# JOHANNES GUTENBERG UNIVERSITY IN MAINZ, GERMANY

## HEALTHCARE

# A Network Grows to Meet Evolving Healthcare Requirements

## EXECUTIVE SUMMARY

### Technology Challenge

Deploy a highly optimized, high-performance network to accommodate bandwidth and traffic growth while meeting regulatory requirements

### Solution

- Implemented a new backbone with 7 Brocade® BigIron® chassis and 96 edge devices
- Deployed 48 Brocade FastIron® Series edge switches and established 120 virtual LANs
- Planned upgrade to 10 Gigabit Ethernet (GbE) using 5 BigIron Series switches and 23 FastIron devices
- Improved overall network efficiency and positioned for future growth

### Benefits

- More cost-effective GbE network
- Shared access to centralized patient data
- Digital image transfer to internal and external users
- Easy adoption of new applications
- Increased number of connection points, encouraging user adoption
- Improved overall network efficiency and positioned for future growth

The medical clinic associated with the Johannes Gutenberg University in Mainz, Germany, took a multi-phase approach to upgrading its network. The clinic has invested more than $1.5 million in the network and today has a high-speed Gigabit Ethernet backbone that supports current doctor, staff, and patient use—as well as future network growth.

With the advent of new healthcare applications to improve care and operations, the clinic staff realized that its network would not support the ever-increasing traffic load. And restructuring in Germany's health sector would soon cripple the network. Additional computer links, more bandwidth, and clinic-wide access to stored digital data were necessary to continue serving the clinic's population. The medical clinic needed a highly optimized, high-performance network to accommodate that growth.

In response to these demands, Dr. Hanns Peter Fritsch, the clinic's network group leader, and his team began installing a new communications infrastructure with Fiber Distributed Data Inter-face (FDDI) and Asynchronous Transfer Mode (ATM) links. Fritsch planned to migrate the network to a Gigabit Ethernet backbone with future virtual LAN support when the technology was more established.

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## PHASED APPROACH RESULTS IN UNPARALLELED PERFORMANCE

When Fritsch felt that Gigabit Ethernet technology would support the hospital's growing needs, the organization undertook another network upgrade. The migration to Gigabit Ethernet would allow the clinic to take advantage of the more cost-effective Ethernet equipment and to introduce easier network management. Fritsch wanted 7 powerful, modular backbone systems with redundant management modules and 96 edge switches. Fritsch selected Connect Kommunikationssysteme, a local Mainz VAR, to build the Gigabit Ethernet backbone and the first of 120 planned virtual LANs using equipment from Brocade.

Today the clinic network consists of seven BigIron Series switches: six interconnected in a star shape using multimode fiber optics and the seventh used for testing and as a spare device. All system links feature a redundant configuration; Open Shortest Path First (OSPF) manages dynamic routing, load balancing across all available trunks, and seamless failover in the event of a fault. Each BigIron chassis currently uses only half the available interfaces, providing the clinic with sufficient capacity for future expansion.

# BROCADE

When the hospital was ready to move forward once again, Fritsch began the second phase of network improvement, which included adding equipment to support more virtual LANs. Again, he selected Connect Kommunikationssysteme and Brocade equipment, based on their price/performance advantage and rich feature set.

Fritsch and Connect Kommunikations-systeme installed 148 FastIron Series edge switches. According to Fritsch, a key factor in his decision to use Brocade systems is their support for sFlow at wire speed. Out of the box, the Brocade equipment can deliver all the raw data needed by the clinic's critical applications, such as accounting, billing, intrusion detection, capacity planning, and security analysis.

Recently, the clinic decided to upgrade the backbone to 10 GbE and the IT team has again selected Connect Kommunikations-systeme and Brocade. Fritsch chose an additional 23 FastIron Series switches and 5 BigIron Series switches to make up the new 10 GbE backbone.

## THE NETWORK AS A FOUNDATION FOR IMPROVED CARE

Today the Gigabit Ethernet network spans the entire university campus and users can connect from anywhere. With so many places to connect to the network, it has been easy to install and operate video monitoring, access verification, and fire detection systems over the network. The high-performance network will accommodate future plans to support Voice over IP (VoIP) in the clinic.

Users have adapted to the enhanced network without skipping a beat. "The network has been so warmly welcomed by our users that they're registering new applications almost every day," Fritsch says. In fact, the upcoming migration to 10 GbE is becoming urgent as bandwidth demand continues to increase. Clinic staff, administrators, and medical systems depend on the network more extensively and the frequency and size of the digital images that are being transferred in the clinic and to external clinics and doctors have also increased.

### WHY BROCADE

- Proven solution
- Support for high-bandwidth applications
- sFlow support at wire speed
- Ability to accommodate future growth

Because the network is in such demand, Fritsch and his team are considering additional capabilities, such as server load balancing and application switching. The network upgrade has been extremely successful, according to Fritsch. More users are accessing the network, using more and different applications with improved network performance. Doctors and staff increasingly rely on the network and have gained efficiencies in many aspects of their work—internally and externally.

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