Ultra-Reliable Wireless Backhaul for International Air Cargo Hub

AT A GLANCE

A major international air cargo operation upgraded its vehicle communications by replacing legacy Wi-Fi with Cisco Ultra-Reliable Wireless Backhaul (CURWB).

Genwave Technologies designed and implemented a strong wireless backbone, ensuring seamless connectivity for autonomous cargo handling vehicles and enhancing operational efficiency.

CHALLENGES

The cargo hub relies on a fleet of large autonomous vehicles to transport freight between warehouses and aircraft, managing time-sensitive load sequencing. The previous Wi-Fi network suffered from frequent dropouts and dead zones, leading to:

- **Connectivity Issues:** Vehicles often lost connection, disrupting automated workflows.
- **Delays & Costs:** Aircraft loading schedules were delayed, leading to financial repercussions.
- **Safety Risks:** Operators struggled to maintain reliable oversight of autonomous systems.

OBJECTIVES

A solution was required to ensure carrier-grade reliability in critical operations that eliminates Wi-Fi dead zones and packet loss in the terminal's outdoor yard. The goal was to implement a solution with latency and throughput well below the vehicles' operational thresholds and Enhance resilience through redundancy and seamless failover mechanisms.

SOLUTION

Genwave implemented a Cisco Ultra-Reliable Wireless Backhaul (CURWB) tailored for high-density cargo operations:

- **Infrastructure Radios:** Strategically installed throughout to an engineered design for comprehensive coverage.
- **Vehicle-Mounted Radios:** Integrated into autonomous vehicles for consistent, low-latency communication.
- **Vehicle-to-Vehicle Connectivity:** Added operational resilience through peer-to-peer links.
- **Auto-Failover:** Ensured seamless operations, with multiple paths for packet delivery.

This architecture replaced fragile Wi-Fi with a scalable, carrier-grade backbone for operational technology (OT).

RESULTS & BENEFITS

The system operates flawlessly, with llatency well below throughput and well above the vehicle system requirements. Key benefits include:

Operational Continuity:
No disruptions in vehicle connectivity since deployment.

Improved Efficiency
Cargo sequencing and aircraft loading are consistently on schedule.

Reduced Costs:
Eliminated downtime 'leading' to significant financial savings.

Scalable Design:
CURWB infrastructure supports future applications like IoT sensors and smart terminal initiatives.

CONCLUSION

By replacing 'legacy' Wi-Fi that no longer met the operations needs with Genwave's CURWB solution, this major international cargo operator transformed its vehicle operations into a competitive advantage.

This project highlights how carrier-grade wireless backhaul can enhance safety, efficiency, and reliability in critical logistics environments.

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