



Ensure reliable services with 5G core load balancing



Background

Communication Service Providers (CSPs) can win new business with advanced offers using 5G's ultra-low latency, end-to-end slicing and massive scalability. These services rely on a 5G core that uses cloud and IT principles in a flexible, service-based architecture. Managing the signaling between 5G core network functions is critical, especially for load balancing to ensure efficient use of capacity and reliable delivery of services.

Challenge

As 5G networks evolve to offer more advanced capabilities, CSPs must ensure the 5G core can deliver reliable, high-performance services. Yet the cloud-native 5G core introduces complex signaling demands. Diverse services require different core function capacity and loads are constantly changing.

Loads need to be balanced between Network Functions (NFs) as their capacity is consumed and demand continuously scales up and down. It's essential to use all core capacity efficiently and avoid excessive loading of any NFs that could cause service interruptions.

A well-balanced 5G core distributes loads to ensure sufficient capacity is always available to support all services. Furthermore, unequal loading can significantly damage the customer experience across multiple services should a heavily loaded network function fail.

Solution

Nokia Cloud Signaling Director (CSD) incorporates a 5G core network entity called the Service Communication Proxy (SCP). Standardized in 3GPP Rel. 16, the SCP reduces the complexity of interconnection between multiple 5G NF instances and provides service-level load balancing.

The SCP acts as an intermediary between services and NF instances. This avoids the need for NFs to communicate directly with each other; they only need to communicate with the SCP. In this intermediary position, the SCP gains awareness of content, performance and trouble spots in the control plane, enabling it to take work requests and balance loads across all NFs.

As a high capacity SCP, the Nokia Cloud Signaling Director provides optimized load balancing of the cloud-native 5G core network for reliable services and efficient use of resources

Benefits

As 5G networks grow, the SCP becomes an essential entity to achieve effective load balancing in the cloud-native core network.

- Avoiding NF overloads helps ensure reliable, high-performance customer experiences
- Balancing of demand on NF service instances helps achieve faster time to market of new services and upgrades
- Load balancing increases core network efficiency because instantiated NFs are more fully used.

Results

With the Nokia Cloud Signaling Director providing a full featured, high capacity SCP function in the 5G core, loads are distributed properly among NFs. The network

operates more efficiently, getting maximum capacity from the deployment and eliminating bottlenecks. Network reliability is also enhanced because load balancing removes potential failures due to overloaded network functions.

In a Service Based Architecture, new NFs may be added or old ones removed. When this occurs, the Cloud Signaling Director decides how the demand should be routed to rebalance the network. Such service level traffic control cannot be achieved easily without the SCP.

Discover more about how the Nokia CSD simplifies the complexity of cloud-native 5G core signaling to achieve the highest levels of reliability and performance.

Visit our website for 5G Signaling
www.nokia.com/networks/5g/5g-signaling/

Visit our website for Nokia CSD
www.nokia.com/networks/products/cloud-signaling-director/

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