

CASE STUDY

North American service provider deploys next-generation microwave transport network for mission-critical connectivity

- Nokia Wavence portfolio for a cost-effective upgrade from 4 GHz to 11 GHz across hard-to-access rocky terrain
- High-performance solution ensures reliable connectivity and circuit diversity for mission-critical operations

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The North American service provider operates an extensive fiber network and a large microwave transport network with hundreds of sites and approximately 2,000 microwave links. Nokia is a microwave radio technology provider for the customer.

This case study describes how Nokia's Wavence portfolio helped upgrade the customer's microwave transport network from 4 GHz to the 11 GHz frequency band within a short timeframe.

The Wavence microwave transport solution provided a reliable and cost-effective alternative in a terrain where it is practically impossible to deploy fiber. In addition, the customer was able to increase the capacity and performance of its mission-critical network.

OBJECTIVE

Migrating the microwave transport network to the 11 GHz band

In February 2020, the Federal Communications Commission (FCC) ruled to make 280 MHz of the 3.7-4.2 GHz spectrum band available for 5G mobile services and mandated incumbent point-to-point microwave networks to relocate to higher spectrum frequencies.

The North American service provider was operating its microwave network on the 4 GHz band. The network was part of the mission-critical infrastructure that supported critical

operations, which could not face any disruption in the service.

The service provider had to undertake a complex project of migrating its microwave network from 4 GHz to 11 GHz, which was the available frequency band in this area.

The project consisted of identifying the equipment that needed to be removed or replaced, removing the old equipment, and installing new radio units and towers.

Higher spectrum frequencies require higher transmitting power to cover the same link distance. The service provider needed a modern microwave transport solution that could operate on the 11 GHz frequency band and enable the performance and coverage required for mission-critical operations.

Additionally, the service provider aimed to build robust coverage and capacity to support the digitalization of industries and enterprises.



SOLUTION

High-performance Wavence microwave transport network for scalable capacity

The service provider chose Nokia as its microwave radio technology provider for an Ethernet backhaul based on the capabilities of the industry-leading Wavence microwave transport portfolio, field-proven in different terrains and weather conditions.

The solution consisted of Wavence Ultra Broadband Transceiver Twin with Extended Power (UBT-T XP) radio units. These dual transceiver units operate on frequency bands

from 6 GHz to 11 GHz and provide high output power to reach long distances between microwave links in challenging terrains such as the mountains.

Nokia supported the customer in determining the best deployment options. The Wavence radio units were installed in a split-mount configuration to enable simple and flexible deployments, easier maintenance and spare parts management.

CHALLENGES

Tight project timeline with difficult weather and terrain conditions

In the project location, the winter weather can be very harsh, and the mountain weather patterns can cause the temperature to drop as low as -60°F (approximately -50°C).

One of the particular challenges for the project was removing the old, 'horn' type of massive antennas before the winter made it too difficult to access the sites.

In their daily work, site installation engineers and, in particular, the antenna crew faced strong winds reaching up to 50 miles per hour (approximately 80 km/h). In addition, it took several hours to transport the crew between the sites in the mountainous terrain.

Nokia worked very closely with the customer to overcome the challenges and employed out-of-the-box methods across the board.

Radio technicians and support engineers jumped in to help the antenna crew with the antenna alignment. The customer's flight operation team helped shuttle personnel and equipment between sites with a helicopter to save valuable time.

The project was completed in 2 months.



RESULTS

Mission-critical grade reliability with an optimized microwave backhaul

Nokia's Wavence microwave transport solution was proven to match the requirements of the ambitious project.

With mission-critical grade reliability and enhanced performance, the service provider continues to support critical operations across a rural, mountainous area while also unlocking digital access for industries and enterprises.

The Wavence UBT-T XP solution features smaller antennas with reduced weight, giving the benefit of reduced site footprints, higher resistance to wind load and lower total cost of ownership (TCO).

The high transmission power of the Wavence radios means that they provide high capacity and performance with smaller antennas.

Microwave radio technology provides a reliable backbone for all types of communications networks

Microwave radio technology provides a robust option in remote areas and terrains where fiber is not cost-effective or where it may even be impossible to deploy fiber.

Microwave radio performance is dependent on the propagation characteristics of the available frequencies. The industry-leading Nokia Wavence microwave portfolio provides several radio variants to match the specific requirements of a wide range of deployment scenarios and frequency bands, providing optimum performance and coverage.

In this case study, we focused on the capabilities of a Nokia Wavence microwave transport solution based on the commercially available Ultra Broadband Transceiver (UBT) portfolio.

The wireless industry has a big role to play in supporting the digitalization of other industries, which paves the path for a carbon-neutral future.

Collaboration between the leading technology innovators is essential to maximize the opportunities that digital services unlock.



Visit the Wavence
Microwave Transmission
webpage to learn more.

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As a B2B technology innovation leader, we are pioneering networks that sense, think and act by leveraging our work across mobile, fixed and cloud networks. In addition, we create value with intellectual property and long-term research, led by the award-winning Nokia Bell Labs.

Service providers, enterprises and partners worldwide trust Nokia to deliver secure, reliable and sustainable networks today – and work with us to create the digital services and applications of the future.

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