



Enhancing Logistics Operations through Smart and Secure Networking

Overview

At the logistics center of a large cosmetics brand in Icheon, Gyeonggi Province, spanning 16,000 square feet, seamless connectivity and secure data transmission were essential. The warehouse handles the full logistics cycle from receipt and inspection to packaging, shipping, and distribution. Efficient operations required real-time synchronization between the warehouse management system (WMS) and headquarters ERP, reliable PDA-based inventory tracking, and stable connectivity for IoT sensors and CCTV surveillance.

To meet these demands, Zyxel Networks deployed an integrated wired and wireless solution, replacing consumer-grade devices with professional hardware managed via the Nebula cloud networking solution. This setup provided a high-performance, secure network that underpins smooth, high-efficiency warehouse operations.

Challenges

Previously, the company used consumer-grade routers unsuitable for a demanding logistics environment. Metal structures and dense cargo caused signal attenuation, forcing workers to manually reconnect devices while moving. Besides, individually managed routers led to IP conflicts, resulting in frequent downtime and slow troubleshooting.

Meanwhile, the lack of a secure channel to headquarters left the network exposed to cyber threats, including malware, phishing, DDoS attacks, and SQL injection. Traditional NAT-based firewalls were insufficient against increasingly sophisticated attacks, such as malicious email links or phishing websites.

Customer

Cosmetics company

Industry

Cosmetics

Location

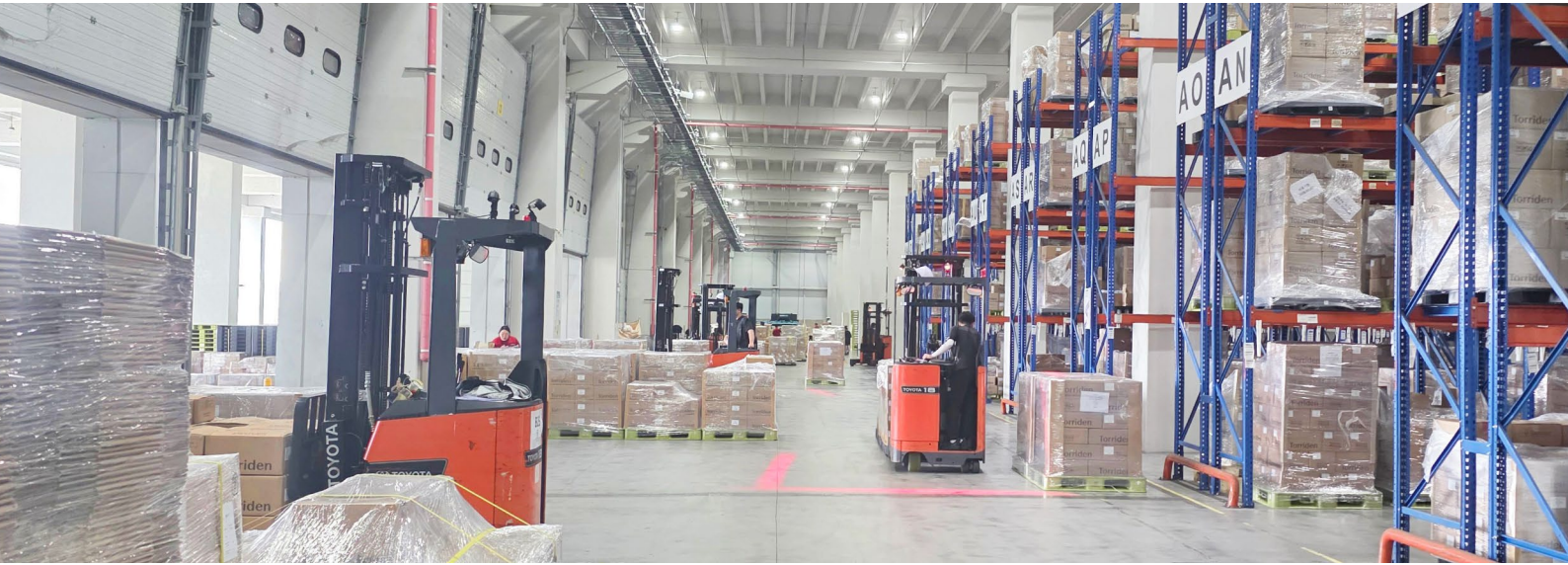
Icheon, South Korea

Organization Size

16,000 square feet
(5,000 pyeong)

Customer Background

One of the major cosmetics brand's large-scale logistics centers is located in Icheon, Gyeonggi Province, South Korea. This central hub handles both domestic and international shipments and features a spacious warehouse with high ceilings and two-story heavy-duty racks.



Solutions

To address these challenges, WAX610D WiFi 6 APs were deployed throughout the logistics center and integrated into the Nebula cloud networking solution, establishing a high-performance wireless environment. Nebula enables real-time, centralized monitoring of all access points, offering comprehensive visibility into connection status and client activity for more intuitive network management.

When signal strength drops, 802.11k/v steers the device toward the best available AP for smooth, uninterrupted connectivity. 802.11r Fast Roaming enables smooth, low-latency transitions for mobile workers. A unified SSID lets users stay seamlessly connected after the first login.

In high-ceiling, heavy-rack areas, the WAX610D's dual-optimized antennas can optimize coverage and minimizes signal overlap, ensuring stable wireless performance throughout the center. Additionally, AP load balancing supports consistent connectivity during peak usage, maintaining reliable, high-quality wireless service across the facility.

Inventory and shipping data from the WMS needs to be synchronized with the headquarters' ERP system, requiring reliable, encrypted transmission. An IKEv2-based site-to-site IPsec VPN is established between the logistics center's USG FLEX 700 firewall and the headquarters' VPN gateway. AES encryption ensures secure data transfer through the VPN tunnel, while real-time monitoring and automatic reconnection during outages guarantee uninterrupted business operations.

Connected logistics centers face multiple cyber threats, including malware, phishing, DDoS attacks, and SQL injection. Traditional NAT-based firewalls are insufficient against sophisticated threats such as malicious email links or phishing websites.

The USG FLEX 700 firewall integrates Bitdefender and McAfee threat intelligence, providing real-time malware detection, web filtering, IPS, and application control. This protects against external and internal threats by blocking malicious or unauthorized sites. Security events are sent to the Nebula cloud and alert administrators in real time, enabling immediate response.

Office areas within the logistics center use wall-mounted communication terminals for wired connections. Unauthorized devices such as personal routers or IP phones can create network loops or IP conflicts, potentially affecting the entire network. Loop Guard and DHCP Server Guard features on the switches mitigate this risk. Loop Guard detects network loops caused by misconnected devices and blocks affected ports, while DHCP Server Guard prevents IP conflicts by blocking unauthorized DHCP servers. Together, these features prevent failures from spreading and ensure stable network operation.

Network equipment is spread across this large logistics center, making on-site management inefficient. The Nebula cloud networking solution provides a centralized system for monitoring and managing all network devices, clients, and security events in real time via web browser or mobile app. Nebula's **Automatic Network Topology** feature provides a clear view of connections and potential failure points. In addition, Nebula simplifies remote troubleshooting with its **Live Tools**, offering ping tests, traffic verification, and device reboots without requiring physical visits.

Centralized management of firmware updates, security policies, and SSID configurations further improves efficiency and prevents misconfigurations. In the event of a failure, administrators receive email or mobile push notifications, reducing response times and enhancing overall network stability and operational efficiency.



Results

With Zyxel Networks' solution in place, mobile workers stay seamlessly connected throughout the warehouse, including challenging high-rack areas. The WMS and ERP systems synchronize in real time to keep operations accurate and up to date. VPN encryption and advanced threat protection safeguard data and defend against cyber risks, and Nebula's centralized management enables real-time monitoring, instant alerts, and remote troubleshooting. Nebula-managed professional networking equipment delivers stable roaming, secure connectivity, and a reliable foundation for high-efficiency warehouse operations.

- Seamless WiFi roaming for PDAs and tablets, ensuring uninterrupted mobile inventory operations
- Enhanced wireless coverage and performance in high-ceiling, heavy-rack warehouse environments
- Secure site-to-site VPN for real-time, encrypted data exchange with headquarters ERP systems
- Real-time threat response and strengthened network security with integrated protection against malware, phishing, and DDoS attacks
- Optimized switch network design that prevents failures from spreading and maintains stable operation
- Centralized cloud management that reduces downtime, simplifies troubleshooting, and improves operational efficiency

Product List



- WAX610D WiFi 6 Access Point



- XGS2220-30F L3 Access Fiber Switch
- GS1920-24/24HP Smart Managed Switch
- GS1200-5HP Web Managed PoE Gigabit Switch



- USG FLEX 700 Firewall

