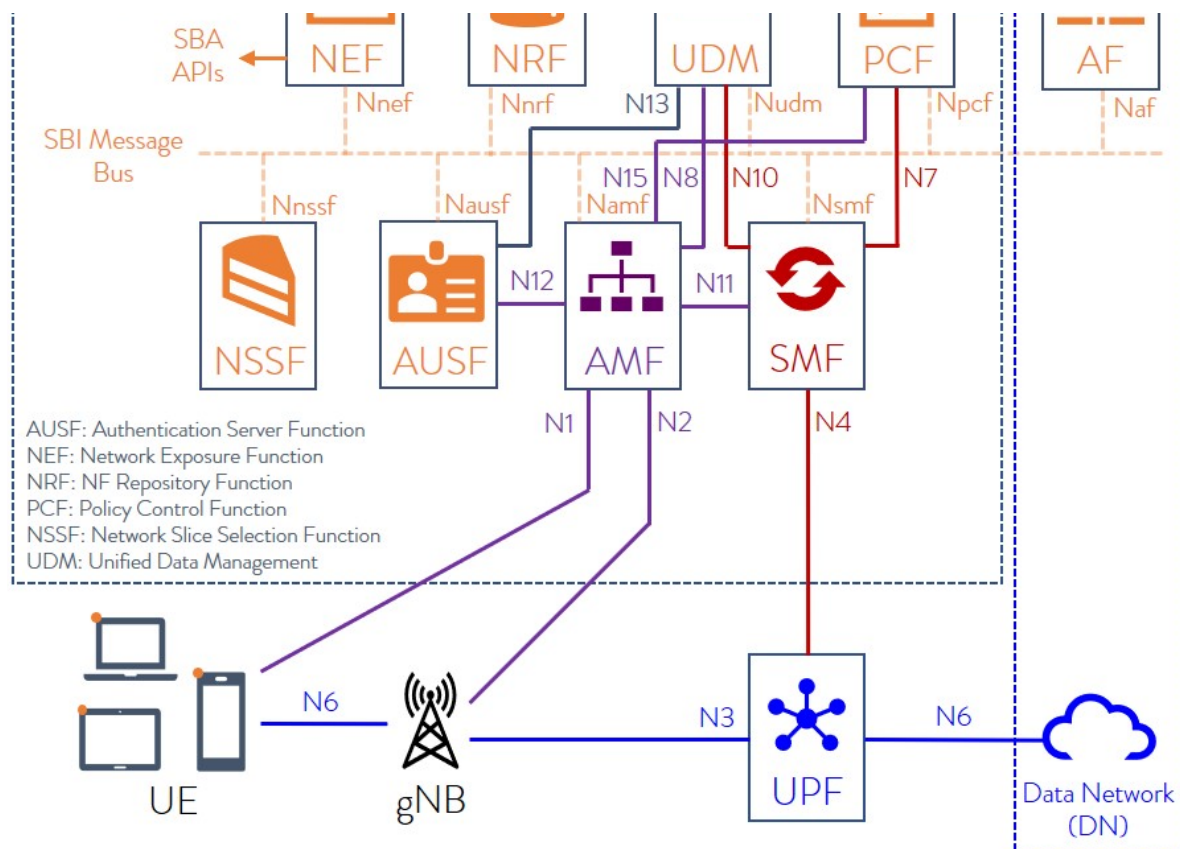


# What is the 5G Service-Based Architecture (SBA)?

**Topics** [Mobile Infrastructure](#), [Cloud Native](#), [5G](#)

Service-Based Architectures provide a modular framework from which common applications can be deployed using components of varying sources and suppliers. The 3GPP defines a Service-Based Architecture (SBA), whereby the control plane functionality and common data repositories of a 5G network are delivered by way of a set of interconnected Network Functions (NFs), each with authorization to access each other's services.



Assuming the role of either service consumer or service producer, Network Functions are self-contained, independent and reusable. Each Network Function service exposes its functionality through a Service Based Interface (SBI), which employs a well-defined REST interface using HTTP/2. To mitigate issues around TCP head-of-line (HOL) blocking, the **Quick UDP Internet Connections (QUIC)** protocol may be used in the future. The 5G SBA comprises numerous components, including:

## What is the NF Repository Function (NRF)

With Network Functions built using microservice methodologies, the 5G Service Based Architecture will ultimately evolve into a complete service mesh with service discovery, load balancing, encryption, authentication and authorization, employing a sidecar for interservice communication. Currently, however, the Service-Based Architecture employs a centralized discovery framework that leverages a NF Repository Function (NRF). The NRF maintains a record of available NF instances and their supported services. It allows other NF instances to subscribe and be notified of registrations from NF instances of a given type. The NRF supports service discovery, by receipt of Discovery Requests from NF instances and details which NF instances support specific services.

## What is the Network Slice Selection Function (NSSF)

Network slicing is a fundamental new capability of 5G infrastructures, bringing a high degree of deployment flexibility and efficient resource utilization when deploying diverse network services and applications. A logical end-to-end network slice has pre-determined capabilities, traffic characteristics and service level agreements and

The Access and Mobility Management Function (AMF) instance serving a piece of User Equipment (UE) is common to all Network Slices that UE is a member of. This is currently limited to eight. Identification of a Network Slice is via the Single Network Slice Selection Assistance Information (S-NSSAI). The Network Slice instance selection is triggered by the first AMF that receives a UE registration request, which then retrieves the permitted slices from the Unified Data Management (UDM) element and then requests an appropriate Network Slice Instance of the NSSF.

## What is the Unified Data Management (UDM) Service

The UDM provides services to other SBA functions, such as the AMF, SMF and NEF. The UDM is typically recognized as a stateful message store, holding information in local memory. The UDM, however, may also be stateless, storing information externally within a Unified Data Repository (UDR). The UDM is analogous to the Home Subscriber Server (HSS), providing authentication credentials while being employed by the AMF and SMF to retrieve subscriber data and context.

## What is the Policy Control Function (PCF)

The Policy Control Function (PCF) supports a unified policy framework, within the 5G infrastructure, for governing network behavior. The PCF accesses the subscription information, required to make policy decisions, from the UDM and then provides the appropriate policy rules to the control plane functions so that they can enforce them. The PCF is analogous to the PCRF in EPC architectures.

## What is the Service Communication Proxy (SCP)

Appearing in the second specification iteration of 5G, or release 16 in 3GPP parlance, the Service Communication Proxy (SCP) was defined within TS23.501 - System architecture for the 5G System. It's the sort of function that is born of necessity. The SCP is not required to make a 5G SBA work but is required to make it work in a highly distributed multi-access edge compute cloud environment. The Service Communication Proxy provides a single point of entry for a cluster of network functions, once they have been successfully discovered by the NRF. This allows the SCP to become the delegated discovery point in a data center, offloading the NRF from the numerous distributed services meshes that would ultimately make-up a network operator's infrastructure. Together with the NRF, the SCP forms the hierarchical 5G Service Mesh.

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