LAYER3 HELPS BUILD HIGH-SPEED, SECURE CAMPUS NETWORK FOR ELIZADE UNIVERSITY, ILARA-MOKIN, ONDO STATE.

Summary

Industry: Education

Selection Criteria: Traffic performance, solution reliability, network security, services flexibility, cost-efficiency, scalability and ease of management.

Network Solution: The High performance Campus LAN solution comprises of Juniper Flagship product such as, the MX960 series device for Core Routers; Juniper EX4200 series switches as Access and Distribution layer Switches; Juniper 3400 SRX as Firewall Security devices; Juniper WLC 800 as WLAN Controllers; Juniper IC 6500 series appliance for Network Access Control (NAC) and Junos Space device as the management interface.

Results: Enhanced network performance, reliability, and stability; high-speed, reduced security threats; Very high cost efficiencies increased the university's "brand value" with a world-class educational infrastructure.

The Elizade University, estab aims to attract the best and the brightest students in Nigeria and beyond, and provide them with practical-oriented scientific, technological and liberal arts education which shall make them self-reliant and be job creators..

The vision of Elizade University is to be a "world-class institution dedicated to the pursuit of academic and moral excellence in the context of the relevance of knowledge and character to the developmental aspirations of mankind"

The University is conceived as a "one-stop" compact and ICT-driven conventional university with great focus on Science and Technology programmes, and with emphasis on practical skills acquisition

The Need

Elizade University needed the best-in-breed high-performance network equipment to provide a robust network coverage within the entire campus, improving collaboration among researchers, faculty, staff, and students, and to support the deployment of new learning applications.

To deploy a high performance Campus LAN solution for Elizade University (EU) at Ilara-Mokin, in Akure, Nigeria. This optimized LAN network shall enable EU achieve the following:

➢ Enhanced learning experience for her teaching staff and students.
➢ Make classrooms and online education tools accessible and very efficient.
➢ Offer a secure and converged network that combines Voice, Data and Video on one single network.
➢ Provide a secure and reliable backbone for new IP-based services, while leveraging the existing infrastructure for reduce telecommunications expenses on campus.

Selection Criteria

User convenience, scalability and robustness, ultra-low latency, network management and security were of primary concern to Elizade as far as the network was concerned.

Elizade recognized that a key pillar to its ultimate objective—of becoming one of the country's leading educational institutions—was its campus network infrastructure. The university vetted an extensive list of criteria, including the following:

1. Products must demonstrate the carrier-class highest levels of performance, reliability, stability, and security, and support existing network applications as well as network development over the next five years.

2. Vendors must render the highest level service quality and flexibility to enrich business functions

3. Products must be easy to implement and manage, without sacrificing efficiency and cost-effectiveness, and seamlessly interoperate with the original network and protect existing digital assets.

4. Products have to demonstrate outstanding expandability, with scalability for network development, and quickly deliver maximum ROI

Solution

Layer3 implemented a network design that combined a range of feature-rich, top of the line, super-redundant, super efficient Juniper Networks solutions for the entire Elizade campus network.

Juniper Networks Flagship MX960 routers High Avilability at the Core with 10GbE line cards in with 10GbE line cards deployed at the core layer. The fiber backbone network, connecting all the various faculties, departments and hostels terminate on this core Router. Power–over-Ethernet (PoE) in the access layers via EX4200 Distribution and Access switches in Virtual Chassis provide connectivity to the campus

The new network uses Juniper's MX 800 Wireless Controller Platform with over 50 Access points sprawled over the campus providing a blanket of wireless coverage which supports data, voice and video traffic.

It supports access points that control three spatial streams in deployments of 802.11n. It also enables seamless and secure deployment of enterprise wireless networks over existing L2/L3 network without disruption.

The MX 800 scales to support demanding wireless applications indoors and outdoors, including voice over Wi-Fi for thousands of users. It also provides nonstop availability and hitless failover without service interruption — even in the event of a controller failure.

To secure the network and provide IP Address management, two SRX 3400 service gateways was deployed in high availability at the core layer; it provides perimeter security, content security, access control, and network-wide threat visibility and control. Best-in-class firewall and VPN technologies secure the perimeter with minimal configuration and consistent performance. The SRX 3400 cluster also uses its UTM engine in tandem with IPS to provide a robust secure barrier in the internal and external context.

The new network uses Juniper's Infranet Controller, IC6500 to provide granular Network Access Control, (NAC) to resources for the Faculty and student on the network. It can be implemented at the Layer2 or Layer3 Level.

The Juniper Space JA1500, also deployed at the core, provides the device management of the entire network and all active devices from a single point. Device configuration and updates are also carried out on the Juniper Space. Reducing the time to manage and provision new nodes on the network to the barest minimum

Results

Through the deployment of Juniper Networks products and solutions, the Elizade campus network has acquired the characteristics of a carrier class network.

Juniper Networks SRX 3400 services gateway cluster in conjunction with the MX960 routers, the core equipment of Elizade's network consolidates fast, highly available switching, routing, security and applications capabilities in a single device thereby delivering new services, safe connectivity, and a satisfying end user experience. Its a high-performance, scalable, carrier-class security device with multi-processor architecture. This services gateway has a capacity of up to 20 Gbps firewall, 6 Gbps IPSec VPN or 6 Gbps IPS, and 175,000 new connections per second

The EX4200 line supports Juniper's Virtual Chassis technology, which allows up to 10 switches to be interconnected over a 128 Gbps backplane to create a single, logical device supporting up to 480 users and 20 10GbE uplink ports.

Each EX4200 switch can provide a full 15.4 watts of power for each PoE port, ensuring that campus network maintenance personnel need no longer worry about power distribution.

Deployed in a Virtual Chassis configuration, The EX4200 switches share a common Junos operating system and configuration file, greatly simplifying system operations, maintenance and troubleshooting. Interconnections were made over the 10GbE uplink ports, so members of the same Virtual Chassis configuration are in

different wiring closets, on different floors or even in different buildings, and still are managed as a single device.

The EX4200 switches also run the same Junos operating system that powers other Juniper switches, routers and security devices, providing a consistent set of features and capabilities across the Juniper network infrastructure.

And, when an error occurs in the remote configuration, the Junos OS rollback feature easily solves the problem, thus achieving a substantial reduction in onsite maintenance, not to mention manpower, resource and energy savings.

The IC6500 network access server, through the Unified Access Control Agent or UAC agent-less mode, gathers user authentication, endpoint security state, and device location data, in order to define dynamic network access policies that it distributes to enforcement points across the network. These network access enforcement points can include any vendor-independent 802.1X-enabled access point and switch, such as EX Series Ethernet Switches, and any Juniper Networks firewall platform, , as well as the robust networking and security services of SRX Series Services Gateways.

The Cluster of MX 800 Wireless LAN Controllers form the mobility domain, which provides seamless roaming, intrusion protection and RF management over the entire campus WLAN network.

The WLA522 can plays a key role in rogue and intrusion detection, as well as denial-of-service (DoS) attack detection. It features ActiveScan which allows it to scan all 802.11 channels while providing wireless connectivity to mobile clients on campus

About Layer3

Layer3 is a dynamic provider of enterprise-wide, information technology and telecommunications solutions. We deliver value through the application of consultancy & technology.

We are a professional services organization and systems integrator. We specialize in the design, implementation and support of complex voice, video and data networks.

We provide expertise in designing network solutions – maintaining flexibility for expansion and growth to new technologies.

To find out more about Layer3's products and solutions, visit www.layer3.ng

APPENDIX A: NETWORK TOPOLOGY