



Case Study: Wireless

University Hospital of South Manchester embraces wireless for Hospitals At Night Project.

In order to comply with the European Working Time Directive (EWTD), the number of hours junior doctors are able to work per week has been severely limited. Enter “Hospitals at Night” (H.A.N.); an NHS scheme, initially introduced into 4 trusts, that is set to transform the way in which hospitals operate during the night across the UK.



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But a trusts' duty of care is not simply about the number of hours that a junior doctor can or cannot work – traditionally the out-of-hours period in hospitals has largely been the responsibility of junior doctors – there is a primary issue regarding the impact on patient care?

“This ultimately improves delivery of quality care”

Mark Blakeman,
Director of health informatics and development.

“This was the challenge. Reconciling the demands of the EWTD, with the needs of the patients” said Mark Blakeman, director of health informatics and development at University Hospital of South Manchester (UHSM). “However, by careful coordination of specialists in multidisciplinary teams along with efficient sharing of workload between staff and shifts, it is possible to enhance the assistance provided by junior doctors at point of care; this ultimately improves delivery of quality care that patients receive at night.”

However, coordinating specialists in multidisciplinary teams is no simple task. UHSM decided to meet this challenge head on. They opted to implement an Aruba Wireless LAN infrastructure provided by leading network integration company VANIX to underpin the award winning iBleep Rapid Response system which was developed at the James Cook University and won the Health Service Journal “Improving Care with Technology” award 2006.

“iBleep software enables clerical and medical staff to generate, accept and interact with calls generated from out of hours resource controllers. It needs a solid and dependable wireless infrastructure technology to support personal digital assistants (PDAs) which are carried by the junior doctors” said Kevin Pask, Head of sales at leading network integration specialists VANIX. “This means that health trusts would be better able to meet the EWTD targets”



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Staff will arrive for their shift and get issued the PDA. They log on to the system, and via the wireless system, servers verify their usernames and passwords. This system is also able to carry information concerning individual doctor and organizational information such as guidelines or clinical protocols (eg the BNF - British National Formulary).

“The priority of the calls can be determined locally”

Sue Barrow, General Manager.

The system uses Aruba wireless technology to stay in touch with “on call” teams at night rather than the traditional inefficient and often frustrating paging system.

When a ward requires medical help, the ward staff input demographic and clinical early warning score system (EWSS) data on the desk computer and send this information to the out of hours resource coordinator. The resource coordinator assesses the call and, aware of the availability, expertise and location of night staff, relay the task to a competent junior doctor and request that they perform the task.

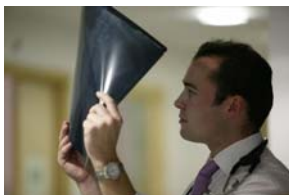
The Academy of Medical Royal Colleges has published an agreed statement about the “Out of Hours Medical Team” (OoHMT).

“The OoHMT is made-up of all the on-call junior doctors covering Medicine, Surgery, Anaesthetics and Accident & Emergency. The concept is that the junior doctors collaborate for the overall benefit of all the patients in the hospital. It is hoped that the situation, where half the doctors on-call are sitting watching television whilst the remainder are stressed by a surge of clinical activity, will be something of the past.

It is proposed that each acute hospital has a doctor who will lead and direct the OoHMT. The statement includes a range of suggestions that should help an acute Trust plan a happier and more effective environment for ‘out-of-hours’ clinical care”.

The document can be accessed at:

<http://www.rcplondon.ac.uk/news/ewtd.asp>



“The priority of calls are weighted using a flexible Red, Amber, Green (RAG) system, the nature of which can be determined locally depending upon the situation as determined by the trust at any time” said Sue Barrow,

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The system, via the Aruba wireless network, helps to reduce inefficiency

One of the General Managers at the trust. Typically “Red” condition calls may get attention immediately; “Amber” calls perhaps attended within 30 minutes and “Green” (less urgent) calls within one hour. A free text facility allows for real time information updates such as blood pressure, temperature or recent medication. The recording of EWSS data from drop-down menus and check boxes provide for lack of duplication and eradicate errors.

When the call is passed to the appropriate medical staff, the information, patient demographics, ward/bed, and clinical data will appear on the junior doctors’ PDA. The doctors simply tick a box to activate icons on the iBleep PDA to record that they are on their way to a call, again upon arrival at bedside and once more upon completion of each individual. To ensure security, this data is stored on the central server – not the PDA – thus an audit trail is created on every part of the call ‘history’. Hospitals can also analyse the number of specific incidents by ward, doctor, patient, response times and time to call completion.

As well as giving night staff access to information at point of care such as local policies and protocols the system, via the Aruba wireless network, also helps reduce inefficiency which will help manage service capacity given the reduction in junior doctors hours.

UHSM decided to deploy an Aruba wireless system from network integration specialists Vanix because of the manageability and security the system offers. “UHSM previously had a smaller WLAN infrastructure deployed, but to scale to the size of around 200 access points requires a system with excellent manageability, control and security. As well as an integration partner who understood their specific needs” said Kevin Pask of Vanix.



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Kevin Pask, Vanix

The Technical Solution

The Vanix wireless mobility solution is based on Two Aruba Networks 6000 mobility controller chassis as the core. Each chassis is populated with an Aruba Supervisor; a module which provides support for up to 256 Access Points (AP's). A 2-port Gigabit Ethernet line module (with Two 1000BaseT GBICS) was also required to provide connectivity into the Hospitals' existing HP-series chassis switches in the main computer rooms.

Both chassis are equipped with dual redundant power supplies. This dual core configuration will provide the Hospital with full redundancy in the event that one chassis should fail. The chassis' interconnect and use VRRP technology; should one of the devices fail there will be no effect on the operation of the wireless mobility infrastructure.

The Aruba 6000 mobility controller is the industry's only WLAN chassis based platform and is designed to specifically run centralised security functions such as controlled access point management, 802.11x authentication and encryption, site-to-site and client VPNs using IPsec/3DES encryption, stateful policy enforcement firewalls, Layer 1 to Layer 7 intrusion protection, endpoint integrity checking, and seamless user roaming between access.

This means that mobile users and devices do not connect to the network through a fixed port, therefore the network must identify every user and device that joins the network.



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“To ensure the system is effective, we need to guarantee secure wireless access everywhere our night doctors are likely to be”

Ray Burdge, IT
Manager

Once their identity is known, custom security policies are applied to the device so that the junior doctors and other night staff get access to only the appropriate information. This drastically improves network security by eliminating excess privilege on the network whilst providing identity-based auditing.

The project is currently in pilot in the UHSM burns unit and Cardiology wards, but when the project is fully rolled out, South Manchester will have over 200 Access points.

With so many end users, to ensure that the network was secure against loss or theft of the PDA's was of prime concern; “No patient records are held on the PDA, everything is held on the server,” Said Ray Burdge, IT Manager at UHSM, “Medical staff log on and off when they come on shift, and if they lose their PDA, they simply inform the out of hours resource controller (Ward Sister) who will immediately cancel their sign-on and the PDA becomes redundant.”

“To ensure the system is effective, we need to guarantee [secure] wireless access to 101% of the areas that the junior doctors are likely to be; wards, corridors, rest-rooms and theatres”, said Ray. “With such a huge rollout, our responsibilities extend from managing the implementation of the system to training users and post-project change management issues”.

Using the iBleep system over an Aruba wireless mobility solution means that UHSM are well on the way to providing supervised multi-speciality handover in the evenings, reducing unnecessary duplication of work on the night staff and improving the provision of information at the point of care whilst still meeting the demands of the EWTD.



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