



# INTELLIGENT NETWORK WITH MULTIMEDIA FOR HOSPITAL SCHWARZWALD-BAAR KLINIKUM

Entertainment, communications and work, all managed intelligently  
in an innovative network, as a prime example of a multimedia hospital.

A focus on service and comfort is becoming increasingly more important at medical facilities. Patients not only expect outstanding medical care, but also multimedia options for entertainment, service and telephony for the duration of their stay. While the new, ultra-modern hospital Schwarzwald-Baar Klinikum in Villingen-Schwenningen, southwestern Germany, was under construction, T-Systems implemented an innovative, all-IP end-to-end solution for LAN, Wi-Fi and voice that is currently unmatched anywhere in Germany – with a current 10,000 active supplied switch ports and more than 6,900 LAN devices for the 750-bed facility. It integrates multimedia with entertainment, communications and service. Patients can use touchscreens at their hospital beds to watch TV, hear radio, surf the Internet and call service staff, among other features. Like at a hotel, they can use fixed-line phones, as well as their own smartphones and notebooks with Wi-Fi. Billing is managed through prepaid chip cards, which can be topped up at any of 12 card machines. In addition, the solution has a modular structure, making it open for future enhancements – such as patient self-services and providing information during medical rounds and nursing care – as well as for potentially lucrative paid services.

## AT A GLANCE

- A modern multimedia system for patients with integrated VoIP telephony, Wi-Fi and Internet access, directly from the bed
- 705 LCD touchscreens, some in combination with 36 flat-screen TVs, depending on the room category
- 705 ergonomic telephones, designed for the specific hygiene requirements, integrated in the multimedia systems
- 800 IP and 860 Wi-Fi phones with voice-over-IP for hospital staff
- Exhaustive coverage with 1,200 Cisco access points, powered by PoE
- Chip card-based billing system with display of credit
- Integration with the hospital information system for efficient process support for the hospital organization, which reduces the workload on staff
- Increased comfort for patients during their stay in hospital
- Modular, easy to expand structure for future service-oriented applications



**HEALTHCARE SOLUTIONS**

# THE REFERENCE IN DETAIL

## THE CUSTOMER

In the summer of 2013, Schwarzwald-Baar Klinikum left its two existing hospital sites and moved to its new building in Villingen-Schwenningen, which was built over a period of four years. The ultramodern central hospital is the most advanced in the region. The academic teaching hospital of the University of Freiburg, its 2,800 employees make it one of the largest 80 hospitals in Germany. It provides care to more than 46,000 in-patient and 100,000 outpatient cases each year. Schwarzwald-Baar Klinikum stands for highly developed medical skills, generally at a university level, highly specialized and future oriented equipment, and outstanding patient comfort.

The 750 hospital beds are distributed among 22 standard care stations, 58 ICU beds for adults, 14 pediatric ICU beds and care for short-term treatment stays. The surgery center features 15 operating rooms on a dedicated floor.

## THE TASK

The hospital wanted an intelligent, IP-based campus network. Its conventional desktop phones and all cordless phones for patients and staff had to be integrated. The VoIP environment also had to cover requirements for patient entertainment and the billing system, using personalized patient cards. Since the network would transport personal, medical and administrative data, the security requirements were high. Designing the broadband aspects of the network, with its complex switching and routing, was a special challenge, for example, to ensure that several hundred patients could watch a World Cup match at the same time.

## THE SOLUTION

T-Systems, working together with Deutsche Telekom Technical Service (DTTS), designed a powerful network infrastructure that meets the strictest security requirements. The newly designed all-IP solution integrates fixed-network and Wi-Fi telephony, combined with patient entertainment. 1,200 Cisco access points ensure that every square inch of the hospital has reception. Due to the incremental nature of the installation and configuration process, Wi-Fi illumination was only possible separately by each floor and department, with subsequent connection. T-Systems trainees were deployed as phone testers. The network not only connects the 705 user-friendly LCD touchscreens for the entertainment program, including TV streaming and gaming; it also integrates 800 IP telephones, 860 Wi-Fi telephones, 36 flat-screen TVs, all PCs, the medical devices and even the automatic window blinds. In a further

innovation, the billing system is also integrated. It consists of a server, the software, the card machines and an interface to the hospital information system. As part of the admissions process, each patient receives a printout with a bar code. When credit is purchased, the machine generates a personalized patient chip card, from which the price of purchased services is debited automatically. Should any problems occur, T-Systems has set up specific hotlines for entertainment, billing, WAN, LAN etc. The hospital's two separate data centers ensure secure storage of the data, which can only be retrieved by authorized personnel through secure access.

## THE CUSTOMER BENEFIT

With this innovative solution, the southwestern German hospital has positioned itself as a progressive, extremely patient-friendly service provider. Patients can entertain themselves in their hospital beds with TV, radio, games and Internet. TV shows can be viewed time-shifted, with fast-forward and reverse. The service call lets patients order additional services outside of the medical spectrum, and patients can also select their lunch menus from the touchscreen. Of course, patients can also use their own smartphones, tablet PCs and laptops. The system currently supports two languages, English and German; additional languages are possible. There are many benefits for day-to-day hospital operations, as well: previously, they had to hire an external technician for every change to the phone system; now, administrators at Schwarzwald-Baar Klinikum can manage internal moves and changes themselves with a minimum of effort. In addition, the IP equipment is cheaper to operate and maintain than conventional phone systems and the workload can be distributed among staff more effectively. The service call, for example, is a non-medical call and pages an assistant instead of a duty nurse, who is freed up to concentrate on medical duties.

This T-Systems solution not only makes patients' time spent in hospital more entertaining and more service-oriented, but also simplifies administration processes. Furthermore, it provides a sturdy foundation for additional features and services.

In one future scenario, for example, doctors can also benefit from the comprehensive networking. They will no longer need to take any records with them on their hospital rounds. Instead, the latest patient data can be called up quickly and securely on a PC or notebook, any time and anywhere in the hospital. X-ray images and lab results can be displayed and discussed with patients directly at their hospital beds.

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