Queen Margaret University

Case Study

Challenge: Planning the 21st Century University

A new Scottish university campus in Edinburgh is setting high standards for both energy efficiency and how a university can use information technology to create a much more flexible and inspiring learning environment.

Natural ventilation is intrinsic to the sustainable design of the Craighall campus but this posed a challenge for the information services department at Queen Margaret University. Information resources and applications that are fully accessible anywhere anytime are essential for how students and staff work and learn more productively. The problem is standard PCs consume too much power and pump out too much heat to run in large numbers without air conditioning.

The answer is a mass switchover from PCs to an IT infrastructure based on thin-client computers and a strategic change to use of centralised computing. The solution used the latest thin-client technology from Wyse to deliver the highest possible energy efficiency without compromising on IT performance for the many staff and students of the university.

Moving to Craighall

Queen Margaret University has a long history of achievement and progress extending over a century. Founded in 1875, the institution comprises schools of business, enterprise and management; drama and creative industries; health sciences; and social sciences, media and communications. The university is internationally known for its output of high quality applied and strategic research, notably in health sciences, food and nutrition, communications sciences and theatre arts.

The rapid growth of the university was putting a strain on the existing buildings built in the 1960s. Located across three separate sites, these were inflexible and unsuitable for modern teaching and learning. A decision was eventually taken to relocate to a single new purpose-built campus for all departments. Craighall on the outskirts of Edinburgh was chosen by the university as the site for Scotland's first purpose built university campus of the 21st century.

Challenge: Green Computing Without Compromise

In October 2003, the university set out its vision for an academic village that combined a sustainable development with a state of the art Learning Resource Centre providing information services to over 4500 students and staff, plus visitors and members of the local community.

Fraser Muir, now director of information services and the learning resource centre, recalls how the ambitious plans for a new sustainable campus influenced the decisions about information technology for the new campus:

"The building design stipulated that the desktop computing platform should be limited to approximately 45 watts of power per device. The heat produced by conventional PCs combined with the heat generated by people simply could not be handled by natural ventilation. So a better solution needed to be identified"

The recommendation was to look into thin-clients because these minimized heat generation.

Although this met the energy efficiencies demanded by the architects, Fraser needed re-assurance that information systems based on thin-clients could deliver the same, if not better, performance than the networked PCs already in use by staff and students.

A proof of concept was set up and managed by Fraser and his team in January 2005 with over thirty potential users drawn from different parts of the university. This used Wyse thin computers – a mix of Wyse 9150s and 5150s – and Hewlett Packard blade servers, and tested how well a range of applications performed when accessed from the thin-clients over a network to a central data centre.

"Regardless of how energy efficient thin computers are it was absolutely essential that they met our requirements and delivered the vision we had for how information services would be intrinsic to the delivery of the whole learning experience at the new campus. This six month proof of concept demonstrated that thin-client computing could meet our needs. We had expected problems but all went pretty well with no real show-stoppers": said Fraser.

Solution: Going with Wyse

A decision was taken in summer 2005 to proceed with thin computing for the entire new campus.

A formal competitive EU tender was issued with a selection process that set out clear guidelines about how the new system had to deliver cost and operational efficiencies. Suppliers also were scrutinised about how much they met wider environmental criteria in terms of how they ran their own businesses and manufactured and recycled hardware to the highest green business standards including ISO 14001.

Seven suppliers of equipment from three thin-client manufacturers were assessed against these tough criteria and the Wyse V50 Linux-based thin client was judged to meet requirements most closely.

"Wyse came top because their technology best met our requirements. It also was clear that their technology was more advanced than the competition especially in terms of the management console": explained Fraser.

A decision to go with Wyse in early 2006 led to the next phase of the programme to ensure the new building would open for students and staff in autumn 2007 with fully operational "green computing" solution. Fraser and his team began the process of migrating over 900 PCs to thin-clients, and putting in place the data centre infrastructure. This work had to be completed before the formal move into the new campus in summer 2007.

The final phase of the project has involved an additional 300 Wyse V50 terminals being installed in the Craighall campus over September and October 2007. With the first phase of the new campus open from September 2007, the project has seen the number of PCs reduced to approximately 50 and the activation of over 1200 thin-client computers in the new building. The remaining PCs are used to run specialist applications in certain departments including video editing software or non-standard hardware such as smart card readers.

Each Wyse V50 thin client consumes 17 watts of power compared to a average PC which can be up to 200 watts. The energy efficiency of the thin-client is replicated back in the data centre where the university chose the latest HP blade server technology whose power efficiency is some of the best in class.

Practical Benefits: Security & Support

The migration has gone smoothly because Fraser's team worked on ensuring the end users experienced no difference with using a thin client terminal compared to their previous PC. Each terminal comprises a Wyse thin client unit, a standard keyboard and flat screen monitor. In fact it has been the smaller footprint of the thin-clients that has stood out for some users.

According to Fraser: "Students really haven't noticed the changeover because we've deliberately made the interface resemble the Windows interface on a PC. The only real difference has been the replacement of bulky PC unit and monitor with a much smaller, smarter terminal. In fact we were a little concerned about units being stolen because they looked so fantastic but actually we've had no problems with thefts"

The university has taken full advantage of the thin-client's Linux operating system. Each thin-client runs a highly restricted configuration allowing connection to the QM managed desktop. This gives full access to the university's virtual learning environment and all of the applications including standard Microsoft Office tools. These are provided centrally from the data centre using Citrix Presentation Server and remotely using Citrix Access Gateway. This means the thin-clients cannot operate or even boot up without a network connection, making theft pointless.

Security wasn't the only consideration behind the university wanting the thin-clients to have a very simple specification. Maintenance and support of the institution's PCs had been a major drain on resources. The new thin-client system enables a much more innovative approach to ensuring end users have access to their data and applications whenever they need to.

The Wyse V50 thin clients can be swapped out and installed in a matter of minutes. This has meant that if a thin client device fails, the Information Services team unplugs the faulty device, plugs in a new device and this is fully set up and the user back working with minimum downtime.

Information about how the thin-clients are performing is provided by the Wyse Device Manager console. This allows the Information Services team to monitor all devices at all times. It takes full advantage of the thin computing model to centrally control the deployment of settings to a newly plugged-in device, simplifying the management of information services to the university's dynamic population of end users.

"The combination of Wyse V50s and the central management console enables us to deliver the right level of service to our end users. Our approach is we want to get them up and running as quickly as possible. With a PC this took a lot of time but with thin computing if a unit isn't working we simply replace it with a working unit and worry later about fixing it": said Fraser.

Benefits: the Green Computing Effect

With the start of the new academic year coinciding with the opening of the new campus the new thin computers are being used in earnest. The energy efficiency of the new terminals, which consume a 10th of the wattage of a PC, means that the end users are generating more heat than the computer terminal itself, believes Fraser:

"We've been shown that a human body of an average person at rest generates 356 BTUs (British thermal units), which converts into 75 watts. Even when you add in the power output of the flat screen, each thin computer terminal generates up to 42 watts".

The other visible change is how thin computing has made information access much more flexible and easy. Because the units are so small and light they can be installed securely almost anywhere, meaning that terminals are located nearly anywhere people need to access their personal data and applications. The Information Services department has installed thin client terminals in the Learning Resource Centre itself and the IT labs, as well as a wide variety of open access areas including the main atrium and the coffee shop.

One particular innovation is the rapid access area. This is a main corridor between lecture and seminar rooms and is lined with a high level bench, stools and over 40 thin client terminals. These are used by students to access the system either before or after their lectures to upload or access lecture notes and other teaching materials, plus email and the web.

Easy accessibility extends to access outside of the campus with end users able to access all their personal settings remotely over the Citrix Access Gateway. This facility is widely used by the teaching staff who can work from home or students with their own laptops and Internet connections. The Information Services department will be experimenting with the newly launched Wyse X90 thin-client notebooks to provide an option for the 800 students who will live on the campus and can book out a thin computer laptop for working in their room.

Ease of deployment

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Conclusion: Industry Accolades and an IT infrastructure for the future

The new thin computing infrastructure is largely installed and the Information Services department is concentrating on how it can continually improve how applications and data are delivered.

Energy efficiency was a real priority for Queen Margaret University and the large scale use of Wyse V50 terminals was one factor that contributed to the building gaining a BREEAM rating of "excellent" and the highest score recorded by any other similar university project in the UK. BREEAM stands for the Building Research Establishments Environmental Assessment Method and is regarded by the UK's construction and property sector as the measure for best practice in how buildings are designed and managed to higher environmental standards.

Wyse thin computing is helping to make the move to the new Craighall campus a huge success for Queen Margaret University. It is providing a much more flexible and reliable IT infrastructure that is easier to manage and is delivering higher levels of service to end users.

September 2007 saw the first phase of the new campus open and as the university continues to grow with new facilities opening on the campus, the ability of its Information Services infrastructure to serve a vibrant and growing academic community will key to the institution's success.

Case notes

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Case Study Summary

Customer

Queen Margaret University, Edinburgh, Scotland
550 employees, 4000 students

Challenge
Provide a flexible IT infrastructure to support staff, students and visitors to a new university campus.

The new IT systems had to be exceptionally energy efficient and generate a fraction of the heat in order to work in the natural ventilation used throughout the new building, which is designed to be sustainable.

The wider scale accessibility of IT resources had to be easier and more cost effective to manage and support than the current large community of PCs.

Solution
A thin computing IT infrastructure delivers personalised information services and access to university applications and data fully accessible from over a 1000 Wyse V50 thin clients located in learning resource centre, offices and open access areas. All information services are centralised on data centre servers running Citrix Presentation server.

Citrix Access Gateway enables home working for staff and students with personalised settings on their home PCs.

Results
Personal data, applications and learning resources fully accessible and usable over state of the art computer terminals.

Significant energy efficiencies with the new thin client terminals, which consume a tenth of the power required for standard PCs and produced less heat than the students and staff themselves.

Simplified support and maintenance means higher levels of end user satisfaction with problems rectified in minutes rather than hours.

A more flexible learning environment with personalised educational resources, email and the Internet accessible on secure terminals located where ever and whenever a student or member of staff needs access.

Improved security with thin client computers only functioning when connected to the network, making theft pointless and minimising security breaches.

Full remote working supported and access to personal setting supported.

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