

French Hospital Increases Patient Satisfaction

Customer

Arras Hospital, France

Industry

Public sector:

Healthcare

Business challenge

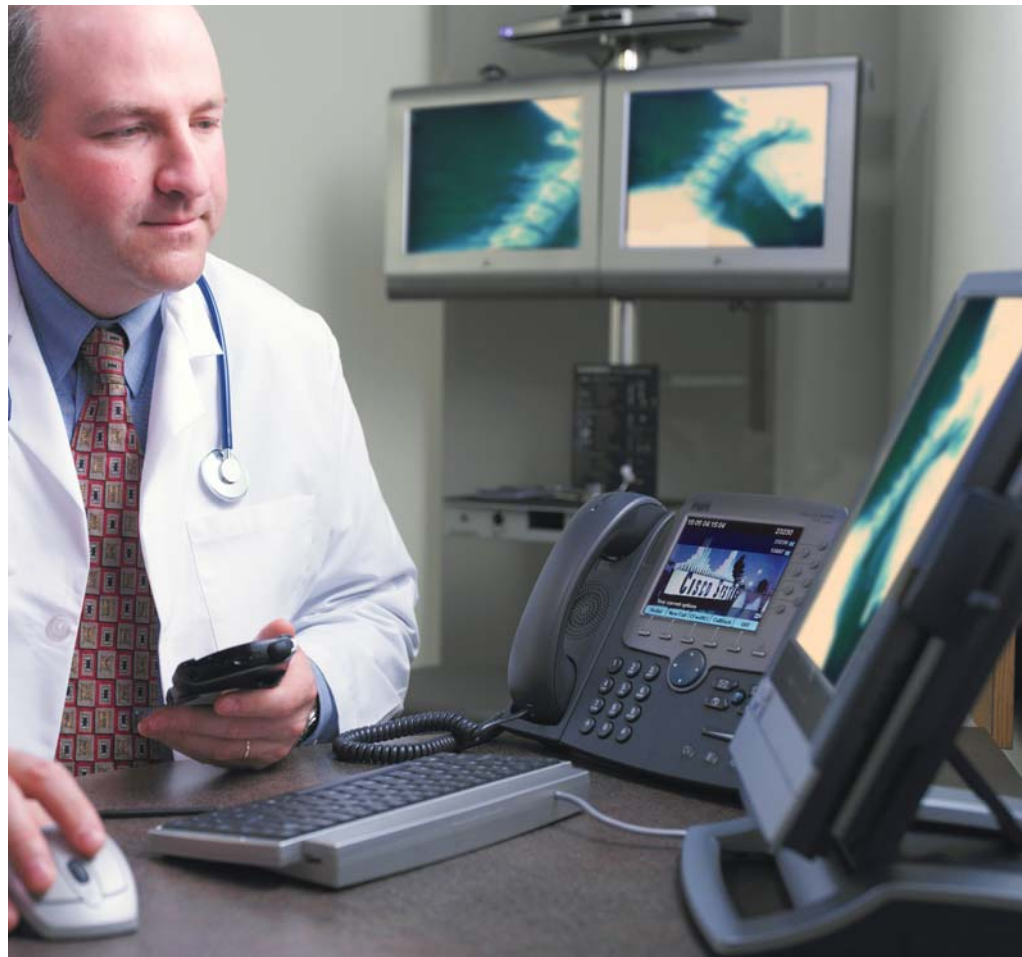
- To reduce operational and administrative costs
- To provide clinical staff with effective tools for mobile working
- To automate the hospital's processes
- To create an integrated platform for a 'connected' medical community
- To bring new services to inpatients

Network solution

- A Cisco IP-based infrastructure that connects the 18 sites on the hospital's campus and offers a secure, high-performance and reliable platform for voice, data and video
- A network core of Cisco Catalyst 6505 Series Switches and Cisco Catalyst 3500 Series Switches, with a backbone speed of 4 Gbps that will rise to 10 or 40 Gbps by 2006

Business value

- Better access to information makes mobile clinical staff more efficient
- Centralised availability of data such as electronic patient records reduces errors and helps to enhance patient care
- High-performance network enables the creation of an online medical community that connects Arras Hospital, 1,500 health centres and practitioners in its region, and the ambulance service
- Increased patient satisfaction due to improved efficiency and access to information and other services
- Reduced administrative costs together with improved medical and financial performance



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“THANKS TO THE INTELLIGENT SYNERGY BETWEEN CISCO SYSTEMS AND ITS PARTNER NCS, OUR NETWORK IS BOTH 100 PER CENT RELIABLE AND FULLY SCALABLE.”

DR ARNAUD HANSSKE
INFORMATION SYSTEMS MANAGER
ARRAS HOSPITAL

Arras Hospital in northern France has transformed its operation from the ground up by re-building the campus, automating administrative processes and enabling a new work culture. A state-of-the-art Cisco network has provided mobile access to centralised data for hospital staff and regional health centres, helping to improve efficiency, reduce costs and enhance patient care.

BUSINESS CHALLENGE

Arras Hospital is one of the largest in the Nord-Pas-de-Calais region of France, employing 2,000 staff who treat over 100,000 patients each year. It provides health services to a population of 230,000 residents in the fields of surgery, general medicine, obstetrics and gynaecology, psychiatry, and geriatric care.

By the end of the 1990s the hospital, founded 40 years earlier, was experiencing difficulties. The running of the institution had become expensive, the buildings were ageing badly and the IT infrastructure was over-extended. In 2001, with a new general manager at its helm, Arras Hospital decided to transform its operation into a modern, patient-centred healthcare campus.

This ambitious plan would involve re-building parts of the hospital, re-furbishing others, and completely replacing the legacy IT systems. A major undertaking in its own right, the IT overhaul would not be financially viable without also re-structuring the organisation's internal processes and changing its culture.

The new Aloïse Corbaz psychiatric wing was chosen as the pilot site for the entire project. With a mission to ensure that all investments led ultimately to higher quality patient services, the hospital had identified several objectives:

- To reduce operational and administrative costs
- To provide clinical staff such as doctors and nurses with effective tools for mobile working
- To reduce the administrative burden of clinical staff in order to improve patient care
- To use new technology to communicate with the entire medical community in the region, so improving patients' access to services and raising overall standards of care.

Under the leadership of Dr Arnaud Hansske, the new Information Systems Manager at Arras Hospital, it was also decided to introduce a Health Information System (HIS). This would enable the creation and centralised storage of electronic patient records, an important step towards automating processes and reducing the level of paperwork within the organisation. The hospital chose the Clinicom HIS application from Siemens Medical Solutions.

In selecting a new network infrastructure, the organisation was seeking to achieve a number of technology-related goals that would contribute to its overall strategy of improving patient care.

- It wanted to provide staff – and, ultimately, patients – with access to a converged platform that would carry voice, data and video applications
- It wanted to remove the IT silos that had built up within each department and create a single, integrated environment for the entire hospital
- It needed to ensure that the network offered the highest possible levels of performance, reliability and security.

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NETWORK SOLUTION

Having issued an invitation to tender in 2001, Arras Hospital eventually chose Cisco Systems and its locally-based partner NCS (Networks and Communications Systems) to provide the new network infrastructure.

Cisco was chosen for the overall quality of its technology and solutions, and because its product portfolio was inherently flexible. This was particularly relevant during the construction and re-furbishment works, as it would allow the hospital to re-site and re-connect equipment quickly and easily whenever necessary. Another important factor was Cisco Systems' position as an established global manufacturer.

From a practical point of view, the hospital's decision was influenced by its plans to digitise as much information as possible: with confidential data such as patients' records on the network, security was of paramount importance. Digitisation would lead to a massive reduction in paperwork, meaning that the network would have to be available 24*7 for staff to access essential data at any time.

The hospital also intended to introduce bandwidth-hungry applications and services such as live video links, and a picture archiving and communications system (PACS) to enable the storage, retrieval and distribution of medical images such as x-rays on its infrastructure. High-speed network performance was therefore vital.

"Thanks to the intelligent synergy between Cisco Systems and its partner NCS, our network is both 100 per cent reliable and fully scalable," Dr Arnaud Hansske explains.

Cisco Medical-Grade Network

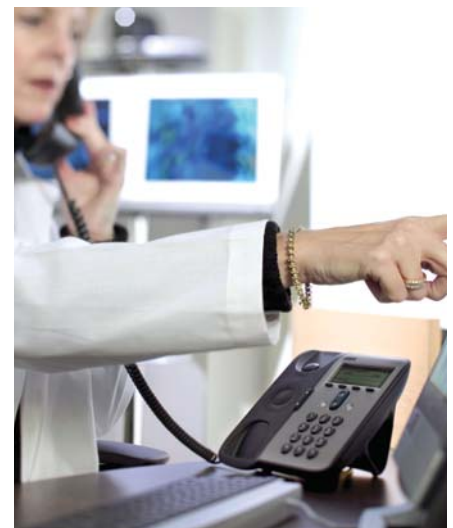
In selecting Cisco Systems, Arras Hospital was also laying the foundation for a 'Cisco Medical-Grade Network' which is designed to:

- Be resilient and responsive in a 24x7 environment that holds lives in the balance
- Optimise responsiveness at the point of care to reduce the number of medical errors and improve clinical productivity
- Use intelligence within the network to make the most vital information available when, where and for whom it is needed most
- Enhance integration of applications and services to improve diagnostic capabilities, reduce time to treatment for patients, shorten billing cycles and create new revenue sources
- Provide seamless communication regardless of device or location.

The hospital saw the principles behind the Medical-Grade Network as critical because they would support the organisation's over-arching goal of becoming completely patient-centric.

The Cisco IP-based infrastructure that has been installed throughout the hospital's 18 sites offers a secure, high-performance and reliable platform for voice, data and video. The core of the network consists of four Cisco Catalyst 6505 Series Switches, two Catalyst 4506 Series Switches and 25 Cisco Catalyst 3500 Series Switches, with a backbone speed of 4 Gbps that can quickly be scaled to 10 or 40 Gbps as the organisation changes and grows.

Arras Hospital initially deployed IP telephony over the network in three departments: the psychiatric wing, the nurses' training institute, and the nurses' home. Here, both wireline and wireless IP phones offer nurses flexible voice and data services. Staff in these



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departments are able to access patient records and other data while on the move, using a range of mobile devices such as wireless IP phones, Tablet PCs and personal digital assistants (PDAs).

As the entire Cisco infrastructure is wireless enabled, wireless access to voice and data services will be available to staff throughout the new hospital when it is completed in 2006. Patients' rooms will also be provided with services such as television, telephone, video and Internet access, all delivered over the Cisco network. IP telephony, the first of these services to be fully deployed throughout the campus, will be installed by the end of 2005.

"The security and reliability of our network are essential, particularly when WiFi terminals are being used," says Philippe Huddleston, IT and Telecommunications Manager at Arras Hospital. "We are confident about the quality of Cisco's solution and, having selected an end-to-end Cisco system, also benefit from full hardware and software compatibility."

BUSINESS VALUE

The introduction of IP telephony and wireless capabilities allows staff to view, enter or amend data directly, wherever they are. This mobile access has transformed the way in which staff work, often eliminating paperwork and duplication of effort.

For example, doctors on ward rounds in the psychiatric unit can change a patient's medication at the bedside using a Tablet PC, instead of writing a new prescription. The details can then be sent to the pharmacy, where an automatic stock check also ensures that new supplies are ordered if necessary.

Similarly, the results of blood tests carried out when a patient arrives at the hospital can later be viewed on a PDA, Tablet PC anywhere on the campus, by any member of clinical staff who is treating that patient.

Arras Hospital first provided handheld wireless devices to nurses, in an attempt to prove to them how useful these mobility tools could be. The strategy was an enormous success. In general, the nurses adapted well to using wireless technology and quickly understood how the applications available on the WiFi devices could help them to work more effectively. Having seen this successful outcome, more and more doctors are now starting to proactively request wireless devices for their own use.

Eventually all the nurses, doctors and administrative staff will be able to use IP telephony and WiFi capabilities to contact each other or access data on the network at any time, anywhere on the hospital campus. This will result in cumulative efficiency gains. Further improvements in efficiency are being achieved by automating the hospital's processes, thereby saving both time and money.

Arras Hospital plans to exploit its Cisco infrastructure to the full. In summer 2004, for example, it conducted a pilot to provide live video links between mothers – whether in the maternity ward or at home – and their babies in the neonatal intensive care unit. This type of service will be introduced during 2005 and is expected to be widely available to all patients by the time the hospital's refurbishment programme is completed in 2006.

Since the new network was installed in 2004, security has been a priority. An external security audit carried out that year resulted in a number of recommendations on how to further strengthen a system that is already highly secure. Cisco Systems and Arras Hospital

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have also designed the network with a high degree of built-in redundancy, in order to achieve availability targets of around 99.999 per cent in the near future for critical applications.

The network's high-speed performance is another huge benefit as it allows the transfer of large files, not only within the hospital campus but also among the wider health community in Arras. This urban area has 18 communes whose 1,500 health centres and practitioners joined forces some time ago to install a high-speed fibre optic backbone that would allow them to communicate more effectively. Now they are all being connected to Arras Hospital via secure links that will further increase administrative efficiency and enhance patient care. The regional ambulance headquarters (SAMU), located on the hospital campus, is included in that link.

Consequently, all health centres and the hospital will have access to the same data, ensuring consistency, and healthcare professionals will be able to update the centralised files quickly and easily. This holistic approach will also help to reduce the errors that can arise from inaccurate or incomplete patient records.

Precise figures are not yet available for the improvements that are taking place within Arras Hospital. However, as a result of introducing its converged IP infrastructure, automating its processes and re-modelling its approach to patient care, the hospital expects to enjoy significant benefits. In Montreuil-sur-Mer, where a similar re-organisation was implemented by the current general manager of Arras, the hospital increased its productivity by 40 per cent in spite of a 10 per cent reduction in staff and a 20 per cent reduction in the number of beds. At the same time, the institution's medical and financial performance rose almost to that of a private clinic. Arras Hospital is looking to achieve similar results within the next two years.

TECHNOLOGY BLUEPRINT

The core of the network consists of four Cisco Catalyst 6506 Series Switches with a Cisco Catalyst 6500 Supervisor Engine 2 module, two Cisco Catalyst 4506 and 25 Catalyst 3500 Series Switches. The backbone speed of 4 Gbps can quickly be scaled to 10 or 40 Gbps as the organisation changes and grows, providing ultra high-speed connections between the 18 sites on the hospital campus and some 1,500 regional health centres.

The campus-wide wireless capability is delivered by 150 Cisco Aironet 1230AG Series Access Points, with a Cisco Access Control Server for security and a CiscoWorks Wireless LAN Solution Engine for network management. Cisco support for 802.1x/LEAP (lightweight extensible authentication protocol) in its wireless portfolio provides user-based, centralised authentication and per-user wired equivalent privacy (WEP) session keys. This results in simplified user and security administration for wireless LAN network administrators. Cisco Aironet deployments around the hospital campus may send authentication requests back to the Access Control Server or RADIUS (remote authentication dial-in user service) server across a WAN link, providing the network with high-level protection from unauthorised usage.

The Cisco switches and WiFi and fixed terminals deployed in Arras Hospital all operate using in-line power, meaning that they draw their energy supply from the network cabling instead of a separate power supply. This makes them easier to set up and reduces installation costs.

“THE SECURITY AND RELIABILITY OF OUR NETWORK ARE ESSENTIAL, PARTICULARLY WHEN WIFI TERMINALS ARE BEING USED. WE ARE CONFIDENT ABOUT THE QUALITY OF CISCO'S SOLUTION AND, HAVING SELECTED AN END-TO-END CISCO SYSTEM, ALSO BENEFIT FROM FULL HARDWARE AND SOFTWARE COMPATIBILITY.”

PHILIPPE HUDDLESTONE
IT AND TELECOMMUNICATIONS MANAGER
ARRAS HOSPITAL

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Cisco CallManager software running on a Cisco Media Convergence Server (MCS 7835-H1) provides IP telephony, together with 250 wireline IP phones (Cisco IP Phone 7940G, 7960G and 7970G models) and 150 Cisco Wireless IP Phone 7920.

A Cisco Unity unified messaging server and Microsoft Exchange deliver combined voice mail and email services to 100 staff, increasing efficiency by allowing them to retrieve messages at all times.

Built-in design elements that enhance the network's resilience and availability include:

- Redundant power supplies
- Hot Standby Router Protocol which allows Cisco Catalyst 3550 Series Switches to provide routing redundancy, routing IP traffic without being dependent on the availability of any single router
- Doubly attached switches.

Overall network management is provided via two Cisco 2651 Modular Access Routers.



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