

FRANKFURT UNIVERSITY SUPPORTS COLLABORATION, RESEARCH, AND TEACHING WITH EX SERIES ETHERNET SWITCHES



Industry: Education

Challenges:

- Reliably deliver bandwidth hungry multimedia applications over a network serving a large, widely distributed university campus
- Manage the security issues of a large, frequently changing user population
- Provide a cost-effective platform for future growth

Selection Criteria: Using Juniper Networks testing labs, the university became the first European organization to rigorously test Juniper Networks EX Series Ethernet Switches, determining that the switches supported the security, high port densities, and sophisticated routing functionality needed.

Network Solution:

- EX4200 Ethernet Switch
- MX480 Ethernet Services Router
- M Series Multiservice Edge Routers
- SSG Series Secure Services Gateways
- ISG Series Integrated Services Gateways
- NetScreen Series Security Systems
- JUNOS Software

Results:

- Improved availability, reliability, and response times for network users
- Reduced switching and routing complexity and total cost of ownership with the single JUNOS Software operating system
- Lowered energy costs and carbon production thanks to the energy efficient EX Series Ethernet Switches
- Delivered a flexible, scalable solution that will accommodate the university's future growth

Frankfurt University is one of the largest in Germany, with approximately 35,000 students and almost 4,000 staff spread over four main sites across the city. Lively, urban, and cosmopolitan, it provides a wide range of higher education and research opportunities, with an emphasis on leveraging the synergies delivered through interdisciplinary research and study.

In order to continue delivering top quality education and attract high caliber students and staff, a robust, reliable, and secure LAN is critical to Frankfurt University. The network enables efficient communication and collaboration between students and staff, as well as supports new ways of teaching, learning, and delivering services. The university is committed to adopting the most innovative new technologies in order to optimize the value and impact of its IT infrastructure.

Challenges

Enhancing Learning Environments

With a large number of students and faculties spread across a geographically dispersed campus, the university's LAN infrastructure needs to reliably meet the needs of a diverse collection of bandwidth hungry applications. The university has approximately 24,000 data ports across its campus and, having just switched to VoIP for its telephony needs, around 7,000 voice ports. The delivery of latency and delay sensitive traffic such as video conferencing must be managed in parallel with less demanding traffic such as email.

"We wanted to move away from the ATM connections we had on our network and upgrade to intelligent switches that provide sophisticated routing functionality," explained Hans Zoeller, head of networking at Frankfurt University. "In order to simplify the management of our system, we were also searching for one vendor that could meet most of our requirements and provide us with a cost-effective platform for future growth."

The university also has exacting security needs. Along with a requirement for 802.1X port-based authentication, the large, frequently changing population of users accessing the university's network through a range of devices multiplies potential vulnerabilities.

Selection Criteria

Sophisticated Switching, Simple Management

When Frankfurt University wanted to upgrade its network with intelligent switches capable of handling some elements of network routing, Juniper Networks® gave the university access to its testing labs. The university became the first European organization to rigorously test Juniper Networks EX Series Ethernet Switches,

determining that the switches support high port densities and sophisticated routing functionality. The EX Series switches also met the customer's demanding security needs, offering levels of functionality that the university could not find with other vendors—for example, authentication and accounting with 802.1X. The fact that the solution only needed one operating system, Juniper Networks JUNOS® Software, to manage its network infrastructure switches and routers, was another major plus for the university.

“By gaining access to the EX Series switches at the Juniper Networks labs, we were able to thoroughly test them and prove that they support high port densities and sophisticated routing functionality,” says Zoeller. “The Juniper switches also met our demanding security needs, offering levels of detail that the university could not find with other vendors. Another thing we liked about the Juniper Networks solution was that it runs a single operating system, JUNOS Software, across the entire switching and routing infrastructure. This makes managing the network far simpler and more cost effective.”

“Juniper Networks products are easy to install and manage, plus we only have one operating system, which is extremely cost effective. We don't need to employ or train experts on several different systems. This reduces our expenses compared to alternative solutions.”

Hans Zoeller
Head of Networking, Frankfurt University

Solution

Move to Fiber Optics

Based on the results of its tests, the university chose Juniper Networks as one possible strategic vendor for its future network infrastructure projects and became the first EX Series switch customer in Europe. Over the last year, an Juniper Networks MX480 Ethernet Services Router has been installed at the core of the network with around 170 fiber-based EX4200 Ethernet switches with Virtual Chassis technology deployed within university buildings.

“The implementation went almost without a hitch,” confirms Zoeller. “Any minor glitches were solved swiftly and professionally by our Juniper Networks team.”

Juniper Networks has worked in close partnership with the university since its initial interest in the EX Series switches. Zoeller says: “The members of our small networking team are very knowledgeable, but when we encounter challenges, we

have excellent support from the experts at Juniper Networks. They always respond very quickly and competently to our questions. This open, collaborative approach does not just apply at a technical level; if I need to discuss business issues with my account manager, he's always available and willing to get involved.”

The university is currently building fiber optic connections from its core network to its new individual buildings; eventually a fiber ring will encompass the entire campus. The EX4200 Ethernet switches within the buildings have a fiber uplink, with copper host ports for connecting to the desktop. Fiber is cheaper and requires less space for cabling within buildings, as it can cover greater distances compared to copper wiring and offers the option to concentrate the switches bringing connections to the building in a single room, making them easier to manage. Zoeller believes he can break even on the installation costs of fiber optics within just 18 months.

Results

Cost and Carbon Efficient Performance

With its new MX480 Ethernet Services Router and EX4200 switches in place, staff and students at the university are already seeing improvements. “With Gigabit access ports and 10-Gigabit uplinks between buildings, we've got far better throughput and bandwidth on our network,” says Zoeller. “This translates into improved response times, availability, and reliability for our users. Unplanned downtime is virtually unknown now, and as we build up the fiber optic ring, we'll be reducing our risk of connection problems even further.”

There are also benefits for the university's networking team. Zoeller continues: “Juniper Networks products are easy to install and manage, plus we only have one operating system for our switches and routers, which is extremely cost effective. We don't need to employ or train experts on several different systems. This reduces our expenses compared to alternative solutions.”

The university is expecting cost benefits in other areas, too. The EX4200 Ethernet Switch is very energy efficient, physically compact, and requires less cooling than conventional switches. As a result, EX4200 switches free up valuable space within buildings, cut energy and installation costs, and help reduce the university's carbon footprint.

As an established, respected organization, Frankfurt University is continuing to extend the facilities and opportunities it offers to its students. Building construction is under way to accommodate improvements and growth. With its high-performance network based on the Juniper Networks Ethernet solutions, the university has an infrastructure in place that is flexible and scalable enough to accommodate current and future expansion.



Next Steps

Leading by Example

Further improvements are already being built into the network. The university is starting to migrate all of its Juniper Networks M Series Multiservice Edge Routers to Juniper Networks MX Series Ethernet Services Routers to gain additional service flexibility. It is also planning to upgrade its firewalls and boost its security features by installing Juniper Networks SRX Series Services Gateways—a security device which also runs on JUNOS Software. Zoeller is particularly pleased that this increase in security will come without any loss of system performance. “We will have a high-performance switch, router, and security deployment which runs on a single source operating system,” he says.

“We have close connections with other universities and educational establishments in our region of Germany and they are very interested in what we’ve achieved with our network. Several are already considering implementing similar network routing and switching products. I’ve even had interest from a university in the Eastern states of America,” concludes Zoeller.

About Juniper Networks

Juniper Networks, Inc. is the leader in high-performance networking. Juniper offers a high-performance network infrastructure that creates a responsive and trusted environment for accelerating the deployment of services and applications over a single network. This fuels high-performance businesses. Additional information can be found at www.juniper.net.

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