Mobility Aware Transport Network Slicing for 5G

draft-ietf-dmm-tn-aware-mobility-09

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Updates in draft-ietf-dmm-tn-aware-mobility-09

IETF has a lot of transport technologies. Why still this draft is stating ppr as the transport?
>> ACTION: Remove PPR.

Do you have any implementation of the udp source mapping for slicing? - No.
>> NO update needed in draft.

Need to work with the transport experts.
>> working with transport/teas experts. Progress of this draft has dependencies with teas 5G slicing drafts.
No update needed.

How about c-plane slice? - the draft text covers the slicing of the control plane as well.
>> ACTION: Add note on Control plane.
Add that a control plane slice, for example, using SCTP (for NGAP) or HTTPS also are covered by using source port.

Is the private network covered? - The draft could be covering both private and public network. But having the discussion offline to figure out if there are any issues.
>> ACTION: Added that it covers both public and private. No specific issues on private have come up.

Overview of changed sections

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Updates: Control plane, private network slices

(1. Introduction)

slice should be mapped to an IP transport slice that offers the corresponding characteristics even after handover.

Different network scenarios and mechanisms to map 3GPP and IETF network slices are found in [I-D.ietf-teas-5g-network-slice-application].

slice should be mapped to an IP transport slice that offers the corresponding characteristics even after handover.

Slicing in this document mainly refers to user plane slices as these are used by the 3GPP network to provide the level of service offered to a user. For example, 5GS that sets up a session for a user for eMBB service would need to provide the guarantees for the service across the user plane segments including F1-U, N3 and N9. During the session setup phase, the control plane signaling may use other 5G provider slices for messages that carry session signaling, or to carry signaling data between 5G network functions. The techniques described here can be applied to control plane in the same manner as it is applied for transport segments of the user plane. The slicing requirements for the control plane are defined by the 5G service provider and not specified by a 3GPP standard. Slice mapping using UDP source port may be used in IP transport networks for public or non public 3GPP networks.

Different network scenarios and mechanisms to map 3GPP and IETF network slices are found in [I-D.ietf-teas-5g-network-slice-application].

Updates: Removed PPR

4. Transport Network Underlays

Apart from the various flavors of IETF VPN technologies to share the transport network resources and capacity, TE capabilities in the underlay network is an essential component to realize the 5G TN requirements. This section focuses on various transport underlay technologies (not exhaustive) and their applicability to realize Midhaul/Backhaul transport networks between 3GPP network functions. Focus is on the user/data plane i.e., F1-U/N3/N9 interfaces as laid out in the framework Figure 1.

4.1. Applicability

* For different slice types, there maybe correspondingly different transport paths. For example, with 3 different SSTs, there are potentially 3 transport TE paths can be signaled from any node in the transport network. For uplink traffic, the 5G-AN will choose the right underlying TE path of the UPF based on the S-NSSAI the PDU Session belongs to and/or the UDP Source port of the GTP-U encapsulation header. Similarly in the downlink direction matching Transport TE Path of the 5G-AN is chosen based on the S-NSSAI to which the PDU Session belongs. The table below shows a typical mapping:

GTP/UDP SRC PORT	SST in S-NSSAI	Transport Path Info	Transport Path Characteristics
Range Xx - Xy X1, X2(discrete)	MIOT	PW ID/VPN info	GBR (Guaranteed

4. Transport Network Underlays

Traffic engineered underlay networks are an essential component to realize the slicing defined in this document. Transport networks should be able to realize midhaul, backhaul and control plane slices shown in Figure 1. This section outlines how GTP/UDP source ports are used to map to slice types. [I-D.ietf-teas-ietf-network-slices] (section 7) describes in more detail how a network work slice can be realized over different transport network technologies including enhanced VPN, IP/MPLS and SR-TE.

An example with different user plane slice types and transport paths is shown in the figure. In this case with 3 different SSTs, 3 transport TE paths are setup. For uplink traffic, an underlying TE transport path may be from a gNB-CU to a UPF for example. A similar downlink path and underlying transport from UPF to gNB-CU is configured. The figure shows UDP port ranges, SST, transport path (in this example pseudowire/VPN) and transport path characteristics.

GTP/UDP SRC PORT	SST in S-NSSAI	Transport Path Info	Transport Path Characteristics
Range Xx - Xy X1, X2(discrete)	MIOT	PW ID/VPN info	GBR (Guaranteed

Only the text relevant to mapping of GTP ports is kept. PPR / transport technology aspects are removed.

Next Steps

Request for WG reviews and last call.

Backup

Slice Configuration (section 3.4, Fig 2)

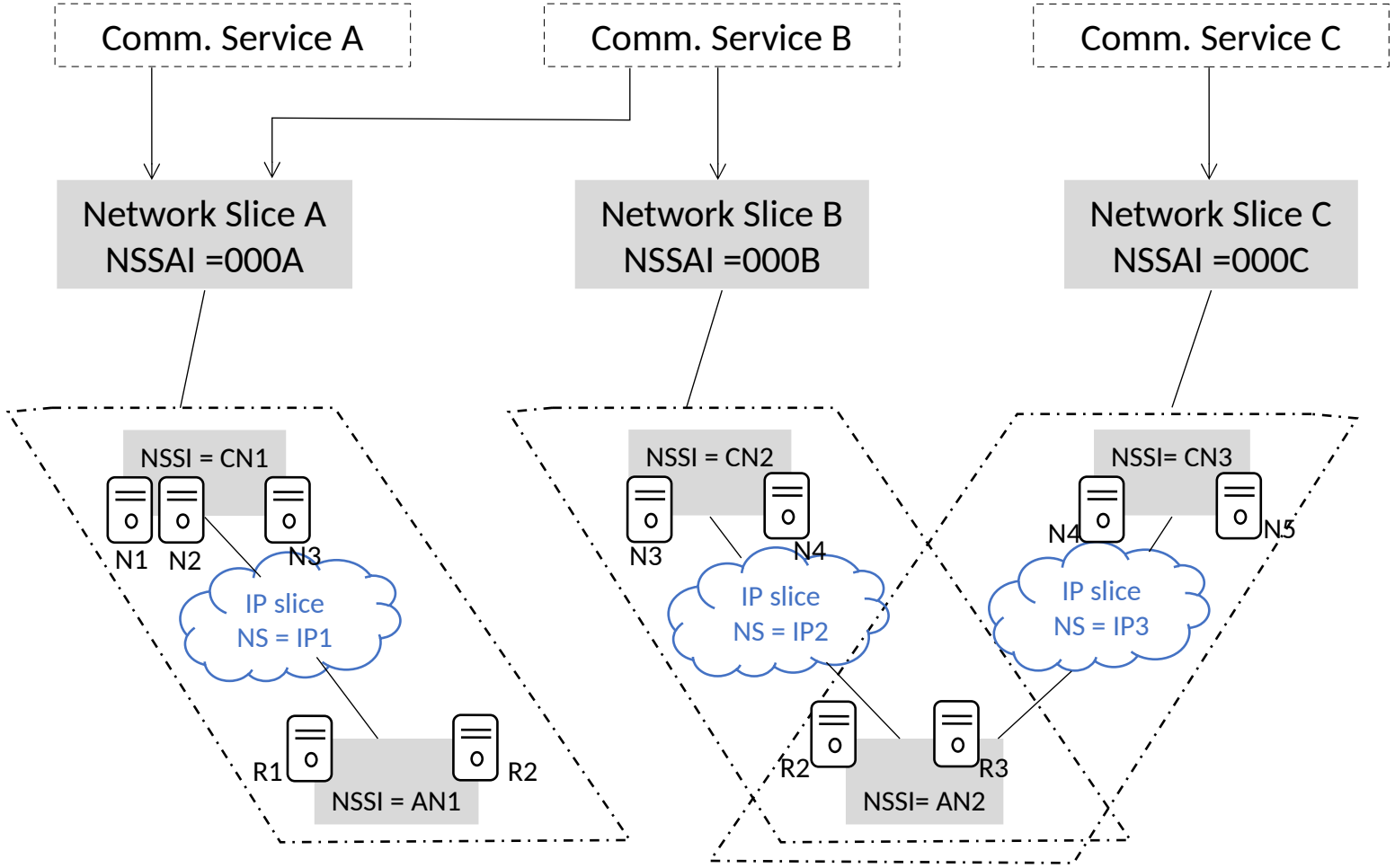
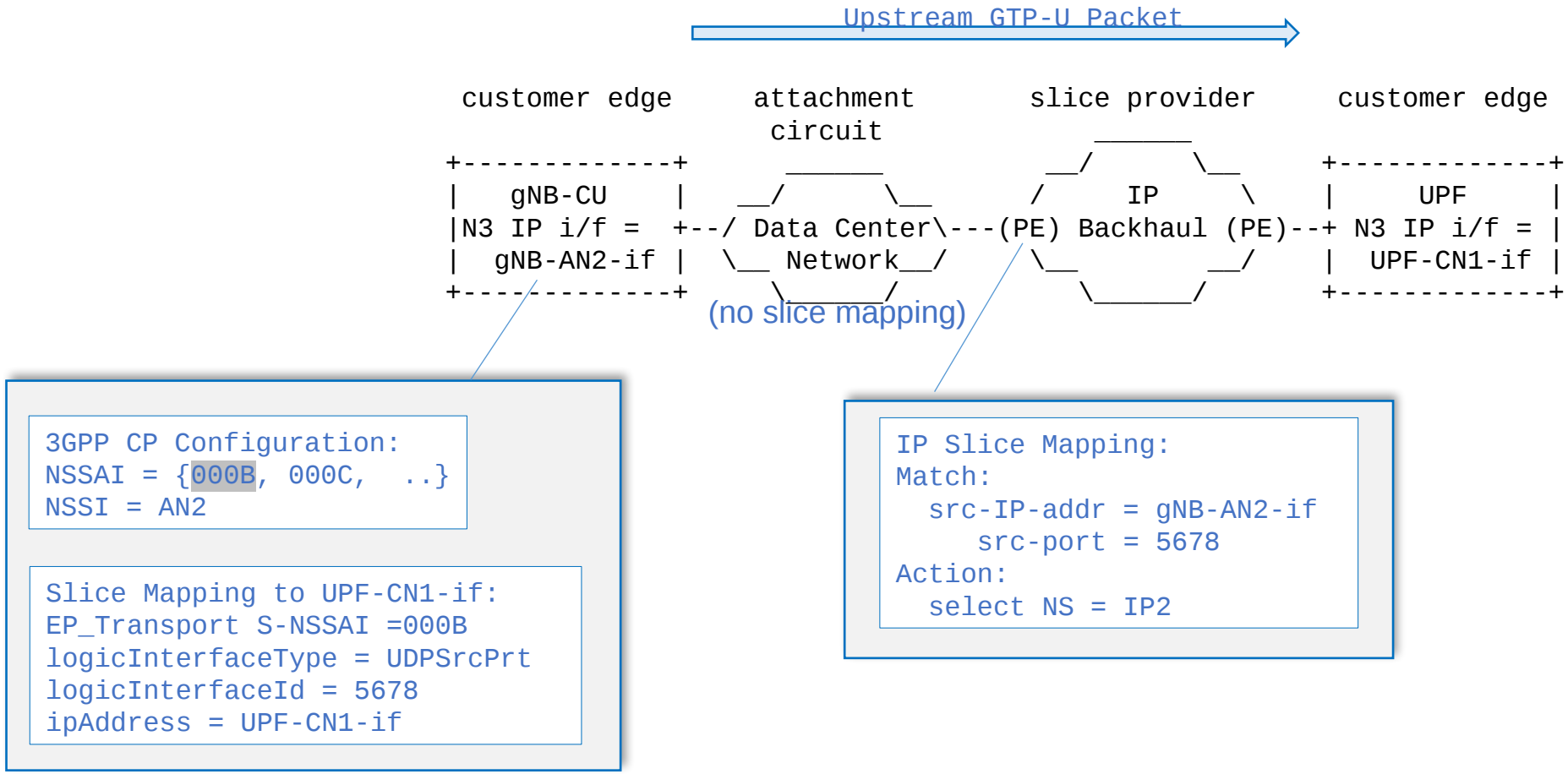


Figure and description in section 3.4 on 3GPP network slice structure and relation to IP network slice (IETF slice)

Slice Mapping using UDP Source Port (section 3.4, Fig 3)



3GPP slice (NSSAI NSSI) mapped to IP network slice instance using source UDP port when separated by an attachment circuit.