Mobility Aware Transport Network Slicing for 5G

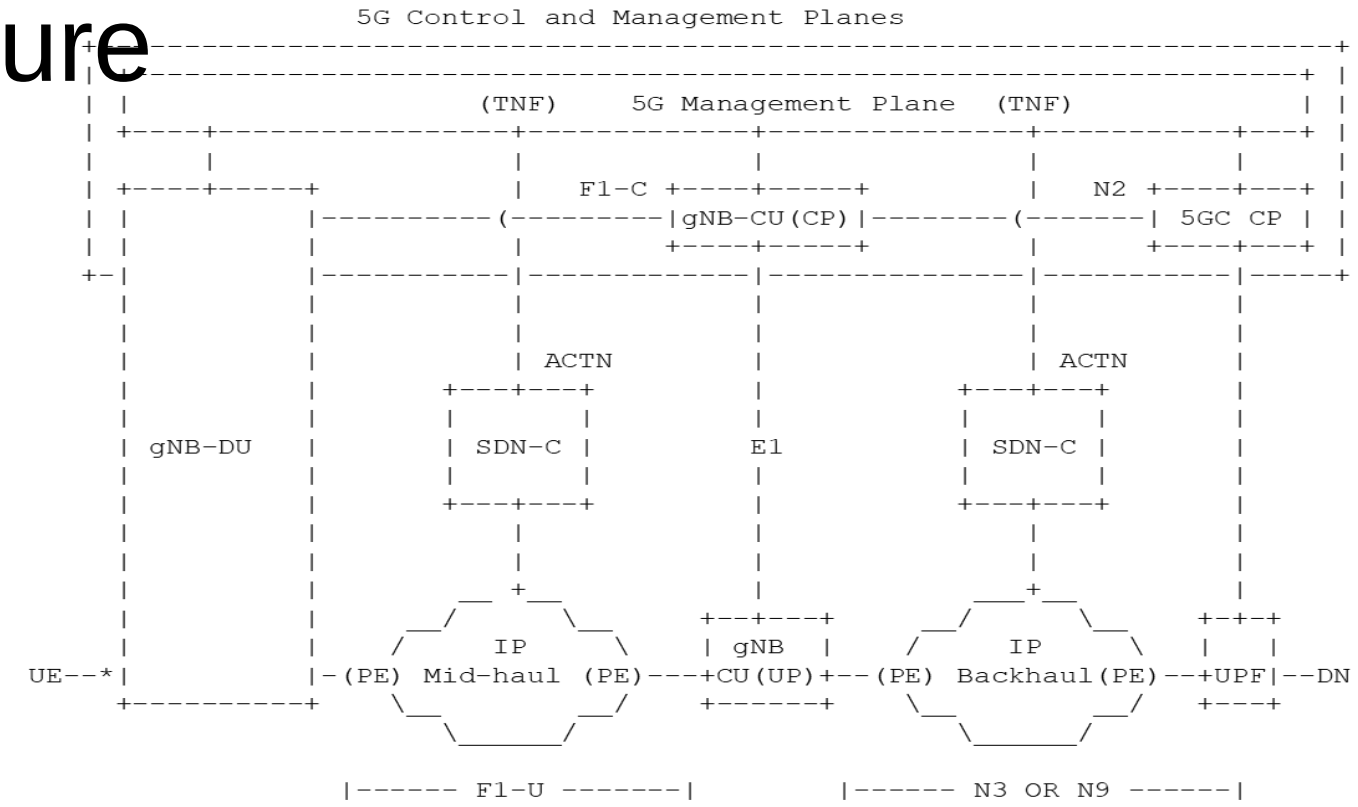
draft-ietf-dmm-tn-aware-mobility-02

Authors: Uma Chunduri, John Kaippallimalil, Sridhar Bhaskaran, Jeff Tantsura, Praveen Muley, Richard Li, Luis Contreras, Xavier De Foy

Updates in draft-ietf-dmm-tn-aware-mobility-01 and 02

- Clarification on Architecture section
- Transport End Point in TS 28.541
- MTNC per Traffic Class and Tenant
- Miscellaneous editorial changes

Clarifies that there is no change to 3GPP Architecture



< Text revision >

2. Transport and Slice aware Mobility in 5G Networks

3GPP architecture [TS.23.501-3GPP], [TS.23.502-3GPP] describe slicing in 5GS **and is provided here for information**.

Transport End Point in TS 28.541

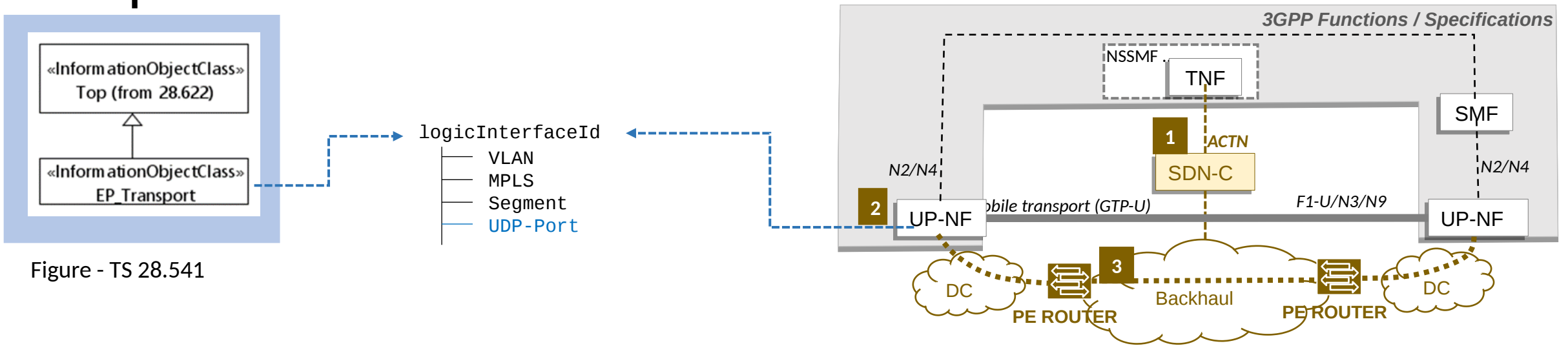


Figure - TS 28.541

< Abstract >

“ .. This document describes how a mobile network slice is mapped to a slice in IP or Layer 2 transport network between 3GPP provisioning end points. ..”

< 1. Introduction >

“ .. IP transport is used to interconnect the data forwarding entities UPFs, gNB-CU and gNB-DU in the 5GC and NG-RAN architecture but 3GPP specifications only define the interfaces (N3, N9, F1U etc.) and the 3GPP transport end points [TS.28.541-3GPP]. ..”

< 2.5 MTNC-ID in the Data Packet >

“ .. 3GPP specifications for management plane defines transport end-points configuration in [TS.28.541-3GPP]. ..”

“ .. The UDP port information containing MTNC-ID is a simple extension that can be provisioned in 3GPP transport end-points defined in [TS.28.541-3GPP]. ..”

MTNC per Traffic Class and Tenant

2.2. Mobile Transport Network Context (MTNC) and Scalability

The MTNC represents a slice of a transport path for a tenant between two 3GPP user plane functions. The Mobile-Transport Network Context Identifier (MTNC-ID) is generated by the TNF to be unique for each instance (for a tenant) and per traffic class (including QoS and slice aspects). Thus, there may be more than one MTNC-ID for the same QoS and instance if there is a need to provide isolation (slice) of the traffic. It should be noted that MTNC are per class/instance and not per user session. The MTNC-IDs are configured by the TNF to be unique within a provisioning domain.

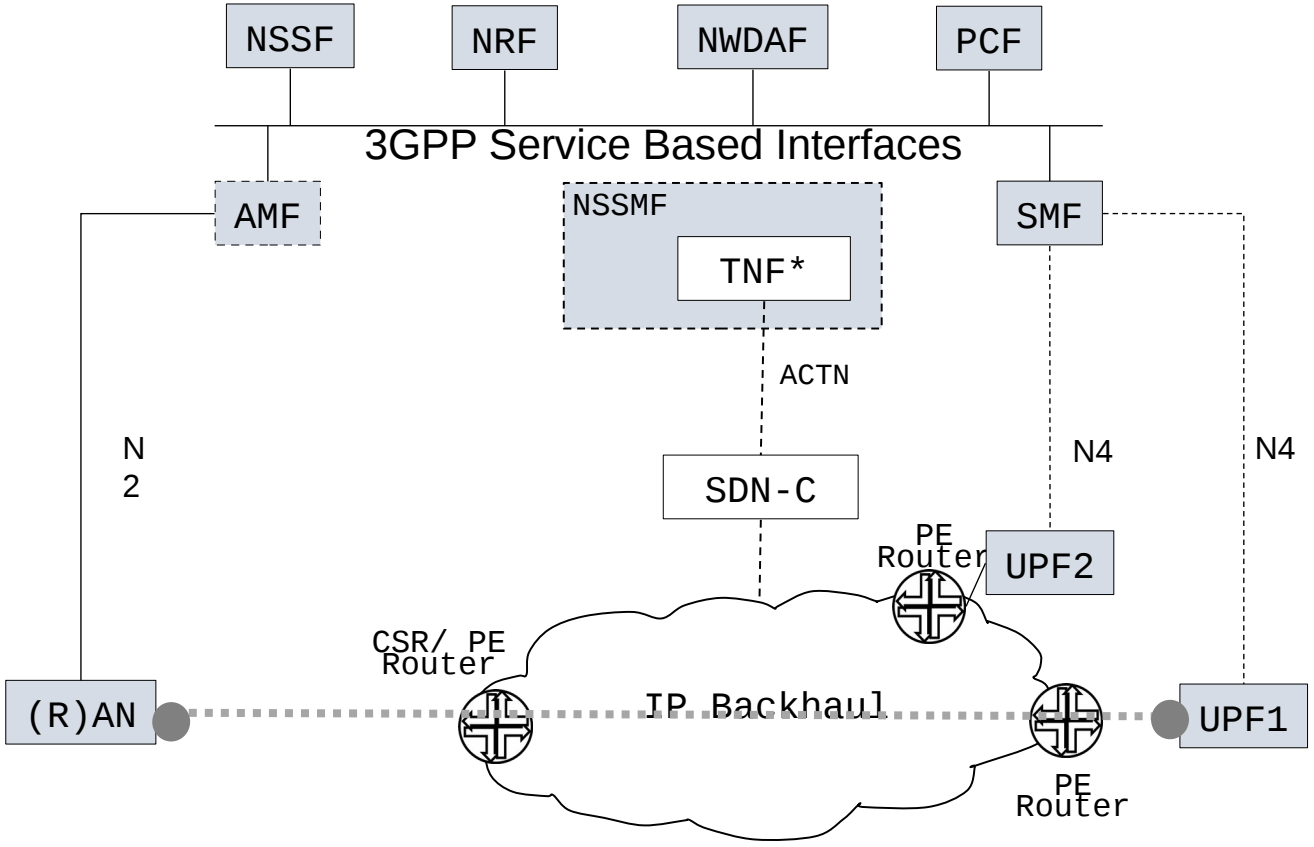
Since the MTNC-IDs are generated per instance / tenant, there is no need for unique MTNC-IDs per flow/session. In addition, since the traffic estimation is performed prior to UE's session establishment, there is no provisioning delay experienced by the UE during its session setup. For an instance/tenant, the MTNC-ID space scales roughly as a square of the number sites between which 3GPP user plane functions have paths. If there are T traffic classes and C Tenants, the number of MTNC-IDs in a fully meshed network is T * C. An MTNC- ID space of 16 bits (65K identifiers) can be expected to be sufficient.

+ Removed text associating transport slice id to a path in the network.

Comments on the draft?

Backup Slides

Solution Approach: Map 5G slice to Transport Network



1. Estimate traffic per slice/path; Provision MTNC Identifier TNF SDN-C PE Router
2. SMF Programs UP-NFs: NSSAI (3GPP slice info) MTNC id
3. UP-NF (RAN, UPF) maps the MTNC id in user plane packets from user
4. PE router inspects mapped slice identifier; grants provisioned transport resources.