

SANA AND CISCO CREATE 'HOSPITAL OF THE FUTURE' WITH A STATE-OF-THE-ART MEDICAL-GRADE NETWORK

Sana Hospital, Germany has chosen a Cisco Medical-Grade Network as the platform to create the 'hospital of the future'. It will enable the hospital to improve patient care and develop new revenues while supporting new ways of working and boosting efficiencies.

Customer

Sana Hospital

Industry

Healthcare

Business challenge

- Create a highly efficient, flexible workflow
- Support the integration of processes
- Reduce costs and increase productivity
- Provide a business and technology model for 'the hospital of the future'

Network solution

- One of the most advanced Cisco Medical-Grade Networks in Europe provides a single, converged infrastructure for voice, data and video communications and administrative, medical and patient applications and systems
- A Gigabit Ethernet core comprising Cisco Catalyst 6500 Series Switches supports a campus-wide Cisco wireless network enabling IP telephony using Cisco CallManager.

Business Value

- Improved patient care with access to accurate information
- 20 per cent increase in staff productivity with improved collaboration between teams
- A secure, scalable and flexible IP network supporting voice, video and data
- Improved Total Cost of Ownership (TCO) and reduced network operating expense through a converged network
- Brand differentiation in an increasingly competitive healthcare market

The Sana Hospital in Remscheid is an academic teaching hospital belonging to the Ruhr University of Bochum. It is also a regional hospital centre with 745 permanent beds in three locations, and 13 specialist departments treating over 21,000 in-patients and 20,000 outpatients. The hospital employs around 1,400 members of staff, including more than 150 doctors and over 600 nurses and other care staff.



"THE CISCO NETWORK PROVIDES US WITH A SOLID FUTURE-PROOF COMMUNICATIONS INFRASTRUCTURE THAT HELPS US TO OPTIMISE PROCEDURES AND CUT COSTS, WITHOUT ITSELF CREATING ANY UNNECESSARY OPERATING EXPENSES. IN 2005 WE ALREADY EXPECT TO SEE SAVINGS OF 20 PER CENT THROUGH INCREASED PRODUCTIVITY."

MICHAEL WILLMANN, HEAD OF IT, SANA HOSPITAL

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Medical standards in Germany are among the highest in Europe, but competition in the private sector is fierce and about to become even tougher with the announcement by government that it plans to close around 600 of the country's 2,200 hospitals within the next three years.

For healthcare providers like Sana-Kliniken-Gesellschaft mbH & Co. KgaA the challenge is to improve patient care while optimising efficiency and maximising opportunities to develop new revenues. To help it meet that challenge the organisation has turned to Cisco Systems to help it build the new Sana-Klinikum Remscheid GmbH.

Built alongside the existing hospital, the new building represents the 'hospital of the future,' delivering the highest standards in healthcare operational effectiveness, combined with optimum patient care and – even within the turbulent climate of continued restructuring in the German health service – economic success.

The hospital operators are investing around 60 million in the new building, which goes live in May 2005. The decision to work with Cisco was based on a number of factors, including the fact that the hospital had been successfully using Cisco equipment since 1999 and its engineers were very familiar with Cisco's approach to IP. The commercial envelope was also a good fit as the use of Cisco Capital enabled the hospital to spread its investment over six years, with the first instalment only due eight months after the project started. Most importantly, the hospital and Cisco shared the same vision of the role that a carefully designed, converged IP network can play in supporting healthcare.

"With the new building in the Burger Straße, the Sana Hospital Group proves that profit-orientated business management and first-class health care are not a contradiction in terms," explains Michael Willmann, Head of IT at the Sana Hospital in Remscheid. It promises to be the model for other hospitals in the group, showing how high-tech medicine and information technology can be imaginatively used to master the challenges in the health service.

Cisco Medical-Grade Network

The foundation of this vision is the creation of a 'Cisco Medical-Grade Network', a converged IP network that leverages Cisco's best practice and networking technologies to enable caregivers to provide the highest quality care possible, while improving business processes and increasing profitability.

A Cisco Medical-Grade Network 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.

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In practice, the Cisco Medical-Grade Network for Sana will mean digital X-rays reaching the ward via the hospital network in a matter of seconds. Manual handling of physical images will no longer be necessary. Archiving, previously an enormous task, will be reduced to a few mouse clicks. The software used throughout the hospital will in future merge the digital images with laboratory findings, results, therapy schedules and administrative data to form a multi-media medical record. "At the touch of a button, previous history, diagnoses and progress of treatment will be available anywhere in the hospital – on the ward, at reception or in the operating theatre," says Willmann.

So when patients are moved to another ward, no one will have to deal with paperwork any more. Doctors and nurses will also be freed up from the time-consuming routine involved in keeping records of the services provided. Software will also support sophisticated quality management processes, helping to guarantee the standard of medical and nursing care in the Sana Hospital.

"We are aiming for a highly efficient, extremely flexible workflow, where all processes are well integrated. What we want is to use the resources as efficiently as possible," says Willmann. This will also result in more streamlined treatment schedules. The most visible effect for the patient is that the stay in hospital will be reduced to the minimum necessary for medical purposes, without being detrimental to the patient's welfare. As fixed sums are charged per case in Germany (i.e. fixed rates per initial diagnosis), a reduction in hospital bed times is an important economic factor for hospital management.

A converged, wireless solution

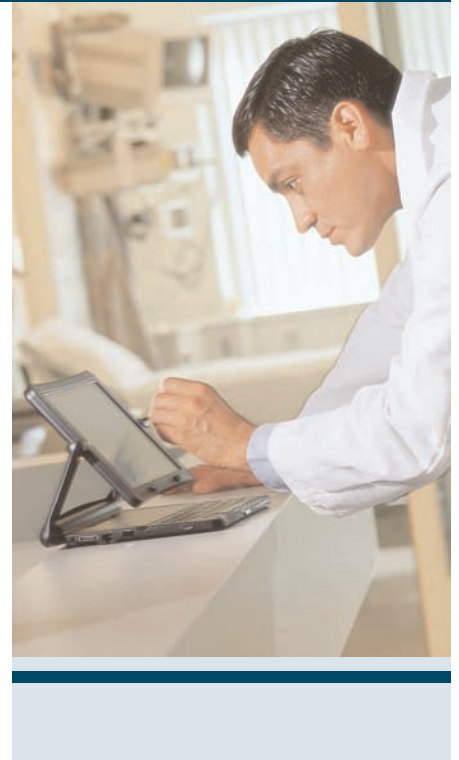
"In extreme cases, people's lives may depend on the availability of the communications infrastructure, so there can be no compromises in terms of the technological equipment," says Willmann.

The core of the network comprises seven Cisco Catalyst 6509 Series Switches, three with a Cisco 7600 Series Supervisor Engine 720 module, and four with a Cisco Catalyst 6509 Series Supervisor Engine 2 module, providing a secure backbone running at 100 Mbps with the ability to scale to multiple Gigabit speeds as traffic grows. Critically, the network has been designed to deliver 99.98 per cent availability.

Two of the switches are equipped with a Cisco Catalyst 6500 Series Wireless LAN Services Module (WLSM) and a Cisco Wireless LAN Solution Engine to form the core of a campus-wide wireless network served by 260 Cisco Aironet 1200 Access Points.

The modules are key components of the Cisco Structured Wireless-Aware Network (SWAN) framework, the industry's only enterprise class wireless and wireline switching system, enabling secure, easily managed unified networking deployments. The Cisco Wireless LAN Service Module provides advanced features such as advanced intrusion detection, automated resite surveys, warm standby redundancy and – importantly for Sana – network 'self healing'.

This is an advanced high-availability radio management feature that enables a Cisco Aironet Series access point to automatically adjust its cell coverage area to compensate for the loss of a nearby access point. If the Cisco Wireless LAN Service Module detects that an access point has failed, it compensates by automatically increasing the power and cell coverage of nearby access points. The self-healing solution minimises outage impact to wireless client devices and maximises the availability of wireless applications.



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Redundant Cisco CallManager Media Convergent Server 7835 provide IP telephony to a variety of Cisco IP telephones, while Cisco Unity delivers feature-rich unified messaging.

Transforming healthcare delivery

The ability to carry voice, video and data over the same network using Quality of Service to prioritise traffic, is a major feature of a Medical-Grade Network and one which is set to transform the way that healthcare is delivered, through the better integration of services and process as well as enabling totally new applications.

The network will help the hospital deliver a range of services equal to the best hotels in the world through 76 Patient Terminals that offer a range of multi-media features. The computer-based terminals feature a touch screen and can be used as a bedside telephone thanks to an embedded Cisco 7940 soft IP Phone. IP video services are also available with patients able to view a wide range of films through the terminal. It also provides high-speed access to the Internet for surfing or for keeping in contact through email.

Patients are able to pay for services either through their final bill or by purchasing a pre-paid hospital debit card. And because all services are supported by a single IP network and a centralised billing server, the card can also be used to pay for the entire range of discretionary services – from parking or borrowing a book, to meals in the cafeteria.

As well as providing a focus for entertainment, the terminals support the day-to-day care of patients and will make life easier and more productive for medical staff. In Germany, every bed is equipped with a light-signal call system used by patients to request attention. In five wards in the new building, the call system is integrated to a Cisco IP Phone 7970 in the nurses' ward offices. Integrating the light-signal system with the phone enables the nurse responsible to know immediately that she is needed in Room 11, Bed Number Two. And rather than go to the bedside to discover what the patient requires, the nurse can phone them to immediately answer their question or, for example, to save time by taking in a single journey what is required back to the patient. The same functionality also applies to the doctors' call button in the ward office.

Always in touch

The efficiency of the integrated system takes on a new dimension, however, because the alarm can also be transferred to one of 360 wireless Cisco 7920 IP Phones which medical staff can carry to ensure that they are always in touch. And the phones can be used not just to receive signals from the light-signal system. The patient terminals can even be programmed to show a series of buttons on touch screen XML display that a patient can use to specially request a drink or something to eat and so on – even if they are unable to speak, say while recovering from an operation.

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Around 400 users will enjoy the clarity and features of IP telephony when the network initially goes live, with the remaining 1200 users of traditional TDM (Time Division Multiplex) telephony migrating over to IP telephony in the future.

The wireless network also provides easy, secure access to the wealth of information on the hospital's SAP system and a wide range of services for medical staff on the move. Doctors can call up patient case notes or digital x-Rays and CT scans from centralised systems via their laptops or PDAs (Personal Digital Assistants). Fiddling awkwardly with cables to connect a laptop to the network will be a thing of the past!

Another important application on the network is an IP Gateway that provides two-way translation of signals from various systems and converts them to IP to better integrate them into the hospital's processes. The IP Gateway not only enables integration of the light-signal system, it also ensures that the hospital's facilities management and night porter security systems are supported and accessed over the network. Not only does this enable more efficient, centralised management, it opens up the possibility in the future of the group consolidating services from various hospitals to centralised contact centres.

Innovative new services

"The Cisco network provides us with a solid, future-proof communications infrastructure that helps us to optimise procedures and cut costs, without itself creating any unnecessary operating expenses. In 2005 we already expect to see savings of 20 per cent through increased productivity," says Michael Willmann.

The network enables the hospital to benefit from the other proven benefits of a converged network. The ability to consolidate two or more distinct network operations within an organisation naturally leads to cost reductions through the more efficient use of employees, technology, property/facilities (technology housing) and leasing contracts, as well as dealing with fewer vendors. In addition, having a single network operation allows better visibility of future costs and requirements for technology enhancements.

New services are already being planned. Additional video security will be made possible on an ad hoc basis over the network by using low-cost IP webcams to monitor sensitive areas such as baby wards. There are even plans to trial wireless RFID (Radio Frequency Identification) chips to protect expensive equipment, or even to alert staff when a patient wanders away from a ward.

With the ability of its Cisco Medical-Grade Network to support every aspect of its operations both now and in the future, for Sana Hospital and its patients the prognosis is undoubtedly good.





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