



Success Story

ZyXEL Upgrades Indian Research Facility with GEPON Network Solution

"The solution given by ZyXEL was based on the futuristic technology of FTTX on GEPON to serve our purposes of mobility, support future applications like IPTV, cable TV, smart campus applications, and building management applications, along with an existing need for triple play (voice, video, & data), surveillance and Wi-Fi. At the same time, it contributes to the objective of energy conservation, real estate conservation, keeping waste to a minimum and keeping the OPEX & CAPEX optimized. ZyXEL introduced us to their white paper on the concept of saving on electricity-maintenance-real estate respectively, which was very much in line with our objective of eco-friendly and green technology."

N.K Naik, Tech. Officer 'B'
CPPRI

Overview

Customer Name

Central Pulp & Paper Research Institute (CPPRI)

Customer Industry

Education

Challenges

- Upgrade campus network covering 48 hectares of research facilities for high-speed optical and wireless connectivity
- Network must provide IP-surveillance infrastructure for security

Solution

- GEPON Optical Network Unit
- 8-port GEPON Optical Line Termination
- 8-port GbE L2 PoE Switch
- Wireless LAN Controller
- Dual-Radio Managed Access Point

Benefits

- Saves significant cabling over any comparable copper solution
- End-to-end Gigabit connectivity
- Complete control and management of the wireless network ensures seamless roaming, self-healing and thorough security
- Central management solution
- Provide secure, high quality network to users

Background

From a small laboratory, the institute has grown into a national-level research organization employing 115 staff. The total area covered is about 49 hectares with one administrative block and two laboratory blocks. The Institute has 69 residential quarters and guest house facilities.

The main objective of the institute is to promote the R&D and discovery connected with the pulp and paper industry. The institute is equipped with sophisticated, modern facilities for carrying out the research on laboratory and pilot plant scale, and is staffed with well-trained scientific personnel.

Challenges

The institute is spread over a relatively large area (48 hectares), and includes an administrative block, central library, IT center, research wings, residential flats, nurseries for plants and green areas.

The scientists at the institute need network mobility in order to access their exploration data, articles and research papers from any point on the campus.

Secondly, as mandated by the Indian government, all world-class institutes must have IP surveillance infrastructure in place to maintain security.

Thirdly, as IT is just a service enabler and not the key research subject of the institute, it was necessary to create an IT infrastructure that would not only serve present-day needs, but also scale up to the requirements of tomorrow. Therefore, the prerequisite was to create a network which would support future applications like IPTV, cable TV, smart campus applications, building management applications, apart from the existing need for triple play (voice, video and data), surveillance and Wi-Fi.

Solutions and Benefits

ZyXEL installed the core device for its FTTH network solution, an ONU-6100B-22 GEPON Optical Network Unit with 1 gigabit port, at a central location on the campus. NXC5200 Wireless LAN Controllers were also installed at the server room. An OLT-1308S-22 8-port GEPON Optical Line Termination was connected to other buildings on campus by single-mode single-core optical fiber.

As the solution is upon GEPON technology, a single-mode single-core fiber has been split into multiple single cores of single-mode optical fiber with the help of passive splitters. Each of these multiple cores terminates at various campus locations with optical network terminal units (ONU). The ONUs serve wired users on gigabit electrical ports. The ONU units also provide data and power to managed APs on PoE connectivity. These ONU units are also centrally managed via the OLT.

NWA5560-N wireless APs are managed by wireless controllers located at the server room. All wireless APs provide secured and uninterrupted connectivity to users through security profiles created in the wireless controller. Seamless roaming and load balancing has been implemented through the controller. The wireless controller manages any radio interference at the AP by selecting a non-interference frequency band, thereby contributing to a self-healing wireless managed smart network.

Finally, as one of the key focus areas of the institute is to make the industry eco-friendly and as green as possible, it was essential to build the infrastructure in such a way that it contributes to the objective of energy conservation, real estate conservation, waste reduction and OPEX & CAPEX optimization.



Deployment of the network on ZyXEL GEPON and Managed Wireless solution has the following benefits:

- Though users were spread across various locations on campus, the deployment of GEPON technology for the network saved significant cabling over any comparable copper solution
- End-to-end Gigabit connectivity was achieved using GEPON
- Managed Wi-Fi connectivity on the same network was achieved with the help of PoE-based ONUs
- Complete control and management of the wireless network ensures seamless roaming, self-healing and thorough security
- The network is ready for voice, video and data services, as well as future applications like IPTV, cable TV, IP surveillance, building management and smart campus
- There is facility for centralized management and provisioning to minimize administrative overhead
- There is a facility of captive portal for user authentication with local and radius server

Products Used



ONU-6100B-22 GEPON Optical Network Unit

- 1 GEPON interface with SC type connector (IEEE 802.3ah)
- LAN interface: 1 auto MDI/MDI-X 10/100/1000 Mbps port
- Wavelength: 1310 nm for upstream and 1490 nm for downstream
- Power: 12 VDC @ 1.5A



OLT-1308S-22 8-port GEPON Optical Line Termination

- 8 GEPON SFP open slots with DDMI support
- 1000BASE-PX20 SFP for 20 km distance support
- 2 Gigabit Combo + 2 GE SFP uplink ports compliant with IEEE 802.3/u/ab
- up to 4 trunking ports for uplink
- Support up to 64 ONUs per PON interface
- Support FEC
- Support AES or triple churning encryption
- Support 4 LLIDs per ONU
- 16K MAC addresses table
- Management through console, Telnet, SNMP, or web management
- Firmware upgrade FTP
- Configuration saving and retrieving
- Overheat detection
- LED indications for link status
- AC/DC power input for redundancy
- PON port redundancy
- Hot swappable for fan module and PON modules
- 24 Gbps Switching Fabric capacity



NXC5200 Business Wireless LAN Controller

- Centralized WLAN management and auto provisioning
- Manages up to 240 APs with granular access control
- Advanced RF management for optimized Wi-Fi performance
- Secured wireless edge with IDP, anti-virus and firewall
- Flexible traffic forwarding with tunnel and distributed modes
- Comprehensive guest network management features
- User-centric management solution for BYOD trend



GS2200-8HP 8-port GbE L2 PoE Switch

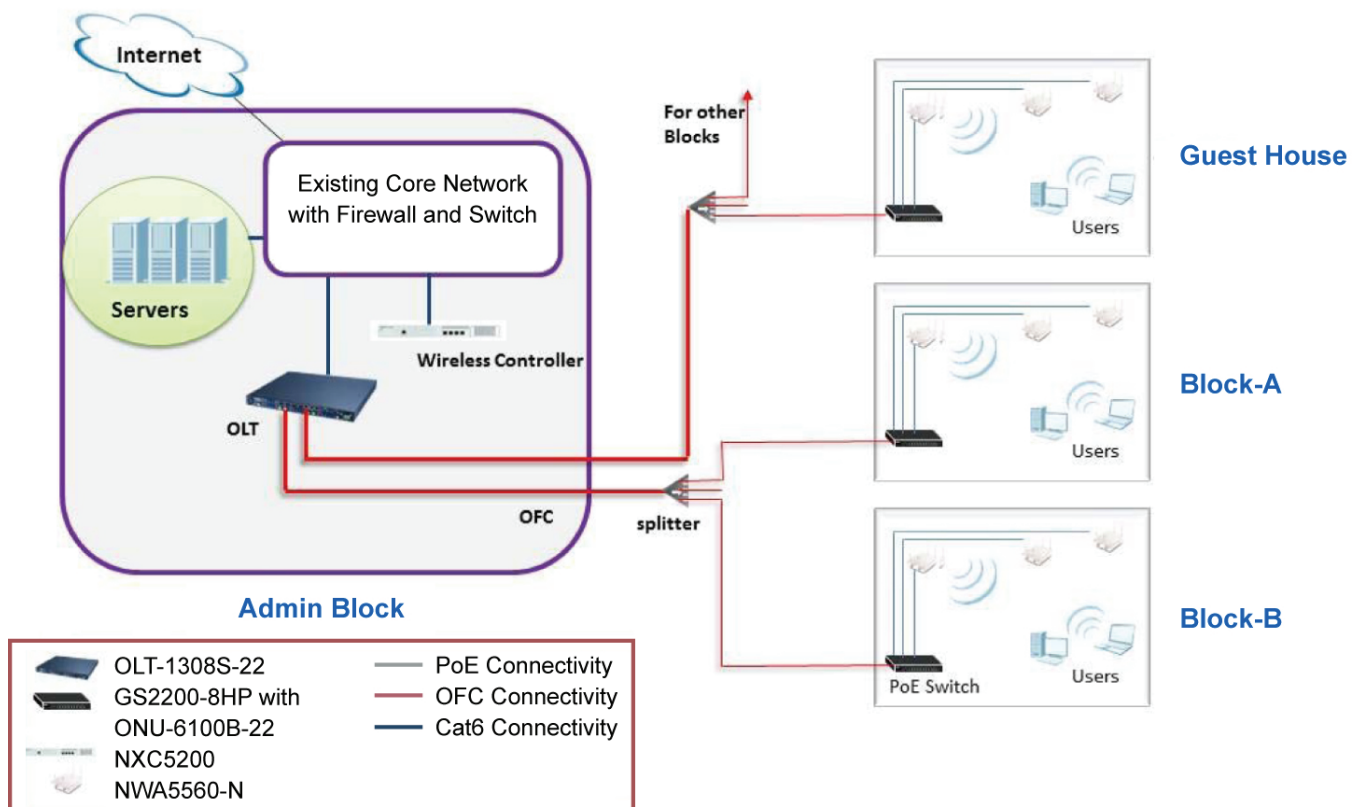
- Comprehensive L2 switching features
- 20 Gbps non-blocking switch fabric
- 2 dual-personality (RJ-45/SFP) GbE interfaces
- IEEE 802.3at PoE Plus and IEEE 802.3af PoE support
- Port security and enhanced 802.1X port authentication
- MAC freeze and intrusion lock
- 8 IEEE 802.1p hardware priority queues
- WFQ, WRR and SPQ queuing algorithm



NWA5560-N 802.11 a/b/g/n Dual-Radio Managed Access Point

- Higher bandwidth and superior performance with 802.11n
- Four external detachable dual-band antennas
- Enterprise-class WLAN coverage and functionalities as well as comprehensive configuration interfaces Provided along with NXC5200 WLAN controller
- Built with Low Smoke, Zero Halogen (LSOH) materials for plenum rating for UL 2043 support

Diagram



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 modern 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 more than 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>.

Copyright ©2015 ZyXEL Communications Corp. All rights reserved. ZyXEL, ZyXEL logo are registered trademarks of ZyXEL Communications Corp. All other brands, product names, or trademarks mentioned are the property of their respective owners. All specifications are subject to change without notice.