



UNIVERSITY HOSPITAL CHARLEROI

WIRELESS NETWORK FOR SERVICE STAFF AND PATIENTS

«THE CONSOLIDATION OF OUR COMMON NETWORK INFRASTRUCTURE ONTO CISCO TECHNOLOGY HAS GIVEN US PLENTY OF BREATHING SPACE TO DEVELOP FUTURE-ORIENTED APPLICATIONS, ALLOWING FOR EFFICIENT MANAGEMENT OF ELECTRONIC MEDICAL RECORDS. RECORDS WILL BE STORED IN A CENTRAL DIGITAL ARCHIVE AND WILL BE AVAILABLE FOR CONSULTATION FROM ANY LOCATION THROUGH OUR WIRELESS NETWORK.»

Jean-Pierre Binon, IT Director, University Hospital Charleroi

In a hospital, perhaps more than any other environment, technology must exist in service of the people. The University Hospital of Charleroi understands this all too well. That's why the hospital group has been investing in the establishment of a wireless network since 2004. In the course of 2006, the University Hospital of Charleroi will also put in place a new network infrastructure for data storage. Both investments are primarily designed to support the day-to-day working of the various hospitals but will indirectly benefit patients and even visitors as well.

NETWORK CONSOLIDATION

Because hospitals' network requirements are very demanding, the University Hospital of Charleroi has called upon the advanced network technology of Cisco Systems. That technology has been supplied by Dimension Data, an important partner and the largest distributor of Cisco equipment worldwide. «Our choice for Cisco Systems is quite simply a strategic decision,» says IT Director, Jean-Pierre Binon. It is a choice that goes back to the merger of the different hospital institutions of which the University Hospital of Charleroi is comprised today. After the merger, which became an official fact in June 2000, a short phase of consolidation followed. Inevitably, the separate networks of the respective institutions were effected, as they too needed integrating within a single, homogenous network infrastructure.

One of the locations, the André Vésale Hospital in Montigny-le-Tilleul, already employed a Cisco network infrastructure, and they were exceptionally satisfied. «We decided to switch the other networks over to Cisco as well. At that time, the networks at our other locations were still run using outdated technology such as Token Ring. We decided to switch to Cisco's new, and also cheaper, Ethernet technology for the whole consolidated network. In 2001, that consolidation phase was already complete. Before that, we had constant problems with the availability of our networks. Those problems have now been definitively resolved.»

EXECUTIVE SUMMARY

BACKGROUND

The University Hospital of Charleroi is a public hospital group administered by the ISPPC (Intercommunale de Santé Publique du Pays de Charleroi). The group totals more than 1400 beds, spread over 5 hospitals, in which over 40,000 people are admitted yearly. The University Hospital of Charleroi also comprises various day clinics, polyclinics and dialysis centres. The hospital group, employing around 4,000 people, is the base for 600 doctors performing more than 400,000 consultations a year. With a yearly turnover of approximately 300 million euro, the University Hospital of Charleroi also operates as a centre for scientific research and education, offering several internships to students. The ISPPC also provides other services, such as 300 beds in retirement homes, general and emergency day care for children and a centre for child welfare.

CHALLENGE

The University Hospital of Charleroi developed the core of its information technology system in-house. This system, the Système d'Information Médicale (SIM), provides support for all medical processes on the basis of each patient's electronic medical records. Because doctors, but also nursing staff, by definition work on the move, the need for mobile access to these records and other medical information is of utmost importance in a hospital environment. Because that need is most pressing during consultations, the University Hospital of Charleroi wanted to make this medical information accessible from as close as possible to the hospital wards and other places where consultations are regularly performed. In addition, the University Hospital of Charleroi was looking for a faster and more efficient storage and central processing of the medical data that circulate about the various institutions.

SOLUTION

The University Hospital of Charleroi opted for a wireless network infrastructure from Cisco, which it installed on its own. Access to the network is currently provided through Cisco's Aironet 1230 Access Points, but migration to Cisco's newest generation of WLAN products is planned in a follow-up phase of the project. That phase will also see the integration of the Airespace product range (acquired after a recent take-over), which will allow for a more centralised and therefore less complicated administration. In the meantime, network administration and security is provided through the CiscoWorks Wireless LAN Solution Engine (WLSE) and the Cisco Secure Access Control Server (ACS) respectively.

RESULTS

Investment in a wireless network infrastructure provides support, first and foremost, to the hospital group's doctors and paramedical personnel. Today, less time is lost through redundant or unproductive trips in search of medical documents. More time is freed, as a consequence, for the patients, thus improving the level of direct service provision. As the University Hospital of Charleroi has also planned the installation of a public hotspot in the near future, patients and their visitors will soon be able to make use of the new infrastructure as well.

As for the network connections between the different locations, preference again went to Cisco's offering. The core of the shared, distributed network is constituted by the triangle connecting the André Vésale Hospital in Montigny-le-Tilleul, the Vincent Van Gogh Hospital in Marchienne-au-Pont and the Hôpital Civil in Charleroi itself. The data transfer between the Hôpital Civil and André Vésale now takes place across a Gigabit Ethernet connection, while the voice transfer between the

two institutions continues to take place across ATM. This connection is also the main connection line between the two data centres based at these locations. Finally, the Vincent Van Gogh Hospital is connected with the two other hospitals via a 155 Mbps ATM connection. This simultaneously creates an alternative route between the two data centres in the event of an emergency.





STRIVING FOR HOMOGENEITY

The choice for ATM and Gigabit Ethernet connections was motivated by the hospital group's specific network requirements. Alongside a high level of accessibility and watertight security, the University Hospital of Charleroi needs to guarantee its users a significant amount of bandwidth. Radiological research and other applications using medical imaging can place serious demands on the capacity of the network. New applications, too, such as the administration of electronic medical records require the continual transfer of very large multimedia files.

«A modern hospital network must be able to carry data, voice and in the near future video traffic simultaneously,» explains Jean-Pierre Binon. «The consolidation has given us some much needed breathing space in that regard. Now we are able to work on the management of electronic medical records that are allowing for a more interactive approach and more detailed information. Files will be stored in a centralised digital archive and will be available for consultation from any location by authorised personnel, such as the attending doctor, through our shared wireless network.

«Integration problems often stand in the way of simple management and sometimes even of the development of new applications,» warns Jean-Pierre Binon. «That is why we are striving for as much homogeneity as possible in the expansion of our ICT infrastructure. Apart from the usual price and quality considerations, this principle also influences our decision to work with certain suppliers. That doesn't mean that new equipment from Cisco isn't always subjected to a thorough series of tests. But such testing has failed to show up anything significant against the Cisco infrastructure up till now. I'm happy to say we have never had any problems with Cisco.»



NOMADS

Because the need for mobility is exceptionally high in a hospital environment, the University Hospital of Charleroi decided as early as 2004 to add wireless capability to its network. «Doctors in particular, but also nurses, are by definition nomadic workers,» says Jean-Pierre Binon. «By installing a wireless network and employing mobile devices, such as laptops and PDAs, we're looking to provide more efficient access to important medical information where it is most needed: at the patient's bedside.»

In the past, doctors doing their rounds had to make continual trips to a centralised office in search of information related to a patient's treatment or past medical history. Such trips resulted in a great deal of waste and inefficiency. By equipping the trolley with which doctors traditionally conduct their rounds with a laptop with wireless network capabilities, they now have continual and immediate access to patient data regardless of their location or the time of day. To achieve the same level of accessibility in the past, doctors would have had to carry complete hard copies of records with them, which, in practice, was obviously not always possible.

In the meantime, wireless network coverage has been installed in all wards of the hospital group. Though it has primarily been installed to assist in patient consultations, from 2006 it will also be possible to upload medical information, for example, concerning a patient's diet or body temperature, directly into the central information system from the patient's bed. For the purpose of such data capture, the University Hospital of Charleroi has also invested, among other things, in PDAs and Citrix software for mobile data access.

Finally, the hospital group is also looking, in time, to make a part of its wireless infrastructure available to the patients themselves and their visitors. Jean-Pierre Binon: «Our wireless network is made up of two perfectly separated sub networks. The first, a tightly secured professional network for our institutions' personnel, is connected to our intranet. Alongside that, we can create a public hotspot for our patients and their visitors without any significant additional cost. By way of additional service provision, we can then offer free wireless internet access for the duration of their stay or visit.»





PHASED APPROACH

The installation of Cisco's wireless network systems was done by the University Hospital of Charleroi itself. That approach is more the exception than the rule, as a thorough site survey normally needs to be performed before a wireless network of such dimensions, particularly one with voice communication capabilities, can be implemented. Usually, a specialised partner, such as Dimension Data, is called in to co-ordinate the implementation process. But because the University Hospital of Charleroi wanted to limit the use of the network in the short term to data transfer and because, above all, it concerned a rather complex environment, in which interference with medical equipment was to be avoided at all costs, Jean-Pierre Binon and his team opted to carry out the necessary analysis on their own. At the same time, they decided to construct the network selectively at first, based on the requirements in the different wards.

The University Hospital of Charleroi took out six months to study the new network technology in detail and to prepare for its actual implementation. That preliminary study consisted in a validation of the topography, preparing the network security and choosing the equipment. With regard to the latter, the hospital group opted for Cisco's Aironet Access Points providing wireless access to the network, while the CiscoWorks Wireless LAN Solution Engine (WLSE) takes care of its management. Finally, the Cisco Secure Access Control Server (ACS) covers network security, preventing, among other things, unauthorised access to the network.

Subsequently, the University Hospital of Charleroi opted for a gradual, phased implementation of the network. «The installation is an iterative process, in which we continually have to guard against any interference with medical equipment. As a result, we are still yet to install wireless network coverage in the operation theatres and we still continue to invest in the necessary technical know-how to analyse and monitor the step-by-step implementation of our network.

«Although we had a pre-existing fear or at least some doubts about the implementation and above all the security of a wireless network, the configuration of the Wireless Access Points or aerials and of Cisco's Wireless Security Server have all gone very smoothly, which was a very pleasant surprise. The learning curve was much shorter than we had anticipated at the start of the project, predominantly due to the excellent and above all very extensive documentation accompanying Cisco's products», concludes Jean-Pierre Binon.



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