Architecture Principles agreed by NGMN P1-End-to-End Architecture Framework project

by NGMN Alliance

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1 NETWORK SLICING

The scope of a network slice covers the device right through to the SGi interface. The 5G network shall be capable of slicing by service category (MIoT, URLLC, Automotive, eMBB, etc.).

Service categories may be sliced further. How far each service category is sliced is an operator decision.

A device is allowed to connect to a single network slice if it is a dedicated device. If services are separated at lower granularity (i.e. speech and MMTEL for smartphones) then the same device may connect to more than one slice.

More than one device type may connect to the same network slice (e.g. sensors and infotainment devices for automotive).

The 5G system shall allow a common core network associated with one or more access networks to be part of a network slice (e.g. fixed and mobile access within the same network slice).

A Network Slice includes the following scenarios:

a) Control Plane functions associated with one or more User Plane functions (e.g. common framework of control),
b) Service or service category specific Control Plane functions and User Plane function pairs (e.g. user specific multimedia application session).

A device may connect to more than one slice. When a device accesses multiple network slices simultaneously, a control plane function or a set of control plane functions should be in common and shared among multiple network slices, and their associated resources.

2 ACCESS NETWORKS

The 5G core network will support multiple access networks including both fixed and mobile. FMC is considered important (covered by requirements in all the following sections).

The 5G system will include macro and small cell radio access deployments

The 5G system will support the use of non-3GPP access for off-load and for continuity of service.

3 MULTIPLE CONNECTIVITY

Multiple-connectivity (e.g. different types access technologies, or different links associated with the same access technology), where available, shall be supported to optimize resource allocation and signalling.

4 ANCHOR POINTS

The 5G system will provide termination points or points of attachment in the core, for both control plane and user plane information. These points are selected based on location, mobility, and service requirements. They may dynamically change during the lifetime of a service flow based on the aforementioned requirements. To achieve a converged core network, common mechanisms of attachment should be supported for both 3GPP and non-3GPP access networks.

The 5G system will allow simultaneous multiple points of attachment to be selected per device, on a per-service flow basis.

5 SUBSCRIBER AUTHENTICATION

The 5G system shall support an access agnostic subscriber authentication framework.

> *n.b. "framework" gives freedom for equivalent solutions, not implying they need to be identical.*

The 5G system will support a unified subscriber profile.

The 5G system will support common identity management, enabling a single identifier to be used for all service and access types.

6 POLICY

The 5G system will support a common policy framework.

The 5G system will support network policies that allow the device to choose the most suitable access network available

7 QOS

The 5G system shall support a common quality of service framework. The common framework shall be access aware to enable conformance to service related QoS demands. In scenarios where more than one type of access (e.g. wireless, wired) is available, the choice of access hinges on the optimum (e.g. link conditions, efficiency, performance, policy etc.) suitability to satisfy QoS demands. The non-3GPP access solution could be a subset of the 3GPP access solution

The 5G system shall support an access agnostic quality of service mechanism, for non-GBR flows.