Network Slicing Subnet and EP_RP relation

Samsung

3GPP TS 28.541

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- **[1] Network Slice Subnet and EP Transport in 28.541 6.3.2.1 Definition**
  - The attribute epTransportRef is used to specify a list of EP_Transport instance as transport resources to be aggregated to a NetworkSliceSubnet instance. The MnS consumer determines the EP_Transport instance(s) to support EP_Application instances as part of the NetworkSliceSubnet instance and request the MnS producer to configure the attribute epTransportRef of the NetworkSliceSubnet.
  - The EP_Transport is name contained by SubNetwork, and an EP_Transport instance can be a new instance created for the EP_Application instances as part of NetworkSliceSubnet instance or an existing instance reused for EP_Application instance.

- **[2] Network Slice Subnet and EP Transport in 28.541 6.3.2.2 Attributes**
  - The NetworkSliceSubnet IOC includes attributes inherited from Top IOC (defined in TS 28.622[30]) and the following attributes:

Attribute name	S	isReadable	isWritable	isInvariant	isNotifyable
operationalState	M	T	F	F	T
administrativeState	M	T	T	F	T
nsInfo	CM	T	F	F	T
sliceProfileList	M	T	T	F	T
priorityLabel	O	T	T	F	T
networkSliceSubnetType	O	T	T	F	T
Attribute related to role					
managedFunctionRef	M	T	F	F	T
networkSliceSubnetRef	M	T	F	F	T
epTransportRef	O	T	T	F	T

- **[3] EP Transport in 28.541 6.3.18.1 Definition**
  - MnS consumer can request MnS producer to create an EP_transport instance for one or multiple EP_Application instance(s) of one or multiple NetworkSliceSubnet(s).
  - The attribute “epApplicationRef” is used to specify a list of EP_N3 instances and EP_NgU instances aggregated to the EP_transport instance.
  - MnS consumer can obtain all the information of the EP_Transport associated to a NetworkSliceSubnet from MnS producer and send to corresponding TN Management System as transport network related requirements.

- **[4] EP Transport in 28.541 6.3.18.2 Attributes**
  - The EP_Transport IOC includes attributes inherited from Top IOC (defined in TS 28.622[30]) and the following attributes:

Attribute name	S	isReadable	isWritable	isInvariant	isNotifyable
ipAddress	M	T	F	F	T
logicalInterfaceInfo	M	T	T	F	T
nextHopInfoList	O	T	F	F	T
qosProfile	O	T	T	F	T
Attribute related to role					
epApplicationRef	M	T	T	F	T

3GPP TS 28.541 (contd…)

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- **[5] EP_RP{NGU/F1U} and EP Transport in 28.541 6.4.1**
  - NOTE 1: There is no direct relationship between localAddress/remoteAddress in EP_RP and ipAddress in EP_transport. While the localAddress/remoteAddress in EP_RP could be exchanged as part of signalling between GTP-u tunnel end points, ipAddress in EP_transport is used for transport routing.

The Note shows that the localAddress/remoteAddress in ER_F1U/NGU is not related with ipAddress in EP_Transport. The earlier forms the GTP-U endpoints and the later can change during the lifetime of a given GTP-U tunnel (e.g, as part of load balancing, redundant transmissions on the transport layer).

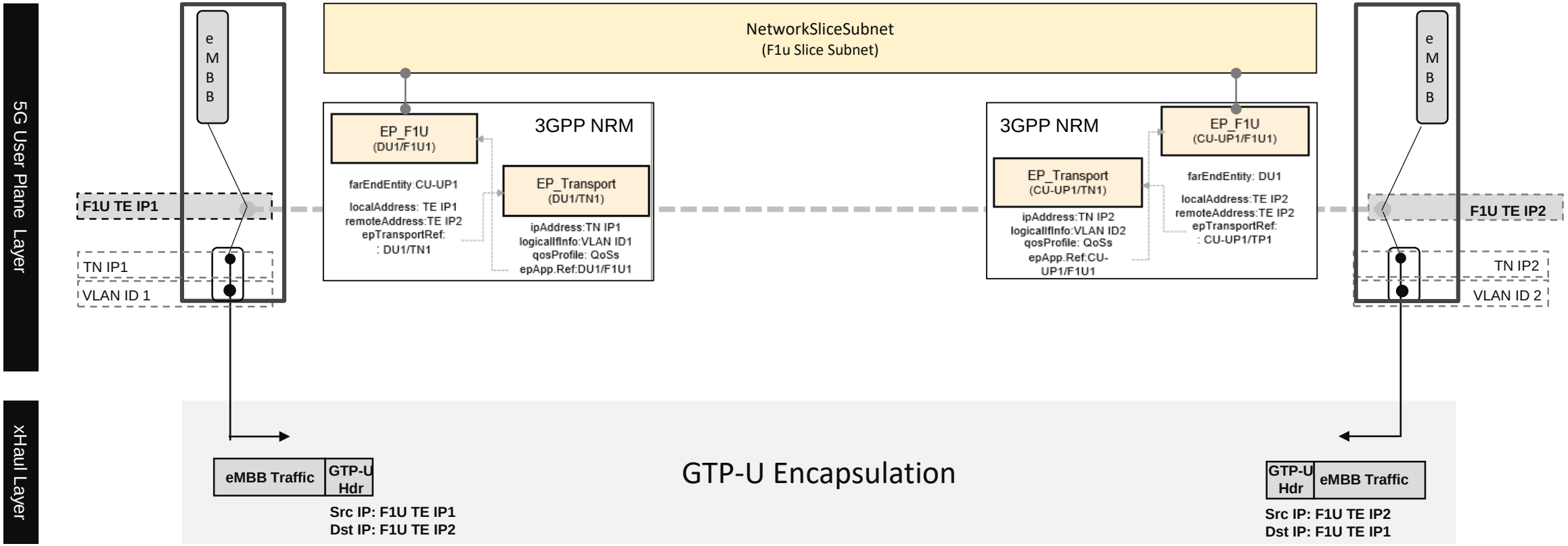
- **[6] EP_F1U in 28.541 4.3.13.2 Attributes**
  - The EP_F1U IOC includes attributes inherited from EP_RP IOC (defined in TS 28.622[30]) and the following attributes:

Attribute name	S	isReadable	isWritable	isInvariant	isNotifyable
localAddress	O	T	T	F	T
remoteAddress	O	T	T	F	T
attribute related to role					
epTransportRef	O	T	F	F	T

- **[7] EP_NGU in 28.541 4.3.11.2 Attributes**
  - The EP_NgU IOC includes attributes inherited from EP_RP IOC (defined in TS 28.622[30]) and the following attributes:

Attribute name	S	isReadable	isWritable	isInvariant	isNotifyable
localAddress	O	T	T	F	T
remoteAddress	O	T	T	F	T
Attribute related to role					
epTransportRef	O	T	F	F	T

Slice F1-U Connectivity Model



- Network slices are created on top of the EP_RP (e.g, EP_F1U or EP_NGU), not on top of the EP_Transport.
- Source and destination ipAddresses of GTP-U traffic are coming from EP_RP, not from EP_Transport. In the network all the GTP-U packets are seen with those source and destination ipAddresses instead of ipAddress in EP_Transport.
- An EP_RP can be shared between Slices and Non-Slices, or dedicated for a specific Slice

NRM Instantiations for Slice F1-U Connectivity Model

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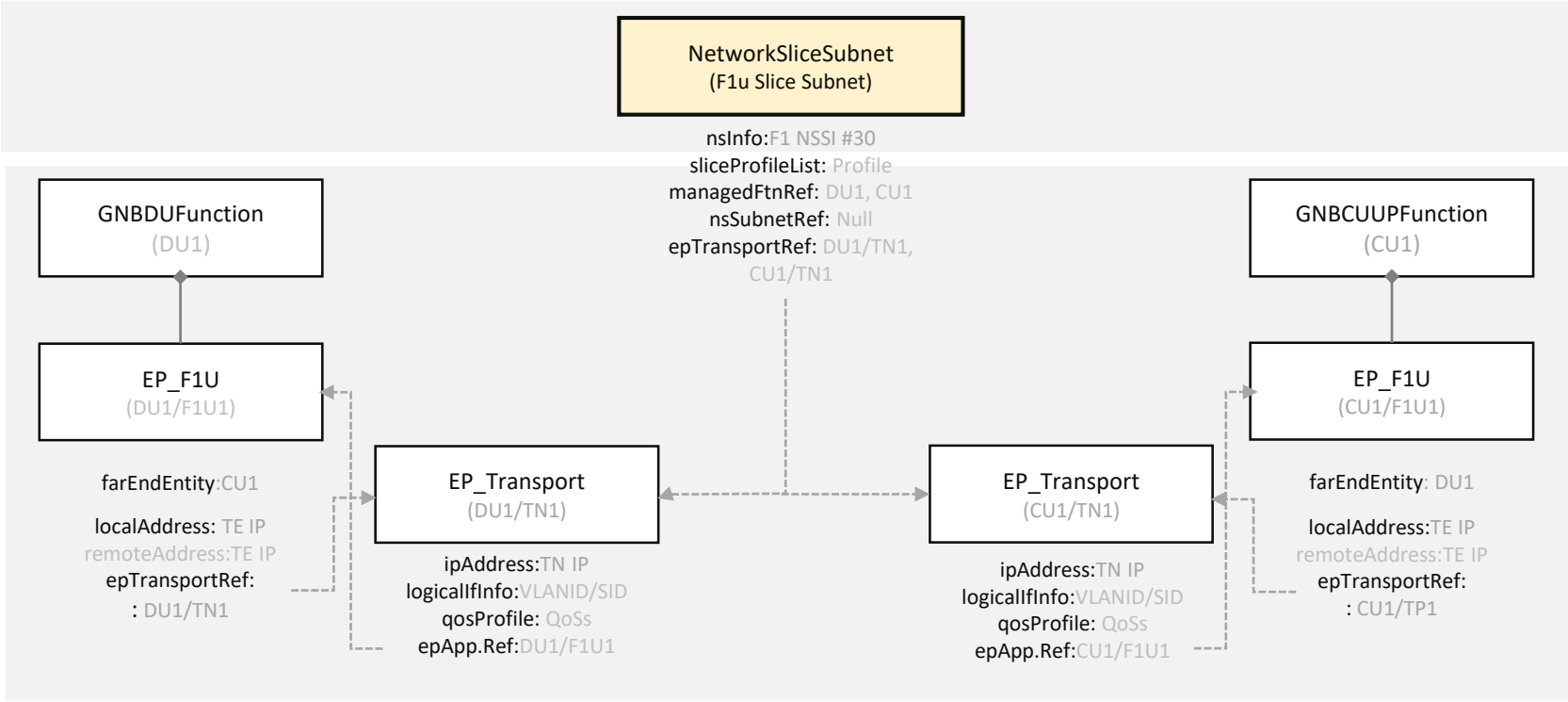
- Problem with current 28.541 NRM
  - Network Slice Subnet has no direct association with its supporting EP_RPs (e.g., EP_F1U, EP_NGU).
    - As depicted in last slide the F1U or N3 slice subnet is created on top of EP_RPs. The path qualities of a slice are being measured between these two endpoints (local/remote address). They are index terms to identify the GTP-U tunnel for gathering and monitoring the statistics related to a given GTP-U tunnel of a slice traffic. Thus, it should be known to the NSSMF for a slice path quality monitoring.
  - All EP_RPs (EP_F1U, EP_NGU, EP_N3) and NetworkSliceSubnet contains the epTransportRef referring to the same EP_Transport instance resulting in redundant information.



Proposed CR to the Current 28.541 NRM

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- A new attribute epApplicationRef is required to be added to NetworkSliceSubnet representing the supported EP_RPs (e.g., EP_F1U, EP_NGU, EP_N3)

Fro Endorsment

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The WG is requested to endorse the changes proposed in slide 6

ANNEX

Non-Slice F1-U Connectivity Model

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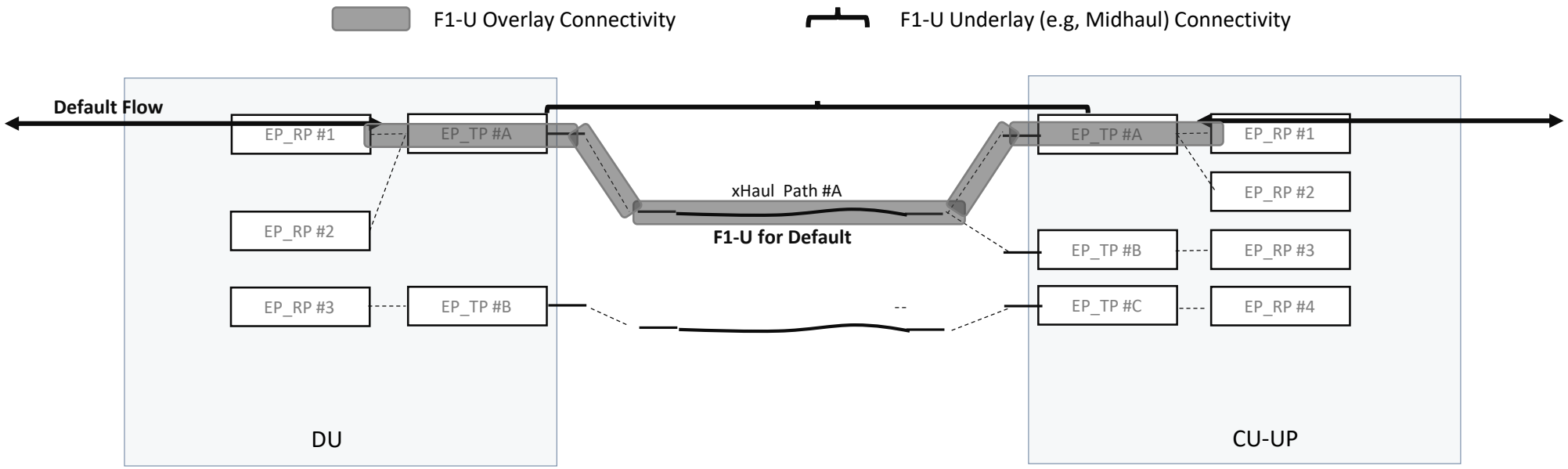
- EP_F1U and EP_Transport: EP_R1U represents F1-U Overlay, whereas EP_Transport represents its underlay



NRM Instantiations for Non-Slice F1-U Connectivity Model

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- Bidirectional associations are setup between EP_RP and EP_Transport with epTransport & epApplication Refs

No problems are identified in a non-slice connectivity model