

# New College Durham revolutionises learning experience and reduces ICT expenditure

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Ian Walton, Director of Finance & Corporate Services at New College Durham.

## > New College Durham

Long gone are the days when a blackboard was the most technologically advanced tool in the classroom. In today's educational environment, students and teachers require information quickly and efficiently, and ICT is becoming increasingly important to modern learning. With the Government incentivising schools to use technology, and the technology itself luring prospective students to institutions, achieving the right blend of hands-on teaching and innovative ICT is imperative.

Moreover, in a sector where every penny counts, being able to maximise resources and reduce expenditure is vital. Today's educational institutions are becoming experts in this juggling act and New College Durham is a prime example of this.

New College Durham is a mixed economy institution, offering courses and programmes of study across a wide range of vocational areas. The College provides further education for full and part time learners and is the largest provider of vocational higher education in County Durham.

In October 2005, New College Durham finished a major regeneration project by completing building works on a brand new campus. With state-of-the-art facilities, the College was an attractive proposition to prospective students, but it recognised the need for a completely new ICT infrastructure to set itself apart from other educational establishments.



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## The Task Ahead

The College's old ICT network was inflexible, expensive to maintain and out of date. The new campus required an integrated, more manageable network to support an advanced teaching and learning environment, and complement the fresh, new campus. At a more pragmatic level the College also needed to reduce its ongoing infrastructure costs and, at the same time, find a way to greatly improve the coverage and effectiveness of their existing CCTV surveillance system. Overall, the project had to satisfy three distinct groups:

- Students and teachers - flexible learning tools to allow these groups to work the way they want to and have access to information in a timely fashion. Improved student security was another concern, as the existing CCTV network had to be extended to ensure that potential coverage black-spots were eradicated
- IT - the new network had to have the bandwidth and resilience to ensure 24/7 availability, but had to help reduce overall expenditure
- Facilities management - as one objective was to reduce ongoing infrastructure costs, the project had to also look at ways of improving the day-to-day running of the campus

This was no easy task given that any new converged infrastructure had to run alongside and integrate with the existing disparate voice, data, storage and surveillance networks. Any work had to be carried out in tandem with the smooth running of the campus and faculty activities.

“The primary aim of the project was to stop staff being shackled to their desks,” said Alan Race, New College Durham’s Head of ICT & Purchasing. “Staff previously had to return to their own phones periodically throughout the day to check for voicemails. An integrated solution allows users to work more efficiently as messages can now be retrieved, played, forwarded or stored for future reference in the same way as their emails. This helps save staff time and increases the time spent by teaching rather than administrating.”

## Out with the old....

Core to the project was improving the learning experience across the College. The College defined the ‘learning experience’ as:

- The acquisition of knowledge and skills, i.e. how students accessed learning materials, the use of simulations and multimedia content
- Teaching delivery, i.e. multimedia presentations, on demand and remote teaching and differentiated learning
- Assessment, i.e. immediate, on demand and with action planning, formative and summative and assignment preparation
- Portfolio recording, i.e. the integration of learning delivery with national and regional Student Information Systems
- Attendance recording, i.e. online enrolment and attendance registration
- Student facilities, i.e. email and Internet access for all and business relevant software tools

Knowing this was going to be a challenge, New College Durham turned to networking specialist Telindus to help them. With experience in converged voice and data networking that includes The Royal Hospitals, Belfast, and wireless infrastructures at Manchester Airport, Telindus was the obvious choice.

“Telindus recommended the integration of voice, data and video surveillance onto a single network and we felt they were the best company to offer us this complete solution,” commented Ian Walton, New College Durham’s Director of Finance & Corporate Services. “This was a complete leap forward in technology for us, but we trusted them to deliver the right network infrastructure for our needs because we knew the team had strong systems integration experience and skills.”

The overall project was complicated by the fact that the ‘new’ campus was built on the site of the working ‘old’ campus. This necessitated the phased move of staff and students into new working accommodation with the support of ICT services. As a result Telindus, together with the College staff, had to develop transitional networks to allow for the smooth progression from the old to the new network infrastructures to the new

with minimal impact on learning. The network design met the following criteria:

- Redundant Core switching providing resilient services
- A high capacity and high performance switching architecture
- Alternate routes to the core switching providing resilience in the event of fibre failure between buildings
- Low contention ratios for end users accessing core services
- Scaleable core switching to provide for future capacity expansion
- The capability to efficiently support various network services by the use of QoS
- A single IP network infrastructure that supports data, telephony and CCTV
- The capability to add wireless, remote access and security devices without changing the architecture
- Easy to manage and maintain

Telindus designed and installed a resilient, converged IP network using Cisco Systems equipment for the core infrastructure and IP telephony; a unified messaging system from Topcall; and digital video surveillance systems from DVTel, IPIX and NMI.

Telindus also provided project management, pre-staging and testing for the new network prior to starting the migration. For the duration of this, Telindus had to provide interoperability with the existing network, which was still in use by students and staff.



The new College network was designed using dual, chassis based switches at the core which provide high capacity, resilient layer 3 GbE switching. Users are connected via 24 port, 10/100 edge switches that provide in line power for IP telephones. Each edge switch has a redundant path to the core, with a connection to both core switches, ensuring a robust, resilient infrastructure without single points of failure.

This architecture provides the best infrastructure required to run the converged services and applications required by the College. Voice services are provided by a Cisco IP telephony system comprising dual Call Managers, a combination of servers running call processing software, and a gateway between the IP telephone system and the PSTN and IP telephones. Cisco Call Manager provides the call processing functionality, with the software running on the Cisco Media Convergence Server. The solution uses dual servers in a redundant configuration to provide a high availability telephony solution.

The Gateway is proved by a Cisco 3725 multi service router configured with two E1 interfaces for connection to the PSTN and dual Ethernet ports to connect into the LAN. A mixture of Cisco IP 7905, 7960 and soft phones are used for telephony subscribers.

“Managing the migration path from the old ATM network and advising us on the technology needed for our new network infrastructure was a key part of the project. It was a difficult process, as both old and new networks had to run at the same time, but this was managed extremely professionally and we received a lot of support and advice,” commented Walton.

The old campus had traditional CCTV cameras, running on a separate analogue network. The security cameras (both IP and analogue) are now connected directly

into the IP network and can be viewed anywhere there is a network presence. This makes management of the cameras much easier and increases flexibility in providing access to view the cameras.

## The results

Once completed, the new network instantly transformed the daily working lives of all concerned. The system offers vast improvements in flexibility, manageability and Total Cost of Ownership (TCO), through the integration of services. It has given the College the capacity to connect all services over IP, enabling staff and students to access to their IT information wherever they may be on campus.

For staff, this means a mobile working environment so that they do not have to return to their offices repeatedly during a day to download material. Instead, they can access teaching aids from any location and instantly link to new equipment, such as interactive whiteboards, in the renovated classrooms. The College has also benefited from improved online learning delivery platforms and has adopted the new technology with ease. The initial deployment of a unified messaging system has saved staff huge amounts of time as they can now retrieve important messages from anywhere on campus. The College invested in awareness days to train staff in how to maximise use of the new systems.

On the student side, the converged network has not only benefited their in-class experience, but has also improved their way of life. Security has been increased with the introduction of student and staff ID cards, and an integrated IP-based CCTV surveillance system. The new CCTV system has already had a marked effect, reducing theft and vandalism by 64 per cent.

Improved information security is also available as the project provided the College with the opportunity to upgrade all its online security measures, such as email and Internet monitoring, firewalls and network authentication.

New College Durham now benefits from a system that has considerably lower operational costs, compared to the disparate solutions previously used. Since the completion of the project, the College has saved almost £150,000 in cabling, ongoing maintenance and the reduction in fixed PCs. The internal management of the new IP CCTV and VoIP systems has alone reduced expenditure by £40,000.

## Looking Forward

“The possibilities with the new network infrastructure are endless. We now have an end-to-end solution, with a clear roadmap for adding productivity enhancing applications – all at a low cost of deployment. Telindus’ huge range of expertise and technical skills ensured that this project was a success. Our new network infrastructure is everything we wanted – efficient, reliable and able to support our vision of being a leading UK college,” concluded Walton.

The College is considering further developments, including the adoption of campus wide wireless networking, video streaming, and delivery of network based live television.

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