Success Story

Zyxel Brings Wireless Innovation to Tomorrow's Innovators

INDUSTRY — Student Housing

CUSTOMER — ETH Zurich

REGION — Switzerland

SOLUTIONS — Zyxel Wireless Solution

Overview

Challenges

- Overcome signal degradation problem caused by the numerous walls in a student dorm
- Implement effective user and bandwidth management
- Satisfy stringent security, switching, and high-level of traffic and WiFi access requirements

Solutions

- Zyxel Wireless Solution

Benefits

- Intra-BSS traffic blocking keeps WiFi users invisible from each other
- IP Source Guard and DHCP snooping reject rogue servers
- Provide the ability to monitor and regulate network usage and access in real time
- Potential bottlenecks can be detected and revolved before causing havoc

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Background

For a university in a country of just 8.4 million people, ETH Zurich punches well above its weight.

Established in 1855, the Swiss Federal Institute of Technology, as it's also known, is a giant of science and technology. Its students, professors, and alumni have racked up 32 Nobel Prizes since the award was founded.

But living space affordable enough for students is rare in Zurich. To meet the housing needs of the next generation of scientists and academics, ETH built a new housing complex for its Hönggerberg campus on the outskirts of the city. Dubbed Student Village, it's located right next to the campus and can accommodate 500 residents.

Challenges

Large structures like student dorms and housing complexes are notoriously tough to network, whether it needs to be wired or – as in ETH's case – wireless. More rooms means more walls, and every wall takes a huge bite out of signal strength. To ensure the project rolled out smoothly, ETH listed detailed security, switching, and WiFi access specs during the planning stage. Its goal: stable and secure wireless connectivity in every residential room.

The facility includes the implementation of modern network infrastructure that can overcome the challenges posed by student users. The network was jointly planned and implemented by local Zyxel partners Tesag AG and Studerus AG, who worked closely together from the project's inception. The partners studied the project's requirements and developed their basic approach to satisfying every one of the client's needs.

Solutions and Benefits

Cooperation between the partners as well as with the building developers remained close throughout the project. This included WiFi measuring and testing, and making the necessary corrections. A comprehensive security and bandwidth management plan was developed. In the end, a total of 100 WAC6503D-S 802.11ac Dual Radio Smart Antenna access points, more than 1,000 XGS3700-48HP switches, a USG1900 firewall, and NXC5500 wireless LAN controllers were deployed.

A network with such a variety of users requires stringent safety measures. This includes intra-BSS traffic blocking to prevent clients from seeing each other over the WiFi network. Other key safety measures such as IP Source Guard and DHCP snooping ensure that clients are assigned IP addresses only if their DHCP servers are trustworthy; invalid requests are rejected.

Such precautions prevent routers installed by students from being used as DHCP servers. Plus, with the help of ARP inspection, a student can't assign a fixed IP to a client.

Just as crucial on such a large-scale network is genuinely effective monitoring. By applying a Zyxel network-monitoring solution, real-time information for the network is continuously collected. This allows uninterrupted monitoring of device availability and utilization as well as measurement of actual bandwidth usage. Whenever lag, a mechanical malfunction, or other failure is detected, a message is sent to ETH's IT administrator or other dedicated maintenance personnel. Furthermore, a ccumulated historical data enables the long-term review of the network's overall status and traffic. Potential bottlenecks and other problems are simple to detect early and deal with efficiently.

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Products Used

USG1900 • Unified Security Gateway

- Next Generation Firewall for medium- and large-sized businesses and campuses
- Anti-malware protection with firewall, Anti-Virus, Anti-Spam, Content Filtering 2.0, IDP, next-generation application intelligence, and SSL inspection
- Robust SSL, IPSec, and L2TP over IPSec VPN connectivity and VPN High Availability (HA)
- Unified security policy
- Cloud Helper makes firmware upgrades a breeze
- Device HA Pro ensures smart handover

NXC5500 • Wireless LAN Controller

- Centralized WLAN management and auto provisioning
- Manages up to 1,024 APs with granular access control
- ZyMesh simplifies complex, inconvenient cable-heavy WiFi deployments
- Comprehensive features for WLAN performance optimization and always-on WiFi connectivity
- Wireless LAN performance optimization via dynamic channel selection and load balancing
- QR code-based guest authentication
- Zyxel One Network supported

XGS3700-48HP • 48-port Gigabit L2+ PoE Switch

- Full Layer 2 feature set with Layer 3 features including static routing, policy-based routing, VRRP, and ECMP support
- Four 10-GbE SFP+ uplink flexibility
- High PoE power budget of up to 1000 W
- Hot-swappable power supply
- Internal redundant power supply design
- Physical stacking up to eight units and 384 Gigabit ports through two standard 10-GbE SFP+ ports

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- Zyxel smart antenna with more than 700 optimized antenna patterns provides breakthrough performance anywhere
- Ideal for high-density and interference-laden indoor environments
- Advanced IEEE 802.11ac offers combined data rates of up to 1.75 Gbps
- Industry-leading Rx sensitivity as low as -102 dBm
- AP Flex™, DCS, and tool-less bracket design for streamlined deployment

About Zyxel Communications

Focused on innovation and customer-centricity, Zyxel Communications has been connecting people to the Internet for nearly 30 years. Our ability to adapt and innovate with networking technology places us at the forefront of creating connectivity for telcos and service providers, business and home users. Zyxel is building the networks of tomorrow, unlocking potential, and meeting the needs of the modern workplace — powering people at work, life, and play. Zyxel, Your Networking Ally.