5G SEAGUL

Building 5G SA Roaming for Cross-Border Mobility



Project Overview

A1 International Business worked with A1 Bulgaria as its international wholesale carrier and IPX provider, collaborating with COSMOTE Greece and its IPX partner T-Wholesale on cross-border 5G connectivity between Bulgaria and Greece as part of the 5G SEAGUL project.

This EU-funded initiative set out to deliver uninterrupted 5G connectivity across a 473 km corridor, from Sofia through the Promahonas/Kulata border crossing to Thessaloniki and Athens to support five defined use cases.

Identifying the Roaming and Signaling Requirements

SECURE SIGNALING

5G SA-specific SEPP-to-SEPP communication and N32 interface configuration aligned between operators.

TRUST MANAGEMENT

TLS certificates exchanged, installed and managed correctly to support secure authentication between 5G SA networks.

ROUTING AND REACHABILITY

IPX routing, firewall rules, and connectivity to support reliable signaling traffic between roaming partners.

SERVICE CONTINUITY TESTING

Testing to show how connectivity behaved as use case-specific services moved between international networks.

5G SA READINESS

Managing still evolving SIM provisioning, roaming slice setups, multivendor interoperability, and 5G Core dependencies.

MULTI-TEAM COORDINATION

Aligning multiple operators, roaming partners, vendors, and technical teams to manage parallel workstreams.

SEAGUL'S 5G SA ROAMING USE CASES

Packet-switched voice | Video calls | Video streaming | Real-time data sharing | Transport safety and logistics | Future Autonomous Mobility

Deploying a Solution

A1 International Business supported A1 Bulgaria's side of the secure roaming interconnection, with a solution built on its established fiber backbone network in Europe.

DEFINE ROAMING REQUIREMENTS

Working with operators and partners, the team mapped what each mobility scenario needed, then defined signaling, routing, and security requirements for service continuity.

CREATE SECURE REACHABILITY

The project involved setting up the IPX and signaling configuration needed for 5G SA roaming: SEPP-to-SEPP communication over existing IPX links, aligned N32 interfaces, and firewall and routing rules for reliable signaling traffic between partners.

SECURE ROAMING CONNECTIONS

By managing the TLS certificates, A1 International Business cut the risk of manual configuration errors and supported secure authentication between operators.

USE-CASE-SPECIFIC TESTING

The trials involved multiple rounds of 5G signaling tests, drawing on earlier 5G SA trials to track how signaling, SIM provisioning, and network slicing performed across borders.

COORDINATE TESTING AND DELIVERY

Multiple workstreams ran in parallel, so alignment with the other operators, roaming partners, vendors, and engineering teams was critical. A dedicated delivery team kept them moving towards the goal.

"SEAGUL started with a clear objective and the project proved that 5G SA roaming can work where it matters most: live, across borders, supporting services a moving vehicle depends on. Not only this, but the signaling and roaming layer established through the project is now a practical template for commercial cross-border mobility that we can replicate across Europe."

Peter Ziegelwanger,
Head of Technology & Operations, A1 International Business

