IETF Network Slice Application in 5G End-to-End Network Slice

draft-gcdrb-teas-5g-network-slice-application

TEAS WG

November 2022 (IETF 115 London)

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Goal of the Draft

- Network slicing has various use-cases 5G is one of the important application scenarios of IETF Network Slice

- Before IETF 114, authors of previous 5G Network Slice application drafts were asked by WG chairs to provide a merged document to the WG to look to adopt, hence the following new draft :
  - **draft-gcdrb-teas-5g-network-slice-application:** IETF Network Slice Application in 5G End-to-End Network Slice

- Try to answer the following key questions:
  - The role of IETF network slice in 5G network slice
  - The existing 3GPP work that is related to IETF network slice
  - How to map 3GPP network slice to IETF network slice

Framework for IETF Network Slices
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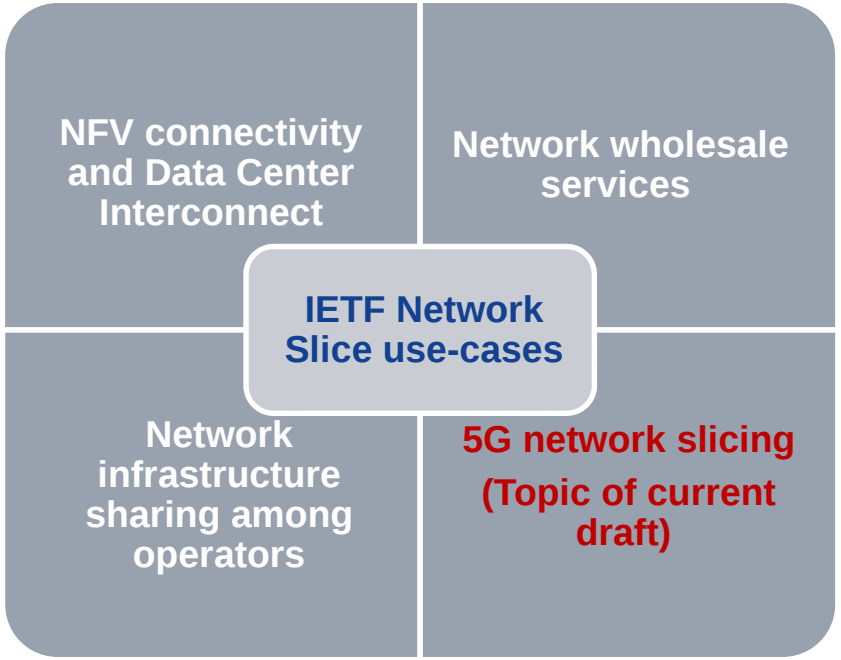


Draft Structure and Progress in version 01

1. Introduction
2. Terminologies
3. 5G End-to-End Network Slice
4. Overview of the mapping between 3GPP and IETF network slices
5. 3GPP Network Slice Mapping Parameters
6. 5G E2E Network Slice Mapping Procedure
   - 5G E2E Network Slice Mapping in Management Plane
   - 5G E2E Network Slice Mapping in Control Plane
   - 5G E2E Network Slice Mapping in Data Plane
7. Example of IETF Network Slice request through IETF Network Slice NBI
8. Gap Analysis

Update figures and terminologies to avoid introducing unnecessary 3GPP concepts

Provide an overview of network slice mapping mechanisms applied in 5G scenarios

Clarify the relationship with IETF Network Slice

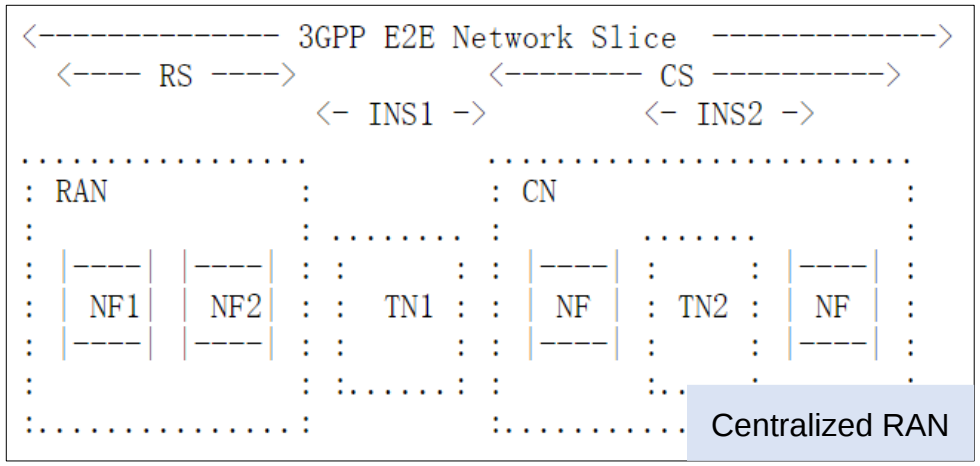
Modify the descriptions and terminology Update

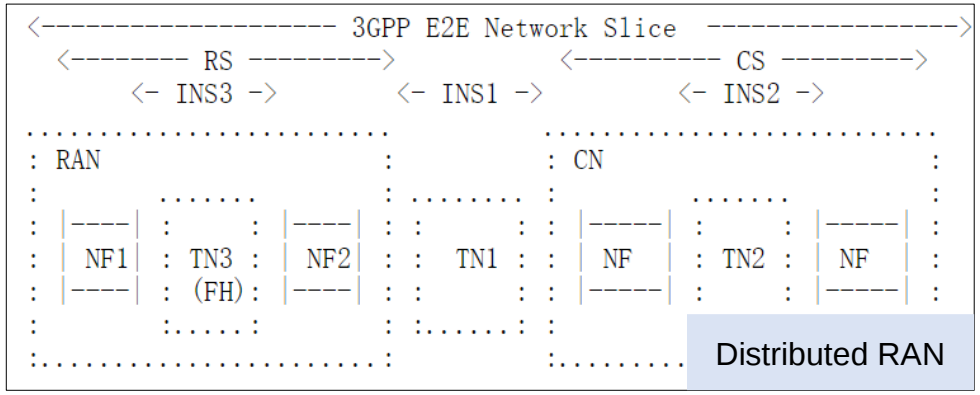
IETF Network Slice in 5G End-to-End Network Slice

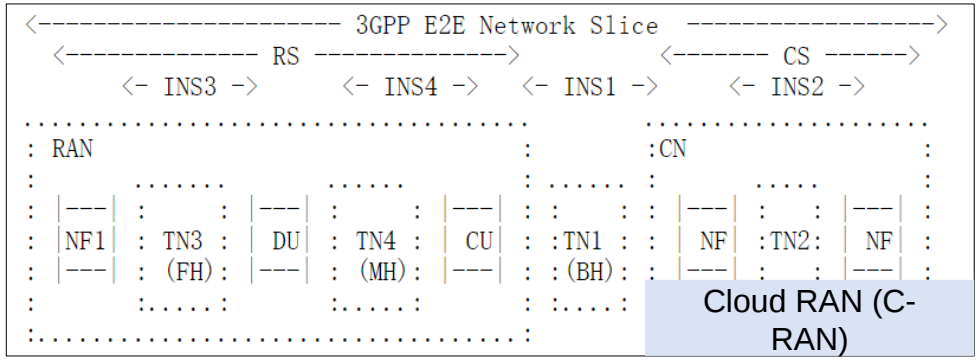
Depend on the RAN technology deployment, the IETF network slices are sets of connections between network functions and mobile applications:

- IETF Network Slices in Distributed RAN deployment
- IETF Network Slices in Centralized RAN deployment
- IETF Network Slices in Cloud RAN (C-RAN)

Open Issue: Is different connection(Fronthaul, Midhaul, Backhaul) between different the network unit defined in 3GPP will affect the network slice mapping?



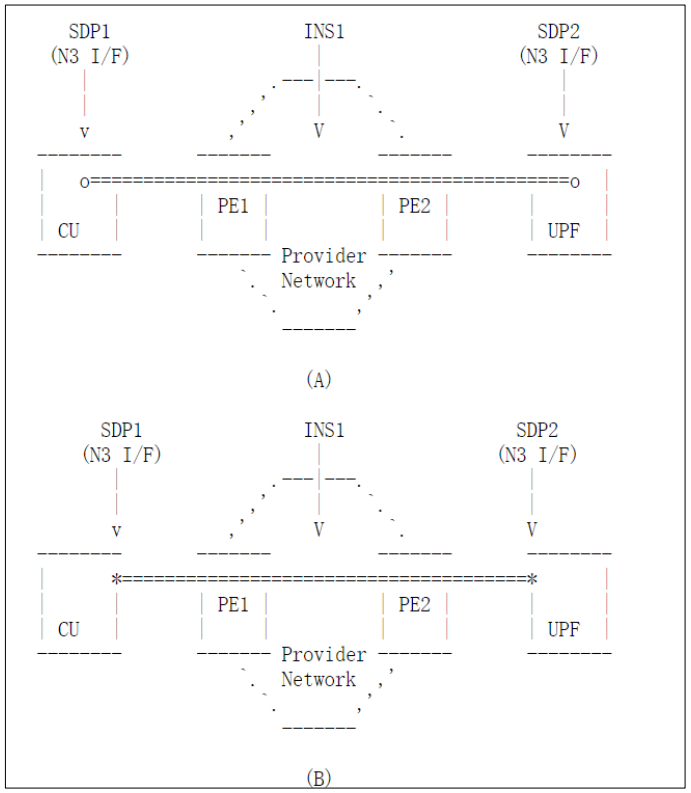


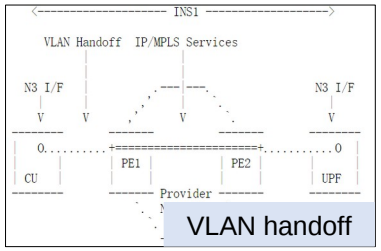


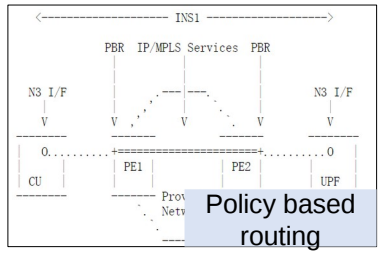
Overview of the mapping between 3GPP and IETF network slices

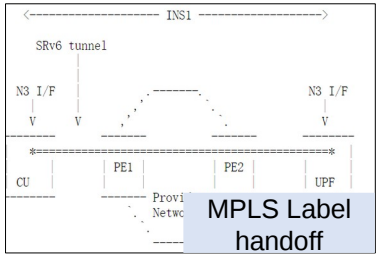
Take connection between RAN and UPF as an example, show the options of realizing 5G E2E network slice mapping:

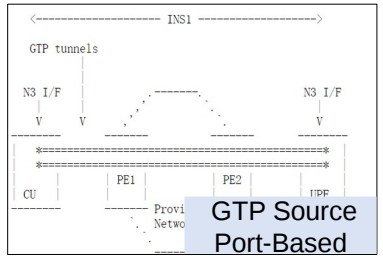
- VLAN handoff
- MPLS label handoff
- SRv6 SID handoff
- Policy Based Routing (PBR)
- GTP-U/UPD source port based

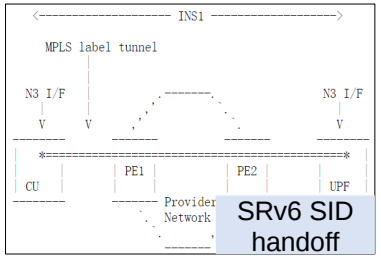


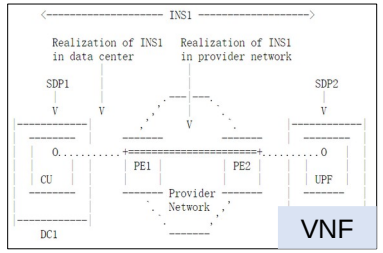










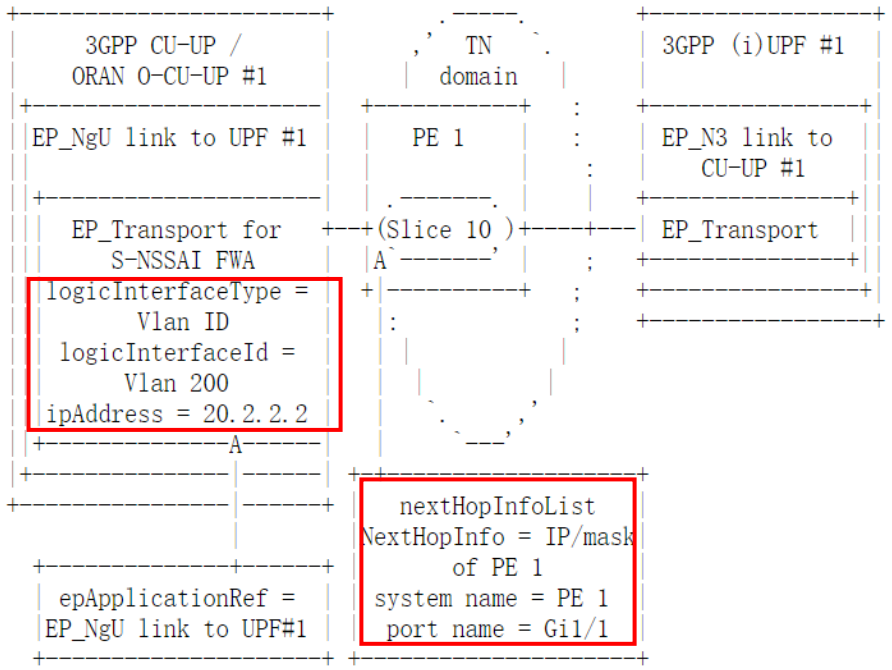


Open Issue: what is the proper name for data plane identification for network slice mapping?
- Handoff ID
- Network Slice Interworking ID

3GPP Network Slice Mapping Parameters

EP_Transport represents the logical transport interface or endpoint which is part of a RAN or CN SubNetwork, including transport level information

- **nextHopInfo** (optional): identifies the ingress transport node. Each node can be identified by any combination of IP address of next-hop router of transport network, system name, port name and IP management addresses of transport nodes.
- **logicalInterfaceInfo** (mandatory): a set of parameters, which includes logicInterfaceType and logicInterfaceId. It specifies the type and identifier of a logical interface. It could be a VLAN ID, MPLS Tag or Segment ID. This is assigned uniquely per slice.



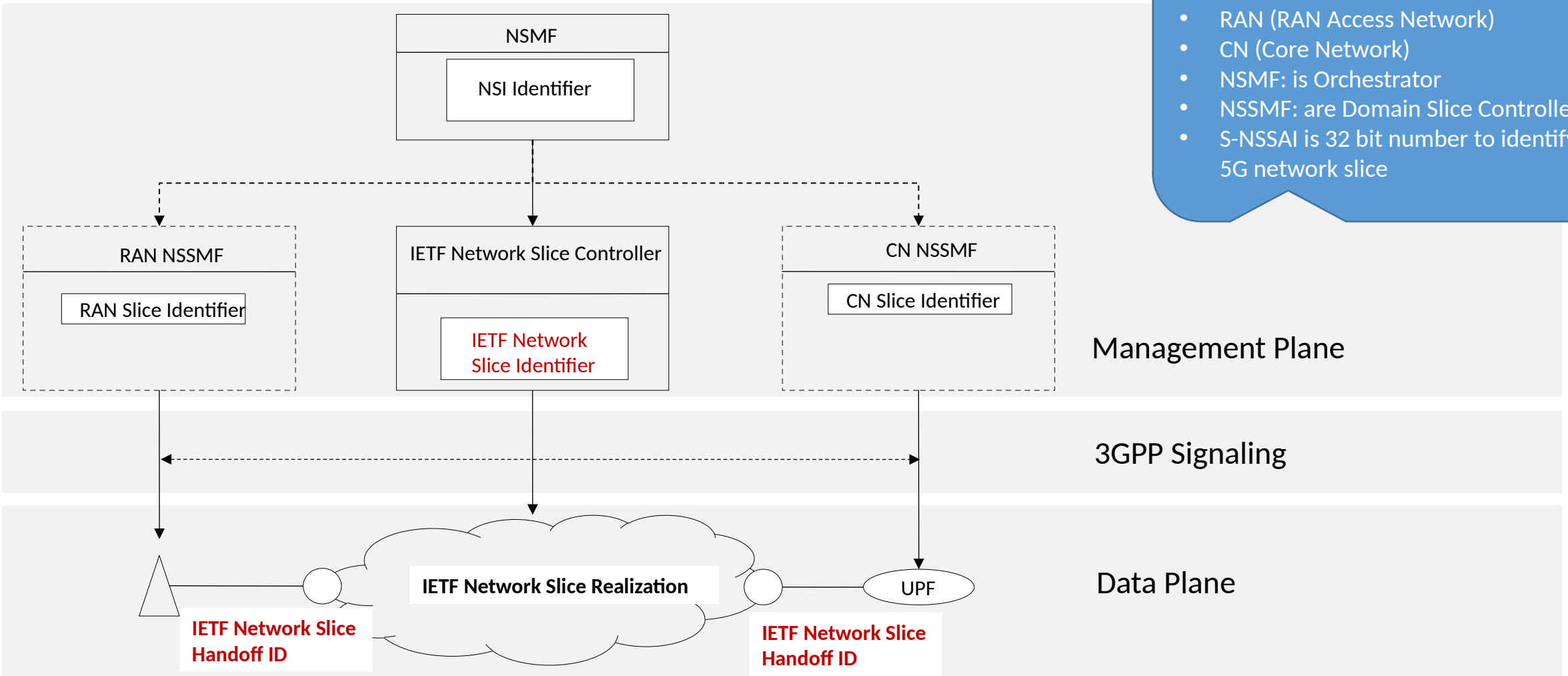
Open Issue: nextHopInfo is unique for 3GPP network slice or IETF network slice ?

3GPP EP_Transport

Attribute name	S	value	Value
ipAddress	M	2.2.2.2	1.1.1.1
logicInterfaceInfo	M	vlan 200	vlan 100
nextHopInfo	O	10.2.2.2	10.1.1.1
qosProfile	O	eMBB	eMBB
epApplicationRef	M	DN of NgU endpoint (link) to CU	DN of NgU endpoint (link) to UPF1

Mapping between 3GPP 5G network slice and IETF network slice

Note in 3GPP:
- RAN (RAN Access Network)
- CN (Core Network)
- NSMF: is Orchestrator
- NSSMF: are Domain Slice Controller
- S-NSSAI is 32 bit number to identify 5G network slice



Next Steps

- Request for adoption
- Reviews and comments are welcome
- Weekly Call meetings to refine the document
  - Open to interested people

Thanks