Shrewsbury College of Art and Technology – Improved network infrastructure facilitates bring your own device (BYOD)

Summary
Thanks to a significantly improved IT infrastructure, staff and students at Shrewsbury College of Arts and Technology have access to a more robust and reliable network. This has facilitated a more open policy allowing staff and students to make use of their own mobile devices. Productivity has increased, time is saved for the IT technicians on repairs, and network downtime has been significantly reduced.

About Shrewsbury College
Shrewsbury College of Arts and Technology is one of the largest colleges of Further Education within Shropshire, serving a catchment area which includes the whole of Shropshire and parts of Hereford, Worcester, Powys and the fringes of South Staffordshire. The College is located on two sites in Shrewsbury and has a construction centre in Telford.

The College has recently introduced a programme of A Levels that can be studied alongside a main vocational qualification – these will commence in September 2013. The College has approx. 6,000 student enrolments on vocational and general education courses, of which over 1,600 are full time with the remainder on released and non-released part time programmes.

The challenge
Shrewsbury College put in a joint bid with the local sixth form college for a new campus for both learning providers but due to funding constraints on capital building projects at the time, the new build did not happen.

Robin Breakwell, Technical and Information Services Manager says, “We had underinvested in the network for many years as we had planned for a new build. As a result, we simply added to the existing infrastructure. The staff and student networks were separate, there were many single points of failure and the telephone system was getting very old and unreliable. We had a wireless network which provided coverage but limited bandwidth, so if two or three users were in an area at the same time, the network became unusable as we didn’t have the bandwidth capacity to
handle it. We couldn’t make use of portable teaching facilities such as laptop trolleys which could have given us much more flexibility in non-IT classrooms.”

The activity
Shrewsbury College invested a significant amount of money and started from scratch with a new infrastructure. A plan had been formulated for the new building so Robin and his team worked on the same type of infrastructure but on a smaller scale.

The new infrastructure was installed in 2010 by Vodafone using Extreme Networks hardware. Robin’s team oversaw as much of the installation as possible so that they could continue to manage and support the network on a daily basis.

The project involved a core (centre of the network) to edge (end-user) switch infrastructure, with 20gbps fibre connections to all IT classrooms and a VOIP Avaya telephony system.

The new infrastructure worked really well for college owned PCs and laptops, however Robin and the team wanted external guests to be able to access the network using their own devices. The creation of several Virtual Local Area Networks (VLANs) meant that the team could slice up the network to maintain security and keep the traffic separate for staff, students and guests as follows:

- Staff wireless network – allows staff to access all internal systems and network resources including the internet, network storage and systems on college issued laptops. Same user experience as from a wired desktop.
- Student wireless network – as per above but for student users
- Staff Guest – allows staff to access the internet and limited network resources on their own laptop
- Student Guest – as per above but for student users
- External Guest – allows external guests, visitors, staff and students to access the internet and external resources such as Moodle using their own devices (laptops, tablets and mobiles). There is no access to internal systems.

The outcomes
Initially, the External Guest VLAN was set up purely for guests and visitors to access the internet whilst at the college. This was done typically using their own laptop.

Robin says, “The concept of Bring Your Own Device (BYOD) is allowing staff, students and guests to access the network using a personally owned device. In 2010, when we set up the network, a BYOD device was typically a Windows device. However, since then, technologies and user requirements have moved on significantly with the introduction of tablets and smartphones. We had to react to that and so the External Guest VLAN became the means for staff and students to access the internet using their own tablet and mobile devices.

Robin adds, “Our BYOD solution was homegrown and we made use of the existing network infrastructure without having to buy additional equipment. We handle authentication and security in an alternative way, instead of a more traditional Network Access Control (NAC) solution as this was too costly. The use of wireless and VLANS has allowed us to control this really effectively. Depending on what
devices staff, students or external guests are using (their own device or college device), they obtain a wireless password key in different ways

“The wireless access keys are changed regularly throughout the academic year. For staff, they can access the help information and site page via SharePoint to obtain the current wireless key. Learners can access the information and access key via Moodle, and external guests can obtain the current key from reception.”

**The impact**

The investment in the network has had a significant impact on Shrewsbury College:

- **Real-time support** – using network management tools the technicians can see issues on the network at a glance and often fix problems before the user has noticed
- **Time saved** – IT team can fix problems on the spot and no longer have to waste time travelling to other campuses
- **Reliability** - network outage is no longer an issue
- **Increased productivity** – with increased usage of mobile and tablet devices, staff and students are using useful productivity apps such as DropBox and Evernote to record notes and meeting minutes, and access files more quickly and easily which also saves time
- **Culture change** – the new infrastructure has led to the college opening up the use of social media. This could not have happened with the previous infrastructure. Robin says, “We used to lock everything down but our message now is ‘educate not legislate. It has enabled us to educate students about the dangers of social media but given them the freedom that they expect without compromising the network.’”

He adds, “Giving students the scope to bring in their own devices has meant more flexibility for teaching and learning.”

Robin adds, “Usually, organisations have to play catch up in terms of bandwidth but we will probably never reach this stage. It is no longer a concern if we need to expand as we have future proofed with the amount that we have. We now have a very reliable and resilient infrastructure.”

**The lessons learned**

Robin has the following advice for learning providers who want to facilitate the use of wireless in their organisation:

- Look at what you already have, what your wireless network is capable of and think about what you want to achieve. There’s no use adding a state of art wireless network onto an aging switch/wired infrastructure
- Make sure you have the right balance between coverage and bandwidth. The requirement for multiple logins at the same time (i.e. 20 x laptops) means that your wireless access points (APs) need to be capable of load balancing to nearby APs. This can cause issues with too many APs and assigning channels etc
- Use the pre-sales stage as ‘free’ consultancy as much as possible. The sales team will often bring in pre-sales consultants if they feel it necessary and they often are as knowledgeable as the people who do the installation. Nothing is free once orders have been placed!
• Try the equipment before you place an order and be open with people about pricing; we are spending public money and must demonstrate value for money and only the very best deal will be considered etc – this helps to drive the price down

• Give people the freedom to access the network but do it in a secure way.

Future plans for the college include ensuring that staff and students have the same experience whilst accessing internal systems at home out of business hours and on weekends. This will mean adding resilience to the existing external network by adding an additional commercial Internet connection alongside the JANET link with automatic failover if one link goes down. The college also plans to move to Office and Exchange 365 and cloud based systems to facilitate 24/7 access to resources.

Further plans include:

• Extend the use of mobile devices for teaching and learning

• Design a curriculum around the use of mobile devices, using Augmented Reality

• Investigate the use of Augmented Reality (AR) in conjunction with teaching and learning and the development of Augmented Reality themed Learning Spaces to facilitate research, activities and course modules.

**Useful links**

• [Extreme Networks](#)

• [Shrewsbury College of Arts and Technology](#)

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