group activities. The wireless network service is proving a reliable and first choice usable system, building confidence in electronic content delivery.

New College opened in September 1984 as a Sixth-Form College and quickly expanded its range to include highly successful Access to Higher Education and Degree courses, while also setting up its business services arm, Fast Forward, which has provided quality training for companies in Swindon for ten years. New College Swindon is now the premier academic provider of A Levels and GCSE in the wider Swindon area, enrolling approximately 3,000 full-time students as well as 10,000 part-time students.

The college ranks as one of the best further education institutions in the country, with success rates within the top 10%.

The existing wireless network in the college was failing to meet the demand and was unable to provide sufficient coverage due to a lack of access points (AP) and bandwidth across the campus. Therefore it was limited to providing connections to college owned and domain registered computers.

Regulating the number of users and the services provided was part of the protection mechanism to ensure that wireless delivery was acceptable. Those services requiring a high bandwidth, such as rich internet applications and those relying on video and audio content were particularly restricting.

The college also wanted to be able to increase the flexibility of the teaching space and provision of wireless services, particularly within their new flagship build project. Therefore
a big challenge was to come up with a solution that would be able to cope with and promote use of their wireless service, especially considering the popularity of mobile smart phone devices amongst most students.

Fixed and portable IT equipment was available to support the teaching and learning requirements. Enabling greater utilisation of this investment was identified as a project driver, along with reducing the reliance upon provided equipment. Other system developments such as enabling remote login, would also allow privately owned equipment to be bought on site and used.

It was decided that providing a wireless solution that covered the site, that took advantage of the newer wireless communication standards and came from a single vendor to minimise the management overhead was required.

The activity

New College Swindon ICT Manager Phil Quinn reviewed the wireless solutions on offer from the leading vendors. Phil routinely attends the Jisc RSC South West Technical Forums, at which he learnt that Yeovil College had already deployed a new wireless network in their Learning Resource Centre and they recommended Xirrus.

Xirrus presented a better technical solution than the other vendors. The devices contained multiple radios (4, 8, 16 or 24) and supported all of the current wireless standards. The advantages of those features are:

- 802.11a,b,g and n, a and n provide support for newer devices, smartphones, tablets
- Higher frequency, less interference from other devices such as security sensors, microwaves devices, with greater bandwidth (5GHz rather than 2.5GHz)
- More broadcast channels available, therefore less interference with private wireless devices in homes around the campus. This allows for a greater deployment density, which means more users can connect and receive the services they expect at the expected service speed.

Xirrus provided NCS with a loan of the wireless equipment to try out in a major learning area in the college. This was deployed unannounced and neither the staff nor students noticed any difference in the way they connected. This included desktop PCs, via Cisco Wireless cards, as well as mobile devices.
The wireless card installed into one of the PCs

The loan of equipment was supported by a free full site wireless survey based on the deployment of Xirrus equipment; additionally a survey of the proposed new building was done from the blueprints. The survey and subsequent quotation was then guaranteed by Xirrus to meet the requirement. Any shortfall in service would be met by Xirrus deploying additional APs at their expense.

NCS bought the Xirrus equipment as a full site deployment, including for the new build which was still ‘unbroken ground’ at this stage. They deployed the equipment and a ‘soft launch’ to users was initiated.

The college now control access by authenticating its users by a username and password against the College systems.

The outcomes

A major benefit of the wireless deployment is that it can increase the bandwidth and types of content data, such as audio and video. The multiple radios provide overlapping coverage and can be set to only accept a given number of connections ensuring service quality, passing additional connections onto under-utilised radios. The built in controller function routes data more efficiently, sparing the wired network. Older devices connecting, do so to a radio set to their connection speed, and don’t reduce the speed to users with newer devices.
One of the access points used in the new build

By enabling the wireless access across the college it has really streamlined not only delivery of services but enhanced mobile connectivity. The main benefits of this are:

- More freedom and versatility with services.
- PCs and laptops can be moved anywhere in the college and connect, the limitation is a plug socket and not a network cable socket.
- Students bring in their own equipment and resources more often now, reducing pressure on finite college facilities.
- The reporting tools allow monitoring of usage and allow future improvements and changes to methods for IT service delivery to be made.
- Staff with laptops, move around the college more often to work in ad-hoc groups with peers and students having access to all their resource.
- Students have access to the Live@Edu service for their email, additionally many have Google docs accounts, connecting via wireless gives these student greater mobility in working, accessing on-line resources that are required.

"I must stress how good it is to be able to take a PC and move it wherever I want to" - Phil Quinn - ICT Manager
The brand new college Annexe, which is an extension of the existing college building, has not only increased capacity by 35%, but is also completely wireless. This new development, will not only increase student numbers at the college, but significantly enhance access, providing state-of-the-art services. The new Annexe is also host to Student Services, who help with information, advice and guidance.

**The impact**

The number of users accessing the college wireless services has increased dramatically since the new build and wireless deployment as Phil sums up:

“I've monitored usage across the 49 arrays that we've got going across the site - bandwidth monitoring - a lot more people accessing than expected - 1,800 unique accesses each day, wireless connected. Bandwidth currently does not go over 70MB a second over all of them.”

A good example of the efficiency of the new wireless system is the colleges learning centre, which has some 70 PC’s for students and staff PC’s all wirelessly connected. The PC’s all have duel antenna Cisco wireless cards, connecting all devices to one 8 radio AP. The system handles mass activities, such as multiple logins at opening time, without complaint from the network or users. Even computer gaming students are able to play online web-based games as part of their research activities without issues.
In total the college has around 400-600 users accessing the wireless services at any point in time and of these there are around 200-400 mobile devices connected.

“I’m proud of what we have been able to achieve here, by building a completely wireless system” - Phil Quinn - ICT Manager

“We have a flexible, new, nice-looking environment that works, anyone can come in and use it. I have no qualms about saying ‘come in and use our resources’ as they will work” - Phil Quinn - ICT Manager

**The lessons learned**

There were enablers for success and many lessons learnt during the process, which were:

- Identifying a capable supplier that could provide the results needed.
- Building confidence with wireless technology and convincing staff it was a valid solution.
- Crucial support from the Jisc RSC SW technical forum to gain real-life experiences from other LPs who had already implemented wireless systems.
- The use of JiscMail lists to find out information.
- Cutting the need for extensive cabling and network switches throughout the new building, helped reduce costs - key for the deployment of the technology.
- Understanding the differences in privately owned laptop devices and the restrictions of network cards and finding a solution to potential connectivity issues.
Phil gives his advice and guidance for providers that are interested in moving to a wireless system:

“Keep an eye on future developments, you’ve got to look at the demand that the growth on the wireless side is going to have on your network”

“As mobility becomes more embedded into staff and student practice, there may well be many more requests to consider”

“Don’t underestimate it, it’s a difficult thing to do because you might not know exactly what the demand will be, but plan ahead, give yourself more time”

Whilst it’s good that students can use their own devices, it’s dangerous to assume that equity of access is available to all students, Phil is cautious in that:

“If you have a laptop trolley for 10, make it 20 instead so that you can cover extended use and access” he caveats that with additional advice

“Make sure you invest in decent kit and do it properly”

“The other thing is to keep an eye on new mobile technology that the students are bringing into the college as it is a rapidly advancing area, which you need to be aware of”

“There is also a change culture going on that whereas before students went from wondering if they could bring in their own devices to now expecting to be able to use them in the college”

Useful links

- New College Swindon
- Jisc RSC South West
- Jisc Techdis technology matters
- Jisc Netskills workshops
- Xirrus

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