Dedicated Networks API Proposal

Outline

- Background: What is a Dedicated Network?
- Dedicated Network realization options
- Use-Cases
  - Media Production
  - Festival Organizer
  - Enterprise Connectivity

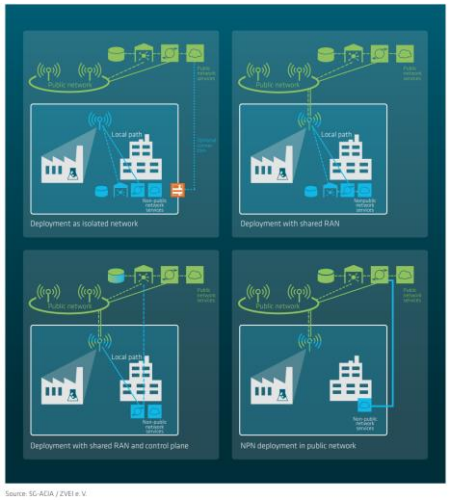
Dedicated Networks

- Fixed and Mobile Networks offer the capability of separating devices in different (logical) dedicated networks.
  - Multiple of these (logical) dedicated networks can exist on the same physical network
  - Dedicated Networks can offer different performance targets, e.g. speed/ latency
  - Dedicated Networks are often only needed for a specific time duration (e.g. one hour) and at specific locations (e.g. the area of a festival)
  - Dedicated Networks separate target traffic from other traffic for enhanced security

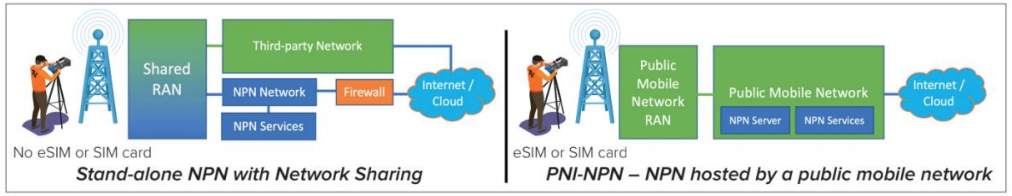
- A dedicated network offers connectivity for multiple devices
  - A device connection activation functionality is included, which allows controlling, which devices are allowed within the dedicated network
  - Connectivity (routing and performance) may be individually managed for each device

Dedicated Networks

- 3GPP TS 23.501 defines "Non-Public Networks"
  - Standalone NPN (SNPN)
  - Public Network Integrated NPN (PNI-NPN)
    - Dedicated DNN or Network Slice instances



Dedicated Networks in 5G-ACIA
Source: WP - NPNs for Industral Scenarios (Link)



Dedicated Networks in 5G-MAG
Source: Explainer - 5G NPNs for media production in collaboration with third-party networks (Link)

- GSMA OPG.02 v06 (Annex H) defines a "Network Communication Service as a Service"
  - Considers 5G-SA (NS and DNN), 5G-NSA (DNN only) and 4G (APN only)

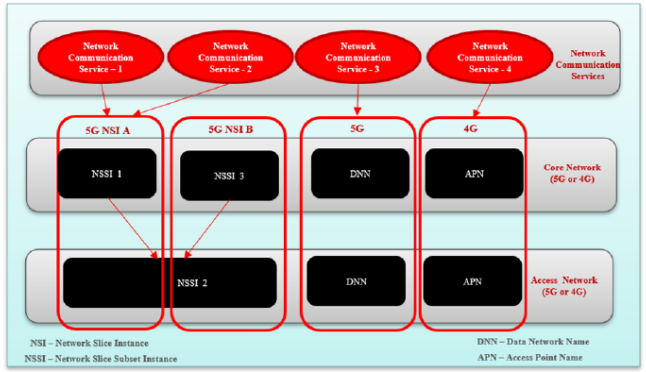


Figure 38: A variety of services provided by multiple network slices [34]

Dedicated Networks in GSMA OPG.02
Source: GSMA Operator Platform: Requirements and Architecture (Link)

Dedicated Networks – realization options

- The API should be agnostic to the underlying realizations

- Within Cellular networks, it can be realized as
  - (Public Network): A Network Slice (with a DNN) or just with a DNN / APN
  - (Public Network): A new Network Slice / DNN for each Dedicated Network (Dynamic slice creation) or re-used of an existing Network Slice / DNN (usage of a static Slice)
    - It should be transparent for the API consumer, whether resources are re-used or not

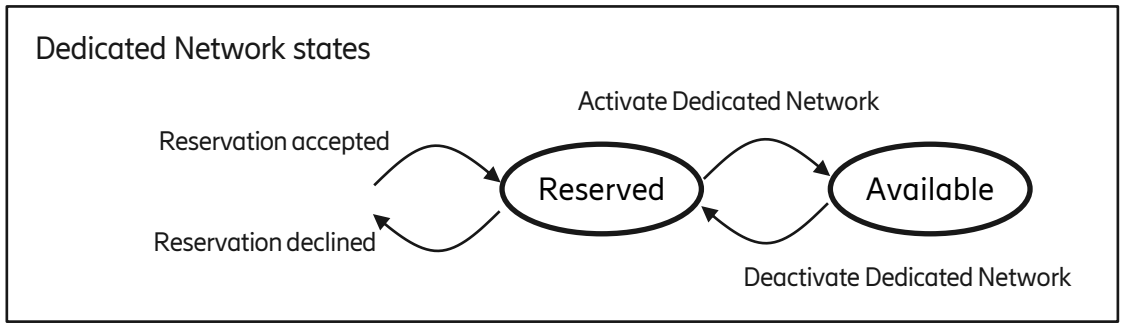
- Dedicated networks can also exist on other networks like fixed networks

Dedicated Network - Lifecycle

Initial Draft

- A dedicated network has different states
  - Reserved:
    - After some assessment, the reservation request (with its input parameters) has been accepted.
    - When the assessment fails, the reservation request is declined, potentially with some change hints
    - The network resources associated to the dedicated network are not usable while the dedicated network is in "Reserved" state
  - Available:
    - At reservation start-time, the dedicated network becomes available in the defined service area and the defined characteristics. Associated network resources are usable for devices within the service area.
    - At reservation end-time, the dedicated network becomes un-available. Associated network resources are not usable anymore for devices inside the service area.

- Devices can be added & removed in reserved and in available state (no practical effect in reserved state, since no network resources usable)



Relation to other CAMARA APIs

- The relation to the QOD API: The Dedicated Networks API focuses on the reservation aspects in terms of “when”, “where” and “what/how much”. The QOD API focuses on a single device or even a single connection of a device and it be complemented by the Dedicated Networks offering.
- The relation to the Network Slice Booking API can be seen as following: The Dedicated Networks API is agnostic to the underlying network realization and allows usage of different mobile and fixed networks. The Network Slice Booking API requires usage of a Network Slice Instance.
- The relation to the Site to Cloud API: The Site to Cloud API focuses on VPN solutions. It is unclear, whether there is a relation or not.
- The relation to the (proposed) Device Management API is a bit unclear. The Dedicated Networks API includes device activation aspects, controlling whether a device (with a valid SIM) has access to the Dedicated Network or not. The Device Management API influences the Device Subscription State (without defining the meaning of a state).

Use-Cases: Media Production

- Multiple Cameras are used within a confined area & time
  - Example: Press-briefing, where a single media producer deploys multiple cameras. The cameras may not be active all time during the event.
  - The media producer is interested to obtain a dedicated network from a public network (with an SLA)

- At time of planning
  - The media producer is planning the event, e.g. how many cameras are needed. The media producer knows, “where” (location) and “when” (time) the event will be
  - API Input
    - The needed performance (capacity), service area, service time
    - Expected number of cameras (active, in-active or standby)
  - When accepted: A dedicated network is reserved some time before the event, a dedicated network identifier is returned, e.g. to later connect the devices...

- Only selected / authorized cameras are permitted in the dedicated network (Device Activation)
  - The media producer permits devices (subscription) to access the dedicated network
  - Device are typically prepared before the event.

Use-Case: Festival

- A dedicated network is used to connect devices (like a Credit Card readers), needed for running the festival
  - Note, the dedicated network is not intended for festival audience
  - The festival organizer is interested to obtain a dedicated network from a public network (with an SLA)

- At time of planning
  - The festival organizer is planning the festival, e.g. how many Credit Card readers are needed. The festival organizer knows, “where” (location) and “when” (time) the festival will be and is interested getting a dedicated network for enabling the festival
  - API Input
    - The needed performance (capacity), service area, service time
    - Expected number of devices (active, in-active or standby)
  - When accepted: A dedicated network is reserved some time before the event

- Only selected / authorized devices are permitted in the dedicated network (Device Activation)
  - The festival organizer permits devices (subscription) to access the dedicated network
  - Device are typically prepared before the event.

Use-Case: Enterprise connectivity

- A dedicated network is used to connect devices (e.g. Laptops), of employees to corporate services
  - Note, the dedicated network is only intended for the employees, not for guests or others

- At time of planning
  - The Enterprise wants secure access to it's corporate services with an agreed SLA, this is required to work on any 3GPP network.
  - API Input
    - The needed performance (capacity), service area, security level, service time (possibly forever until end of contract)
    - Expected number of devices (active, in-active or standby)
  - When accepted: A dedicated network is reserved at the time indicated by the enterprise

- Only selected / authorized laptops are permitted in the dedicated network (Device Activation)
  - The enterprise permits devices (subscription) to access the dedicated network
  - Device are typically under managed control of the enterprise