



## **WLAN Solution for the Mobile Ward Round in the St. Bernhard Hospital in Brake**

IP Access

**WLAN**

ITC

VoIP

## PROJECT - PROFILE

**Project requirements:**

WLAN solution for the mobile ward round to reduce the costs for the patient ward round

**Concept / solution:**

Mobile ward round via WLAN access

**Partner:**

convergence-solutions GmbH

**Products used:**

FEC WLAN access points and antennas

**Total implementation period:**

Eight months

**Pilot customer:**

St. Bernhard Hospital in Brake



**The St. Bernhard Hospital in Brake has implemented a WLAN infrastructure in the sense of a patient-oriented and at the same time cost-effective mobile ward round solution, which permits access to the electronic patient record (EPR) any time.**

### Unleashed Ward Round

Since November 2003, the St. Bernhard Hospital in Brake at the Unterweser (Lower Weser), a hospital with a basic accommodation capacity of 126 beds, has been having experience with the notebook-equipped ward round carriage. A WLAN connection makes it possible to access the patient's file during the ward round at any time and any place.

Since the change of the hospital information systems (IS) from pure billing systems to complex, medical information systems, the vendors of information systems

continue presenting solutions how to make the stored information directly available at the patient's bedside without media discontinuity. Currently, the widest-spread solutions surely are Palm-based Personal Digital Assistants (PDAs) and tablet PCs.

Both alternatives, however, were not appropriate in the case of the St. Bernhard Hospital: PDAs were not selected because they were lacking program interfaces to the IS, LIS (laboratory information system), and RIS (radiology information system). Tablet PCs, in comparison, were simply too expensive.

Initially, the director of the data processing department, Christian Karnatz, would not be won over for a notebook solution, either: "Given an accumulator runtime of 2 to 4 hours and a maximum number of several hundred recharging cycles, it was predictable that several expensive substitute accumulators would have to be bought for each notebook."

The mobile ward round in hospitals requires direct access to the centrally stored EPR: The WLAN solution of FEC fulfills all requirements and protects sensitive data.

## Wireless LAN vs. DECT and Bluetooth

The engineering company which was also consulted for the planning of the wireless network found the solution: small, dry cell batteries which are designed for several thousand recharging cycles and, moreover, offer a warranty of 5 years. In contrast to the notebook accumulator, these batteries provide energy for several hours-enough for any ward round.

To avoid having to carry the notebooks during the complete ward round or to lay them down at defined places, the ward round carriages had to be retrofitted. The dry cell batteries were stored in a small compartment and the required cables were laid in such a way that they did not cause any hindrance for daily work.

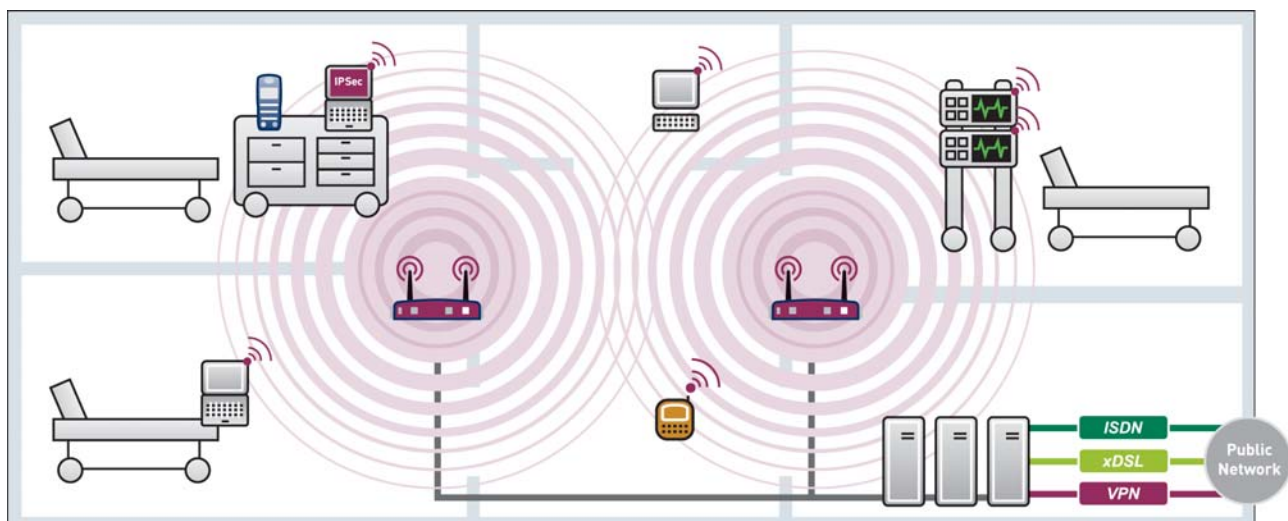
Prior to the "installation" of the notebooks on the ward round carriages, the accumulators were removed so that they would not be damaged in the course of the continuous recharging processes. The calculators are protected against theft by means of so-called Kensington locks and against dropping from the carriage via Velcro fasteners. If a notebook is stolen in spite of these security measures, the confidential

patient data will not be endangered. The information systems used exclusively are client-server applications, which means that merely the programs required to access the patient data are installed on the notebooks. The patient data sets themselves, in contrast, continue to be safely stored on the servers. Files which are temporarily created on the notebook are automatically deleted each time the notebook is shut down. The comprehensive security features implemented in the artem Access Points prevent the access by unauthorized third parties over the WLAN.

In contrast to many Palm-based applications, the data sets are not only to be made available offline on the notebooks, but the direct access to data on the servers is also required. Due to the rapid development on the wireless technology sector, various alternatives were considered. The existing DECT wireless network of the PBX quickly proved to be inappropriate-the data capacity was simply too low. Due to the insufficient bandwidth, Bluetooth was also out of the question. On the wireless products market, the solution was finally discovered.



"Now I can access the current diagnostic data directly at the patient's bedside. I can book appointments for examinations made in the functional units directly and communicate them to the patient in a binding form," says Dr. Alexander Poppinga, medical controller at the St Bernhard Hospital.



## The artem WLAN Technology of FEC Lead to the Breakthrough

In the course of the past years, Wireless LANs according to the IEEE 802.11x Standard has been gradually gaining predominance on the market. There are differences both in terms of the speed (the most common variants are 802.11g; 54Mbps, as well as 802.11b; 11Mbps) and in terms of the used hardware components (for instance with regard to the coverage achieved with external antennas). During tests carried out on a pilot station with products of different vendors it initially turned out that even with external antennas of access points installed under the ceiling no optimum receive properties could be provided, so that it would not have been possible to do without an additional external antenna at the notebook.

A recommendation of the technology consultants of convergence-solutions GmbH (CS) led to the breakthrough: The selected Wireless LAN products of Funkwerk Enterprise Communications-arterm Access Points (APs) and antennas-were used to implement a wireless network which offers the access to the data processing network by means of two or three APs per ward. The sending capacity of the antennas is so high that the integrated Wireless LAN cards of the notebooks suffice for the data access.

As notebooks, products with Centrino chips and 15" monitors are used in the St. Bernhard Brake Hospital. The director of the data processing department, Karnatz, asserts: "The decisive parameter in favor of the Centrino chips was the low generation of heat and noise, a point to be considered in the case of notebooks with desktop CPUs. As the monitor diagonal, at least 15" were

required, since most applications used in our hospital have been optimized for a resolution of 1,024 x 768. A welcome side effect for the envisaged application was the integration of Wireless LAN into the Centrios."

## The Aim is the Paperless Hospital

The rationalization effect via the access to EPR convinced the managing board to provide means for the infrastructure of mobile ward round carriages even in times of strict saving measures. Dr. Poppinga explains that: "In former times, we could only draw on laboratory findings of the previous day to make diagnosis or therapy decisions during the ward round. The nurses sorted these findings in into the patients' files prior to the ward round and entered instructions into the electronic information systems at the workplaces in the ward after the ward round. Now, I can access the current diagnostic data directly at the patient's bedside. I can book appointments for examinations made in the functional units directly and communicate them to the patient in a binding form."



"Given time savings of 15 minutes per day on the health care sector, the return on investment for the technology investment is reached after approximately 1 year," says Christian Karnatz, director of the data processing department of the St. Bernhard Hospital.



The time savings during the preparation and postprocessing of the ward round alone suffice to justify the investment in the context of a profitability assessment. Considering, moreover, that due to faster therapy decisions-taking patients can be discharged sooner and that further examinations can be avoided because of the existence of up-to-date findings, it is obvious why Christian Karnatz as a controller opted for the fast introduction of the technology in the hospital: "We have invested approximately € 3,000 into the wireless network infrastructure of the two internal medicinal wards. Fortunately, the radio signal also offers the surgical wards located above the internal medicinal departments the access to the network. If you calculate € 1,200 per notebook, 4 wards can be equipped for less than € 8,000. Given time

savings of 15 minutes per day on the health care sector, the return on investment for the technology is reached after approximately 1 year."

After fulfilling the technical requirements, the decision-takers in the St. Bernhard Hospital in Brake are now pondering upon taking the next step in the direction of the paperless hospital, for instance by means of a digitalization of the nursing documentation. The time when the plan of operations was taken to the ward round along with the notebook will soon belong to the past.



"Funkwerk is a first-class address for WLAN solutions. For the duration of the complete project, FEC proved once again that they are a reliable and competent partner," says Jürgen Rogall, managing director of convergence-solutions GmbH.

## Portrait: convergence-solutions GmbH

**Competence:** Our services start with an analysis of your corporate structure. All communication levels, such as voice, data, e-business, CRM, infrastructure, and security are considered. Our team looks back on many years of experience in the information technology and telecommunications sectors.

**Partnership:** Under consideration of your requirements we will develop the ideal solution for your company as your reliable partners. Here, the strategic aims of your company will always be in the focus under consideration of the organizational parameters given.

**Innovative Course of Action:** convergence-solutions GmbH helps you introducing new technologies. This allows your company to offer and use new, innovative products and services more quickly and under consideration of your specific requirements.

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