



NOKIA

Simplifying legacy core network architectures and integration with 5G

N7/N40 interface enhancements to support GERAN and UTRAN (NIESGU)

Use case

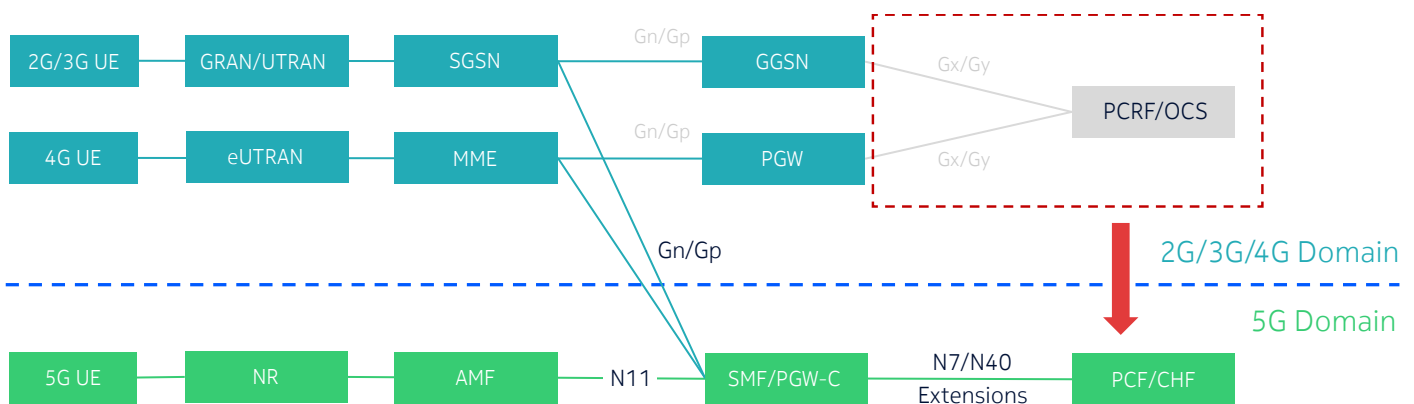
CSPs are currently undergoing a transformative phase as they upgrade their networks to support the latest 5G Standalone (SA) architecture. However, they are also faced with the challenge of simultaneously maintaining and operating existing legacy networks and services until these can be phased out. To address this situation in a cost-effective manner, CSPs can reduce redundancies by deploying the NIESGU solution, which integrates 5G with legacy networks.

Multi-generational network challenges

5G networks are renowned for their advantages in terms of performance, flexibility, and openness. However, during the transition phase, certain redundancies may arise when coexisting with legacy technologies. If 2G, 3G or 4G networks are still in existence upon the deployment of 5G (SA), it would be preferable to employ a single node that combines Session Management Function (SMF) and Packet Gateway for the Control plane function (PGW-C) to cater to all users across all concurrent networks. The challenge lies in the fact that the Policy Control and Charging interfaces differ based on the current 3GPP specifications.

N7/N40 Interface Enhancement for GERAN/UTRAN (NIESGU)

The Nokia NIESGU solution allows the legacy network to operate with 5G Policy and Charging functions through a single Packet Core. Based on 3GPP Release 17 standard, Nokia enables the use of the N7 interface for policy control and N40 interface for charging functions for both GSM Edge RAN and Universal Terrestrial RAN (GERAN/UTRAN) access, in addition to LTE. This allows the consolidation of PGW with SMF, the Policy and Charging Rules Function (PCRF) with 5G's Policy Control Function (PCF), and Online Charging Systems (OCS) with 5G's Charging Function (CHF). At the same time, signaling using legacy interfaces such as Gx, Gy and Sy are removed.



3GPP TS23.501, TS23.502, TS29.503



Benefits of NIESGU

CSPs can gradually eliminate separate legacy policy management and charging control entities like PCRF and OCS/OFCS when 5G SA is deployed, while still supporting 2G, 3G and/or 4G. This reduces the complexity of the architecture, simplifies network deployment, and significantly reduces OPEX and CAPEX.

The role of the Cloud Packet Core

The Nokia Cloud Packet Core (CPC) is based on a container network function (CNF) solution that offers a convergent platform capable of supporting fixed, 2G/3G/4G, and 5G connections. This convergence simplifies the network architecture and allows communications service providers (CSPs) to fully leverage the optimizations provided by NIESGU. By adopting the Nokia CPC, CSPs can streamline their network operations, reduce complexity, and maximize the benefits of network simplification for OPEX optimization.

Simple savings

Network simplification and OPEX optimization are crucial factors for CSPs when making decisions about deploying 5G networks. NIESGU plays a significant role in achieving these objectives by reducing the number of network functions and integrating legacy technologies with 5G. In this context, the Nokia Cloud Packet Core provides an ideal solution for CSPs with its container-based architecture, convergence capabilities, and ability to support NIESGU.

Why Nokia?

Nokia provides end-to-end network solutions to a wide range of customers and deploys complex and complete networks including multi-vendor environments. With a world-leading and innovative technology portfolio, we partner with communications service providers around the world to ensure they deliver outstanding services to their customers.

About Nokia

At Nokia, we create technology that helps the world act together.

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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