

CASE STUDY

NED University

About NED University

NED University of Engineering and Technology is a public university located in the urban area of Karachi, Sindh, Pakistan. It is one of the oldest and best engineering universities in Pakistan, highly regarded for its teaching practices and graduates that have gone on to become very successful. It is a recognized degree-awarding university of Pakistan affiliated with the Higher Education Commission of Pakistan, a government-appointed body. The university is spread across three campuses: the main campus (Karachi), the city campus (LEJ campus), and the Thar campus. In this case study, we will be focusing on the main campus located in Karachi.



THE NEED

NED University was in dire need to upgrade its current Wi-Fi infrastructure that was in place to meet the increasing demand of its students and faculty. An ever-increasing student population made it necessary to have a scalable solution that could provide robust coverage across multiple buildings and outdoor areas while enabling centralized management for simplified configuration and monitoring. Additionally, NED wanted to utilize virtual machine technology and GWN Manager for enhanced efficiency, flexibility, management, and security.

NED needed to fulfill the following network requirements to upgrade its current Wi-Fi setup:

- Seamless and reliable Wi-Fi connection was required throughout the entire campus to support many concurrent users.
- Taking into consideration the student and faculty requirements of the university, large amounts of files and multimedia content are regularly transferred and downloaded which requires high-bandwidth allocation.
- Security was also a key concern due to the sensitive information being transferred throughout the wireless network. As a result, secure network access for students and staff was a necessity along with a guarded connection for foreign students staying in the dorm rooms.
- NED wanted a centralized network management platform to easily configure, monitor, and troubleshoot all the Access Points.

PRODUCTS DEPLOYED



GWN7600
Wave-2 Wi-Fi Access Point

Classrooms and Labs



GWN7615
Wave-2 3x3:3 Enterprise Wi-Fi Access Point

Lecture Halls and Auditoriums



GWN7660
802.11ax 2x2:2 Wi-Fi 6 Access Point

Outdoor Areas



GWN Manager
Cloud Management Platform

Access Point Management

THE SOLUTION

After a thorough assessment and consulting with Linuro Systems, NED chose to deploy a combination of Grandstream's Access Points, which included the GWN7600, GWN7615, and the GWN7660 Wi-Fi 6 Access Point. In addition to the Access Points, a virtual machine environment was deployed and Grandstream's GWN Manager was used to manage all the deployed Access Points.

GWN7600 (18 units):

- 18 GWN7600 Indoor Access Points were deployed in classrooms, labs, and administrative areas to provide reliable coverage and high-speed Wi-Fi connectivity throughout these rooms.
- The GWN7600 can support 450+ concurrent client devices per access point, which ensures that everyone at these venues will get internet access and the access point also has a coverage range of 165 meters.
- The GWN7600 supports dual-band technology, 2.4GHz and 5GHz with advanced antenna features that ensure excellent signal strength and coverage throughout the room.

GWN7615 (56 Units):

- A total of 56 GWN7615 Access Points were deployed in high-density environments such as lecture halls, auditoriums, and other common areas around campus.
- The GWN7615 was selected in these locations as it offers exceptional performance with 3x3:3 MU-MIMO technology and supports more than 200 concurrent users per access point.
- Dual-band technology coupled with optimized bandwidth allocation and minimized interference made the GWN7615 the perfect option to deploy in these environments.

GWN7660 (12 Units):

- Although the GWN7660 is a Wi-Fi 6 Indoor Access Point, Linuro Systems deployed 12 of these access points in outdoor areas such as sports facilities, courtyards, walkways, and campus perimeter areas.
- The GWN7660's robust weatherproof design and concurrent dual-band operation made this access point the ideal option to provide reliable outdoor connectivity to all users.

Virtual Machine Environment:

- A virtual machine was set up to host the Grandstream GWN Manager, which manages all the access points deployed at the University.
- The benefit of visualization includes resource consolidation, scalability, and flexibility.

GWN Manager:

- Grandstream's free software network management platform, GWN Manager, was deployed on the virtual machine environment.
- GWN Manager provides stress-free centralized management and monitoring of all access points from a single interface.
- Processes such as access point configuration, firmware updates, and troubleshooting tasks are all streamlined by using GWN Manager

HOW WERE THE ACCESS POINTS DEPLOYED?

1. Site Survey:

Prior to installing the Wi-Fi access points, Linuro Systems conducted a detailed survey of the site to ascertain optimal AP placement. They took into consideration factors like building layouts, user density, and network coverage requirements.

2. Virtual Machine Setup:

As per the request of NED University's administration team, Linuro Systems configured the setup of the virtual machine environment with the help of Grandstream's web-based documentation that is available on Grandstream's documentation center. To learn more about this step, click on the link below.

<https://documentation.grandstream.com/knowledge-base/gwn-manager-deploying-a-virtual-machine-from-an-ova-file/>

3. Access Point Installation:

The GWN7600, GWN7615, and GWN7660 access points were installed on campus based on the results of the site survey. The installation team at Linuro ensured that the access points had proper mounting, cabling, and power supply.

4. Network Integration:

The newly installed Grandstream access points were integrated with NED's already existing network infrastructure, thereby ensuring connectivity to the virtual machine environment hosting the GWN Manager.

5. GWN Manager Configuration:

GWN Manager was used to configure and update all GWN access points, including network settings, user authentication, and access point profiles. Additionally, established policies were put in place for wireless networks, security, and Quality of Service (QoS) settings.

6. Access Point Registration:

Each access point that was deployed around the campus was registered within GWN Manager, which enabled centralized management and control over the entire GWN solution.

7. Performance Optimization:

Linuro Systems fine-tuned the access point settings, and optimized transmit power levels, channel selection, and interference mitigation to ensure high-quality performance and to minimize signal interference.

8. Security and Monitoring:

Robust security measures were implemented that included encryption protocols and strong authentication mechanisms. GWN Manager's monitoring and alert capabilities were utilized to track access point performance, manage firmware updates, and troubleshoot any issues.

The logo for Linuro Systems, featuring the word "LINURO" in a bold, orange, sans-serif font. The letters are set against a black rectangular background, which is itself centered within a white square. The entire logo is framed by a thin blue border.

PROVIDED BY LINURO SYSTEMS

Linuro Systems has proved itself as a reliable, stable and trustworthy partner of Business Communications including IP Voice & Video Telephony, Wi-Fi Infrastructure, Business Conferencing, Audio/Video Visualization and Digital Signage Solutions in Pakistan. Our wide range of IP Voice and Video Telephony makes a quality network between you and your clients.

THE RESULT



Comprehensive Coverage:

The deployment of the GWN7600, GWN7615, and Wi-Fi 6 GWN7660 access points, coupled with the virtual machine environment and GWN Manager, guaranteed seamless Wi-Fi coverage throughout the NED University campus. Classrooms, common areas, outdoor areas, administrative offices, and dorm rooms were all equipped with reliable and high-performance Wi-Fi connectivity.

Centralized Network Management:

The integration of GWN Manager within the virtual machine environment allows for centralized management and control of the entire access point network. Administrators can easily configure settings, manage firmware updates, and monitor performance from a single, user-friendly interface. This streamlines the management process and saves time and effort while ensuring consistent network settings across all access points.

Scalability and Flexibility:

The virtual machine environment provides scalability, allowing for easy expansion of the Wi-Fi access point network as NED University's needs grow. Additionally, GWN Manager could accommodate the growing network without requiring significant infrastructure changes, and any configuration needs can quickly be pushed to GWN devices as they were brought online. This flexibility ensured that the institute's Wi-Fi infrastructure could adapt to future demands and advancements in technology.

Enhanced Efficiency:

The virtual machine environment and centralized management with the GWN Manager simplified the configuration and monitoring processes. Administrators can now efficiently manage the entire network, quickly troubleshoot issues, and proactively address potential performance bottlenecks. This enhanced efficiency resulted in improved productivity and minimized network downtime.

Secure Access:

Robust security measures, including encryption protocols and strong authentication mechanisms, were implemented to ensure secure access for students, staff, and authorized users. The GWN Manager provides granular control over user authentication and access policies, enhancing overall network security.

Enhanced User Experience:

The deployment of Grandstream's access points, with advanced technologies such as MU-MIMO and dual-band operation, provided an enhanced user experience. Students, teachers, and staff can enjoy seamless connectivity, high-speed internet access, and reliable performance, even in high-density areas.

Future-Proof Solution:

The combination of Grandstream's access points, virtual machine technology, and GWN Manager provides a future-proof solution for NED University. The University can easily expand the network, incorporate new technologies, and adapt to changing demands without major infrastructure overhauls.

The institute now enjoys comprehensive coverage, centralized management, scalability, and enhanced security. The solution has transformed the learning experience, improved productivity, and positioned the institute for future growth and advancements in technology.

FUTURE PLANS WITH GRANDSTREAM



NED University has seen overwhelming success with the performance of Grandstream Access Points, virtual machine environment, and GWN Manager, and is planning on expanding Grandstream's access point solutions to their other branch campuses, which are the city campus (LEJ campus) and the Thar campus. They also anticipate adding more access points to the remaining areas of the Karachi campus.

According to the administration team at NED, they will require a total of 500 access points soon after analyzing the performance of the installed Grandstream access points.

