

CASE STUDY

Zain Saudi Arabia leverages Nokia's Wavence portfolio to connect Farasan Island to the mainland with high-performance microwave networks

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At Zain, our vision is to ensure digital access to people and businesses everywhere. Together with Nokia, we have transformed connectivity to Farasan Island with a microwave link that's nearly four times the capacity of the old system and far more stable. With the Wavence solution, we can provide better performance to our customers while enhancing operational efficiency and making network expansions easier.”

Mohammad AlNujaidi

CTO Zain KSA



Zain Saudi Arabia is a leading telecommunications provider at the center of the Kingdom's fast-moving communications landscape. Since its launch in 2008, Zain has been instrumental in expanding mobile connectivity, broadband access and enabling Saudi Vision 2030's digital transformation goals. With more than 8 million subscribers, the company is recognized for innovation, customer focus and its role in shaping a more inclusive digital society.

To meet the growing demand for high-performance connectivity, Zain continues to invest in 5G networks, cloud services and advanced transport technologies. A key priority is ensuring that people and businesses in remote regions enjoy the same digital

experience as those in urban centers. Working with Nokia, Zain has deployed microwave transport for extreme long reach, helping overcome geographical barriers and deliver reliable, high-capacity broadband to underserved areas. This approach is vital for bridging the digital divide, enabling equal access to education, healthcare and economic opportunities.

Through these initiatives, Zain Saudi Arabia has strengthened its position as a driver of national progress, combining technological leadership with a commitment to inclusivity and long-term digital growth.

OBJECTIVE

Bring high-performance and reliable data services to Farasan Island while minimizing the environmental impact to the marine life

Zain Saudi Arabia set out to address a critical connectivity challenge: bringing high-performance, high-capacity and cost-efficient data services to Farasan Island while ensuring a reliable connection to the mainland, located just under 50 km away. The goal was not only to strengthen the digital experience for existing mobile broadband users but also to create a foundation for future network growth and new business opportunities.

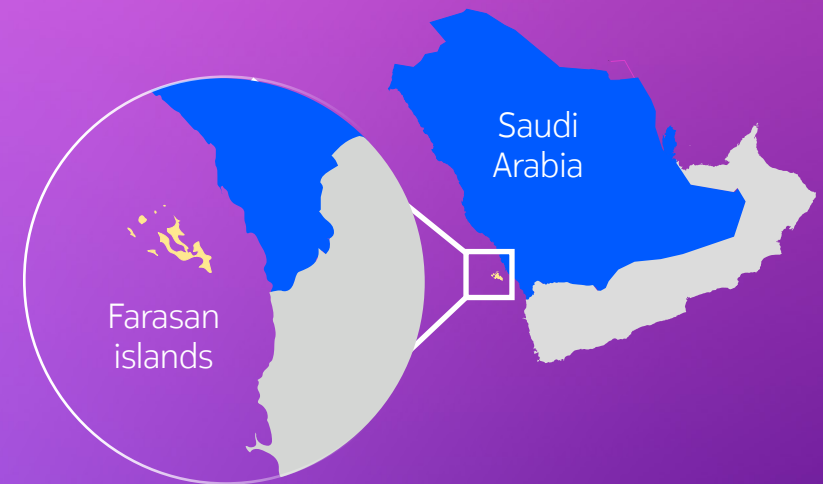
Farasan is more than a remote island, it is a protected marine sanctuary, renowned for its biodiversity and cultural heritage. Home to endangered species such as green turtles, Arabian gazelles and visiting whale sharks, the island reflects the delicate balance between human progress and environmental preservation. Visitors are drawn to its crystal-clear Red Sea waters, enjoying snorkeling, diving and traditional fishing that celebrate both natural beauty and local traditions.

OBJECTIVE

Bring high-performance and reliable data services to Farasan Island while minimizing the environmental impact to the marine life

A central requirement of the project was environmental stewardship. Rather than laying submarine cables across the Red Sea, which could disrupt fragile marine ecosystems, Zain sought a wireless transport solution capable of spanning long distances without compromising performance. This approach would safeguard the region's rich maritime life while still delivering the robust, future-ready connectivity demanded by both consumers and enterprises.

The solution needed to be as sustainable as it was powerful, and capable of withstanding the challenges of a remote, maritime environment while ensuring seamless, high-speed service. By establishing a resilient digital bridge to Farasan Island, Zain aimed to enhance customer experience, enable new radio access network expansions and unlock opportunities for onboarding new B2B customers.



sustainable



High-speed



Robust



SOLUTION

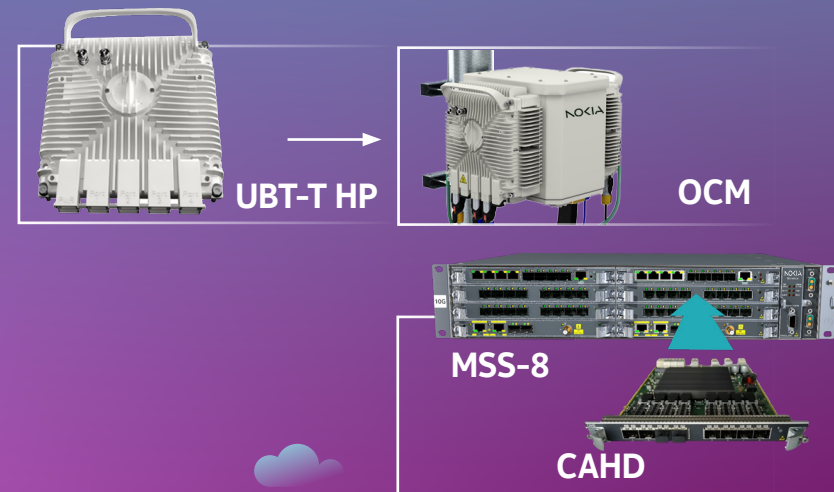
Nokia Wavence portfolio to deliver long-distance, high-capacity, robust links

To connect Farasan Island with the mainland, Zain Saudi Arabia deployed Nokia's Wavence microwave transport solution, featuring the UBT-T HP (high power) transceiver combined with the Outdoor Combiner Module (OCM). The OCM, which minimizes insertion loss and optimizes RF performance, was essential for boosting link capacity over long maritime distances where a standard configuration would not have delivered the same robustness.

Together, the UBT-T HP and OCM significantly improved link performance in low-frequency bands. The OCM enables a full outdoor configuration where the transceiver connects directly to the combiner and antenna. This streamlined setup reduced insertion losses and maximized high performance.

For traffic aggregation, Zain leveraged our Microwave Service Switch (MSS) with Carrier Aggregation High Density (CAHD) card, which consolidates multiple microwave channels in a single band into a high-bandwidth link. With L1 Link Aggregation (LAG), the CAHD card maximized capacity and efficiency to meet the growing demands of mobile broadband users and enterprise services.

To further strengthen resilience, the deployment included Space Diversity, a proven method for mitigating signal fading caused by humidity, rain and atmospheric fluctuations over water. This combination ensures superior availability, enhanced signal quality and reliable performance under even the harshest conditions.



RESULTS

Farasan Island linked to mainland with one of the longest microwave hops in the Kingdom

The deployment of our Wavence microwave transport has delivered a landmark achievement for Zain: establishing one of the longest microwave hops in the Kingdom, spanning 50 km over the open sea. This breakthrough connection links Farasan Island with the mainland at a capacity of 3 Gbps (four times the previous throughput), setting a new benchmark for long-distance wireless transport in the region.

The upgrade has already translated into tangible improvements for customers. Service quality has been significantly enhanced with superior availability and improved signal quality, even under harsh propagation conditions such as strong winds and high humidity, typical of maritime environments. With a designed availability of 99.999%, the link provides the reliability required for both consumers and enterprises, ensuring uninterrupted digital services.

This capacity expansion is also fueling Zain's ongoing RAN rollout on the island, supporting the deployment of two new 5G/4G sites that further enrich mobile broadband coverage and performance. In parallel, the enhanced backbone has opened opportunities for enterprise growth, with the

onboarding of a new B2B customer, the Farasan Islands Reserve, demonstrating the potential for broader business adoption.



Throughput
3 Gbps



Availability
99.999%

4x more throughput after upgrading the link
with Wavence microwave transport solution

GLOBAL PERSPECTIVE

Preserving nature while connecting communities

Connecting such a location is about more than extending network coverage. It is about ensuring that modern technology coexists with one of the Kingdom's most vibrant ecosystems. The establishment of a robust, high-reliability microwave link now allows Farasan to remain globally connected while safeguarding its unique environment, avoiding intrusive infrastructure that might disturb the marine habitat.

From a broader industry standpoint, this achievement underscores a

long-standing strategic priority for Saudi operators: delivering reliability in the most challenging environments. In remote or environmentally sensitive areas, conventional solutions often fall short of expectations. By overcoming these barriers, Zain and Nokia have demonstrated how advanced microwave transport can set a new benchmark, proving that high-performance connectivity and environmental responsibility can advance hand in hand.



For more information, visit our [Microwave transport webpage](#).



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Nokia is a global leader in connectivity for the AI era. With expertise across fixed, mobile, and transport networks, powered by the innovation of Nokia Bell Labs, we're advancing connectivity to secure a brighter world.

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