ZyXEL

Success Story

ZyXEL Helps University Library Step Up to 802.11ac Wi-Fi with Reduced Management Overhead

"ZyXEL has supported us from beginning to the end, helping create a comprehensive solution for our library. ZyXEL determined our needs and significantly upgraded our network. Implementing a solution has led us to improve the quality of our network and the services we offer students, faculty, and guests in a cost-effective way."

Dr. Yu-Ze Kuo
Network System Manager of
IT Service Center, NCTU

Overview

Customer Name
National Chiao Tung University
Hao-Ran Library & Information Center

Customer Industry
Education

Challenges
• Upgrade outdated network infrastructure
• Improve network stability
• Provide scalable future-proof solution
• Signal strength must be evenly distributed over large area covering multiple floors
• Overcome potential signal interference from bookshelves

Solution
• 802.11ac Dual Radio Unified Pro Access Point

• Wireless LAN Controller
• Unified Security Gateway
• 24-port Gigabit L2+ PoE Switch

Benefits
• Seamless signal coverage and connectivity for public, students and staff
• Improved security and stability via multiple SSIDs enabling separate networks and access privilege
• Suitable bandwidth for e-learning activities
• Seamless integration with exiting library's guest login system for easy management and tracking
• High performance and scalable wireless infrastructure for easy expansion

Background

National Chiao Tung University (NCTU) is one of Taiwan's leading public research universities, located in city of Hsinchu. The university offers more than 100 degree programs through the nine academic colleges on campus, and is traditionally known for its education in the sciences and engineering. NCTU's Hao-Ran Library & Information Center, which was officially opened in 1998, contains a print collection as well as digital information resources. Not only does it provide services to nearly 18,000 faculty and students, it is also open to the general public.

NCTU Library occupies a spacious nine-story building of approximately 32,000 square meters. It has a maximum book storage capacity of 1.5 million volumes, and contains 1,200 study desks and a conference hall, which accommodates large-scale events and features seating for 380 people. It is a multifunctional library which accommodates technology, art, and leisure activities.

Challenges

The NCTU library's outdated and outmoded network infrastructure was hampered by poor bandwidth capacity, which often led to issues such as difficulty in connecting the library's network (SSID) or trouble with downloading electronic journals. In addition, with the average number of online users exceeding 300 people at any given time, the former network's 2.4GHz wireless Internet connection proved to be insufficient as both the number of users and devices increased. Because of that, the IT management had to spend excess time and effort to handle network faults and service complaints.

Dr. Yu-Ze Kuo, the network system manager for the IT Service Center at NCTU, said, "With the increasing demand for bandwidth created by mobile devices and on-line users, the performance and reliability of the network steadily declined. We needed to upgrade with a future-proof wireless solution to meet the diverse academic and research needs of a leading university, as well as to reduce the workload for our IT management team."

Because the library occupies a large area, the new wireless signal must not only extend to multiple levels — from first to seventh floor — it also needs to overcome wireless signal interference from barriers such as bookshelves.

ZyXEL stepped in to provide a comprehensive solution that included a new wireless network that was future-proof and scalable to meet new challenges as they evolved.

Solutions and Benefits

After conducting onsite surveys, ZyXEL experts customized a scalable, integrated wireless network solution for the library. To provide wireless signal coverage, ZyXEL deployed the WAC6503D-S 802.11ac dual-radio professional access point featuring innovative smart antenna design, which offers over 700 optimized signal patterns that can change dynamically to adapt to different environments. The AP is perfectly suited to the library environment where users require stable, high-speed wireless connectivity throughput.

Seamless connectivity without compromising security
The two sets of wireless SSIDs used by NCTU faculty, students, and guests adopt the RADIUS authentication. ZyXEL used the NXC5500 wireless LAN controller, which supports RADIUS, enabling to seamless integration of the existing NCTU library's guest login system.

The new wireless solution provides advanced Wi-Fi features such as load balancing and smart-client steering to ensure a smooth, uninterrupted wireless access experience for all users especially in high-demand areas such as multimedia e-learning facilities. Furthermore, the reliable, scalable infrastructure, and centralized network management save valuable IT resources.

Network security was also a primary concern for this project, in particular because the library is accessible to off-campus guests. Therefore, ZyXEL provided NCTU with the USG1900 unified security gateway, which includes firewall, anti-virus, content filtering, and intrusion prevention system (IPS) features. The device creates a complete line of defense around the library's wireless network, providing peace-of-mind to users as well as to administrators.

Maintaining service quality
ZyXEL's new-generation network maintenance and operation platform, ZyXEL Network Insight (ZNI), incorporates all of the installed equipment and systems to provide online status reports instantly while monitoring the network for abnormal activity.

The NCTU library's IT team can effortlessly manage all network facilities and receive updates on the facilities' current status. They are also able to monitor network traffic and activities, as well as deal with any issues immediately to prevent problems that could hamper access to various critical learning resources, such as thesis and international journals.

Staying ahead of demand
NCTU reports that the network solution provided by ZyXEL for its library has been completely hassle-free. In addition, the entire project only took a month to complete — from October-November, 2015. During the installation period, there was zero interference with the existing network's connectivity. ZyXEL's support of the project did not end with deployment. The ZyXEL team provided continuous remote checking service for two months to ensure that the new infrastructure was performing properly. During routine checks, the ZyXEL team detected that one switch experiencing technical difficulties and immediately informed the library's IT team, resolving the problem before further issues occurred.

The new network now supports up to a thousand users at one time, and faculty and students are reported to be highly satisfied with network quality. Prior problems involving connectivity issues and complaints about the network no longer exist. The IT team can now focus on their key duties. The outstanding performance of the ZyXEL WAC6500 Series only requires one-to-one replacement to be upgraded to the latest 11ac Wi-Fi, helping NCTU save significant expense that would otherwise be incurred conducting new site surveys and laying out network wires.

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Products Used

WAC6503D-S
802.11ac Dual Radio Unified Pro Access Point

- ZyXEL smart antenna provides premium performance anywhere
- Advanced IEEE 802.11ac offers up to 1.75Gbps combined data rates
- Industry-leading Rx sensitivity as low as -102 dBm
- AP Flex,™ ZyXEL ONE Network utilities, DCS and tool-less bracket design streamline deployment
- Load balancing and client steering ensure optimal wireless experience
- ZyMesh easily extends reliable Wi-Fi network

NXC5500
Wireless LAN Controller

- Centralized WLAN management and auto provisioning
- Manages up to 512 APs with granular access control
- ZyMesh simplifies complex, inconvenient cabling Wi-Fi Deployments
- Comprehensive features for WLAN performance optimization and always-on Wi-Fi connectivity
- Wireless LAN performance optimization via dynamic channel selection and load balancing
- Guest authentication by QR code

USG1900
Unified Security Gateway

- High-performance, high-value Next Generation Firewall (NGFW) for medium-sized businesses and campuses
- Anti-malware protection with firewall, anti-virus, anti-spam, content filtering, 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 streamlines the configuration and management efforts
- Built-in WLAN controller for centralized AP management and effortless WLAN scalability of up to 18 APs
- ZyXEL One Network is supported

GS3700-24
24-port Gigabit L2+ PoE Switch
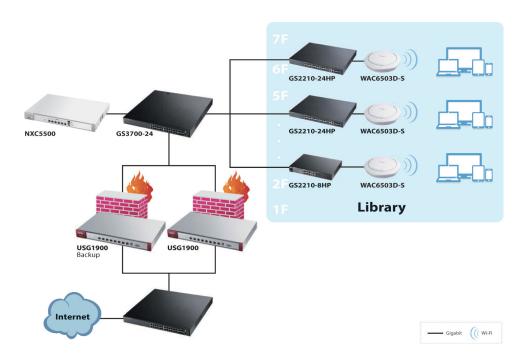
- Full Layer 2 feature set with Layer 3 features including static routing policy-based routing, VRRP and ECMP support
- Four (4) Gigabit SFP uplink flexibility
- 24 ports of Gigabit Ethernet desktop connectivity
- Hot-swappable power supply and fan modules
- Internal redundant power supply design
- High PoE power budget up to 1000 W

GS2210-8/24HP
24-port Gigabit L2 PoE Switch

- Fully managed Layer 2 switching solution
- GbE RJ-45 and GbE SFP connectivity
- Complies with IEEE 802.3af PoE and 802.3at PoE Plus
- High 375 W power budget
- L2 multicast, IGMP snooping, MVR and voice VLAN for convergence
- Enhanced network protection with IP source guard, DHCP snooping, ARP inspection, CPU protection
- L2, L3 and L4 filtering, MAC freeze, port isolation, guest VLAN for improved isolation and access control
- Future-proofed with IPv6 support
- Supports ZON Utility and ZyXEL One Network inter-device features for easier, more efficient setup and management

Diagram

NXC5500	GS3700-24
7F	
6F	GS2210-24HP WAC6503D-S
5F	GS2210-24HP WAC6503D-S
2F	GS2210-8HP WAC6503D-S
1F	**Library**

USG1900 Backup   USG1900

Internet

—— Gigabit   (((Wi-Fi

About ZyXEL Communications

ZyXEL Communications Corp., founded in 1989 and headquartered in Taiwan, is the leading provider of complete broadband access solutions. As one of the early modem manufacturers, ZyXEL has gone through transformations in the fast-paced networking industry. Delivering cutting-edge communications innovations to more than 400,000 businesses and more than 100 million consumers throughout the world, today ZyXEL is one of the few companies in the world capable of offering complete networking solutions for Telcos, small to medium-sized businesses, and digital home users for a wide range of deployment scenarios. Telco solutions include Central Office Equipment, Customer Premise Equipment, Wired and Wireless Access Network Devices, and Carrier Switches. SMB and Enterprise solutions include Unified Security Gateways, LAN Switches, WLAN, and IP Telephony. Digital Home solutions include Network Connectivity Devices and Multimedia Solutions.

The company has 1000 employees and distributors in 70 countries, reaching more than 150 regional markets. The ZyXEL Communications Corp. includes 35 subsidiaries and sales offices and two research and development centers worldwide. For more information, visit the company's Website, http://www.zyxel.com.