Creating a platform for a new approach to healthcare

With fixed and wireless solutions from BT and Cisco, the Royal Cornwall Hospitals Trust is making enormous strides in improving the quality and efficiency of patient care.

Executive Summary

The Royal Cornwall Hospitals Trust provides acute services to Cornwall and the Scilly Isles. Its key challenge is to see more patients more quickly at less cost, without reducing the quality of patient care. Solutions depend more and more upon the use of technology, and the Trust has worked in partnership with BT and Cisco for seven years. All five of the Cornish NHS Trusts have been connected over a single community of interest network on a BT Metro VPN platform, linked to the NHS national infrastructure. An example of the innovation that the network allows is telemedicine between remote minor injuries units and main A&E departments.

BT-managed Cisco Gigabit LANs enable hospitals to run, for example, the PACS application that allows medical images to be stored electronically and viewed anywhere. The Trust has adopted Cisco wireless technology right across the campus at its main Truro hospital, with 524 access points. A BT-managed Vocera Communication Solution provides handsfree mobile VoIP telephony to Clinical Imaging Assistants over the wireless network. The 15 miles a day that a Clinical Imaging Assistant could walk before using Vocera has been halved. The solution has contributed to a productivity improvement of 40 per cent in Computer Tomography. Vocera will next be extended to clinicians.

The wireless network is bringing benefits in other areas. PACS images can be viewed and compared anywhere including the use of mobile devices. Wireless technology allows clinicians to enter and retrieve data at the patient’s bedside. The Trust is looking at using the wireless infrastructure with RFID tags for asset management and patient identification. By integrating mobile devices with robotic dispensing, true bedside prescribing will be enabled. BT brings added value such as reporting tools for operational and financial analysis, and its experience in ROI realisation means that BT Cisco healthcare solutions do not increase cost but rather release value and free resources.

Marketplace

The Royal Cornwall Hospitals Trust provides acute services to the county of Cornwall and the Scilly Isles. It employs nearly 5,000 people—serving a population of 400,000—with three main hospitals together offering 1,020 beds. In the summer season, the Cornish population is swelled by millions of visitors, greatly adding to healthcare demands across a widely dispersed geography.

Simon Goodwin, IT Director for Cornwall & Isles of Scilly Information & Technology Services (CITS), says: “The key challenge for the Royal Cornwall Hospitals Trust and the wider health community is to see more patients more quickly at less cost, yet without reducing the quality of patient care.”

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Simon Goodwin
IT Director
Cornwall & Isles of Scilly Information & Technology Services
Case study
Royal Cornwall Hospitals Trust

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Gary Spencer
Business and Information Programme Manager
Cornwall & Isles of Scilly Information & Technology Services

Key issues include such things as localising healthcare, eliminating delays in hospital admission and discharge, and increasing choice through a range of providers and treatment options. Such ideas depend more and more upon the use of technology for their success.

Business opportunity

In pushing the boundaries of technological innovation, the Royal Cornwall Hospitals Trust has worked in partnership with BT and Cisco for seven years, addressing together some of Cornwall’s most difficult healthcare issues. Gary Spencer, Business and Information Programme Manager at CITS, says: “There is remarkable synergy between us. Today’s healthcare technology environment is very fast moving, and so is the networked IT services industry. BT and Cisco understand the unique dynamics of the sector and are always looking for ways to benefit both staff and patients.”

Working with BT, CITS has networked together all five of the Cornish NHS Trusts over a single community of interest network (COIN). That network sits on a BT Metro VPN platform, which uses multi-protocol label switching (MPLS) technology running over Cisco equipment at the core and the edge. It interconnects with the NHS infrastructure at two key nodes, offering a seamless and resilient interface between Cornwall and the rest of the UK.

An example of the innovation that network allows is telemedicine. Accidents are not uncommon on Cornwall’s beaches and remote spots, especially in the summer months. The COIN interconnects the majority of Cornish GP surgeries and remote minor injuries units, enabling them to share images with main A&E departments as well as using videoconferencing with centrally located doctors to aid diagnosis.

At the local level, Royal Cornwall Hospitals Trust has BT-managed Cisco local area networks (LANs) that run at Gigabit speeds. The LAN at the Truro main hospital has over 5,000 ports, enabling the hospital to run the NHS PACS (Picture Archiving and Communications System) application. Gary Spencer says: “PACS allows images such as X-rays and MRI scans to be stored electronically and viewed anywhere, such as at the patient’s bedside or even at a remote surgery.”

PACS is an enormous improvement on the old system where physical films had to be transported around: it speeds diagnosis, especially in A&E, and virtually eliminates the chance of mistakes being made. However, when applications such as PACS are teamed with wireless technology, truly extraordinary things begin to happen.

BT solution

Simon Goodwin picks the story up again: “Hospitals are the most dynamic environments imaginable, and Cisco introduced us to the idea of wireless technology to take advantage of that dynamism.” One particularly strong aspect of the partnership is that BT and Cisco bring examples of best practice from other sectors that CITS can apply to healthcare in Cornwall. Simon continues: “For example, it was BT’s demonstration of Vocera that was the trigger for us to adopt wireless technology right across the campus at our main acute unit in Truro.”

The BT-Managed Vocera Communications System provides handsfree telephony to people on the move using voice over IP (VoIP) technology running over the wireless network infrastructure. It uses a lightweight “badge” that can be hung around the neck or clipped to clothing. Being entirely voice activated, Vocera users are able to get on with their jobs while simultaneously attending to live phone calls and messaging.

At the Truro hospital, Clinical Imaging Assistants help to move patients and equipment to and from – and within – the radiology department. The hospital had been using a semi-automated workflow management system called AuSpEd that knew which patients needed to be taken from which ward to where. Although AuSpEd allocated work to Clinical Imaging Assistants based upon availability, it required them to report back to base after each assignment to collect the next job.

Susan Batkin, Project Manager at CITS, explains: "With Vocera integrated into AuSpEd we would be able to communicate direct with our Clinical Imaging Assistants and dynamically assign jobs to them, dramatically reducing wasted time." BT arranged the systems integration and supplier liaison required to enable Vocera to interoperate with the AuSpEd application as well as with the existing PBX. At the same time, BT produced the system specification and provided AuSpEd with a test system, so that its people could write the required software code.

A complete BT Managed Vocera Communication Solution was provided including specialist engineering skills and ongoing support. One area of the hospital was wireless-enabled as a test bed and the Clinical Imaging Assistants were trained to use the new technology. The system is so intuitive that familiarity is achieved in a few minutes.

With the new integrated Vocera-driven system a ward or radiographer reports their needs to the AuSpEd application via a workstation. The system knows which Clinical Imaging Assistants have which jobs and the wireless network knows where they are. AuSpEd can therefore make screen-based work scheduling recommendations. The server flags to the supervisor the next available closest Clinical Imaging Assistant, and the job is then signalled to that person via the Vocera badge.
Case study
Royal Cornwall Hospitals Trust

“In order to take full advantage of the Vocera system, we had to upgrade our local area network to full wireless working,” says Simon Goodwin. “We now have a Cisco-based wireless network with 524 access points, both indoors and out. This was a massive infrastructure project, and we believe the number of access points makes it the largest such campus network in Europe.”

In fact, the wireless survey took six BT people five days to accomplish, and Cisco provided specialist system engineering support. The BT-managed Cisco wireless solution is an intelligent wireless solution with a central controller individually managing the wireless access points. That means, for example, that a person on the move will be seamlessly handed-off from access point to access point without losing the connection. The access points are intelligent too, for example if one drops out an adjacent access point will increase power to compensate.

Results

In the Truro hospital, some thirty Clinical Imaging Assistants are equipped with Vocera badges. In choosing to adopt Vocera technology, the Trust was not seeking staff savings but improvements in efficiency and customer service, and Vocera is facilitating achievement of a number of key business indicators.

Susan Batkin comments: “We are seeing tangible benefits from the use of Vocera. Before using the system, a Clinical Imaging Assistant could walk 15 miles a day. Since adopting Vocera that distance has been halved.” As an example of what that means, eight Clinical Imaging Assistants over a seven-hour shift saw their throughput increase from 40 tasks to 87 tasks. The time saved is put to good use.

Simon Davis, one of the hospital’s Clinical Imaging Assistants, says: “This new system has transformed my working life. Time that I used to spend to-ing and fro-ing to base is now devoted to patients. And I’ve lost count of the number of compliments I get about how promptly we arrive. The system is particularly good for night workers, who feel safer and more in touch. Patient emergencies are being handled more quickly, potentially saving more lives.”

The Trust has a very busy Computer Tomography scanning department and better resource utilisation means that the five staff can get in 22 extra scans per day, which means that Vocera and the Cisco wireless network have contributed to a productivity improvement of 40 per cent.

“We are considering extending Vocera to provide a clinicians’ wireless communications system next,” says Susan Batkin. Communications between departments will be instant, allowing real time clinical information flow between colleagues, and clinicians’ working lives will be improved. Susan adds: “We can see new applications for Vocera technology right across our hospital estate.”

The wireless network is already bringing huge benefits in other areas. PACS images can be viewed and compared anywhere using laptop computers and other mobile devices. Wireless technology allows clinicians to enter and retrieve data at the patient’s bedside. That means that data is entered once only at the point of need, obviating the need for double entries. In turn that eradicates errors, eliminates transcription, and saves the time of people running around to find paper-based notes.

Susan Batkin says: “We are also looking at using the wireless infrastructure with RFID tags for asset management. That, again, will considerably improve resource utilisation. Furthermore, by integrating mobile devices with our robotic dispensing system we will enable true bedside prescribing, with significant benefits in terms of the speed and accuracy of treatment.”

BT brings added value such as reporting tools for operational and financial analysis, and its experience in ROI realisation means that BT Cisco healthcare solutions do not increase cost but rather release value and free resources. In addition, BT is commercially flexible, enabling CITS to negotiate the right deal and take advantage of discounts. Gary Spencer says: “In the future we are looking to negotiate innovative financing models, such as linking payment to benefit realisation.”

Simon Goodwin concludes: “Mobility through wireless technology enables healthcare professionals to work the way that care is delivered. Supporting those professionals on the move will both improve patient care and make it more efficient. It’s a great example of 21st Century technology supporting 21st Century healthcare.”

Why BT and Cisco?

• BT and Cisco are trusted partners to the Royal Cornwall Hospitals Trust
• BT and Cisco understand healthcare issues and provide innovative technology-based solutions
• BT has the capability to draw together all the components of a complex bespoke solution, and manage them in one co-ordinated package
Technology blueprint

The Royal Cornwall Hospitals Trust COIN sits on a BT Metro VPN platform, which uses multi-protocol label switching (MPLS) technology running over Cisco equipment at the core and the edge. It connects 160 Cisco router-equipped sites throughout the county. At the Truro hospital a Cisco Gigabit LAN extends to some 5,000 ports. The BT-managed wireless network platform uses Cisco technology to provide a centralised, scalable solution built on 524 autonomous Cisco wireless access points in a mixed configuration of 1100-series, 1200-series and 1300-series devices. Operating on 802.11 protocol it utilises centralised controllers and a dedicated management platform within a Cisco Structured Wireless Aware Network (SWAN).

The BT Managed Vocera Communications Solution provides hands-free, voice communication throughout any 802.11b networked building or campus. Vocera is designed to increase business productivity, teamwork, and customer service levels.

The system enables fluid, instant voice conversations among team members, across groups, and throughout an organisation of mobile professionals. The BT Managed Vocera Communications Solution is made up of two elements: the Vocera System Software and the Vocera Communications Badge.

The Vocera System Software runs on a standard Windows server and houses the centralised system intelligence: the call manager, user manager, and connection manager programs as well as Nuance speech recognition software and various databases. The Vocera Communications Badge is a wearable device that weighs less than two ounces and can easily be clipped to a shirt pocket or worn on a lanyard. It enables instant two-way voice conversation using natural spoken commands. When a live conversation is not necessary, text messages and alerts can be sent to the LCD screen on the back of the Vocera Communications Badge.

Main BT and Cisco products and services

- BT-managed Cisco-based wireless local area network
- BT-managed Vocera Communication Solution including voice-activated badges and server hardware and software
- BT system integration services
- BT Metro VPN platform, using MPLS technology

The BT Cisco value proposition

BT and Cisco share a powerful vision of the future of IP services. As global companies in strategic partnership on a worldwide scale we realise that vision for our customers – delivering and supporting innovative solutions to their business needs. We put a wealth of business and technical resources at their disposal. And BT and Cisco have built some of the largest and most successful IP-based platforms on the planet.

Our relationship has been established over decades of working together on foundation technologies and processes. For example, together we led MPLS development and were first to take the service to commercial launch. With Cisco a preferred supplier to BT’s groundbreaking 21CN network platform, and BT recognised as Cisco Global Managed Services Partner of the Year, we hope the partnership can only continue to strengthen and grow.