SRH Reduction for SRv6 End.M.GTP6.E Behavior

draft-kawakami-dmm-srv6-gtp6e-reduced-00

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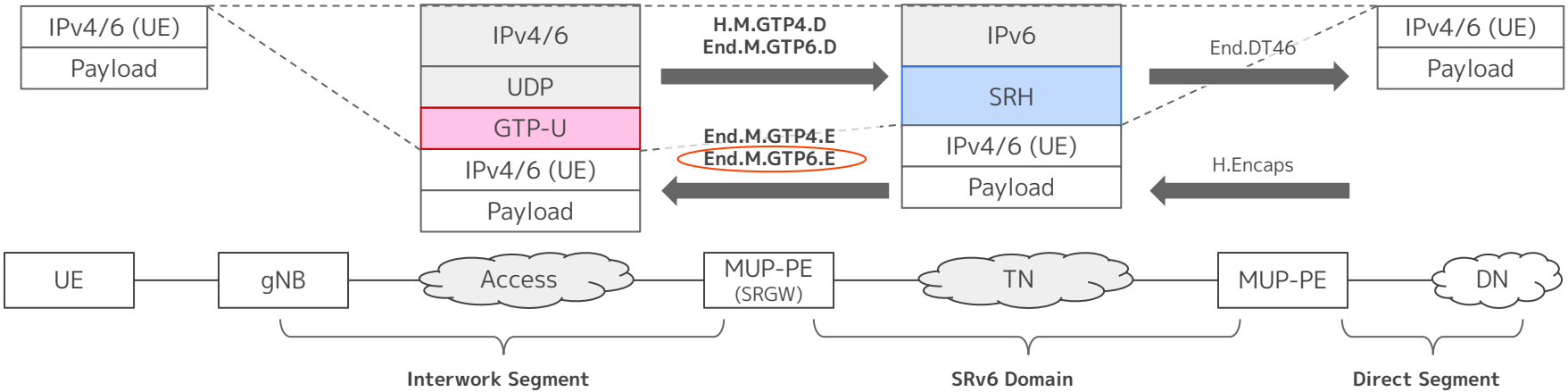
Background: SRv6 Mobile User Plane (SRv6 MUP)

- RFC9433, SRv6 MUP defines interworking between 3GPP 5G User-Plane and SRv6 transport network with required behaviors which translate between GTP-U and SRv6 in a stateless manner
- I-D.mhkk-dmm-srv6mup-architecture defines MUP Architecture w/ control-plane
- I-D.mpmz-bess-mup-safi defines BGP SAFI for the control-plane of MUP Architecture



Reference: End.M.GTP4.E

In the case of End.M.GTP4.E, IPv4 DA(IPv4 address of the gNB) and parameters required for GTP-U (TEID and QFI) are stored in the single SID

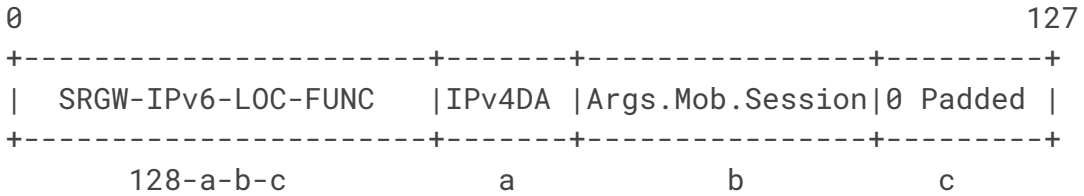
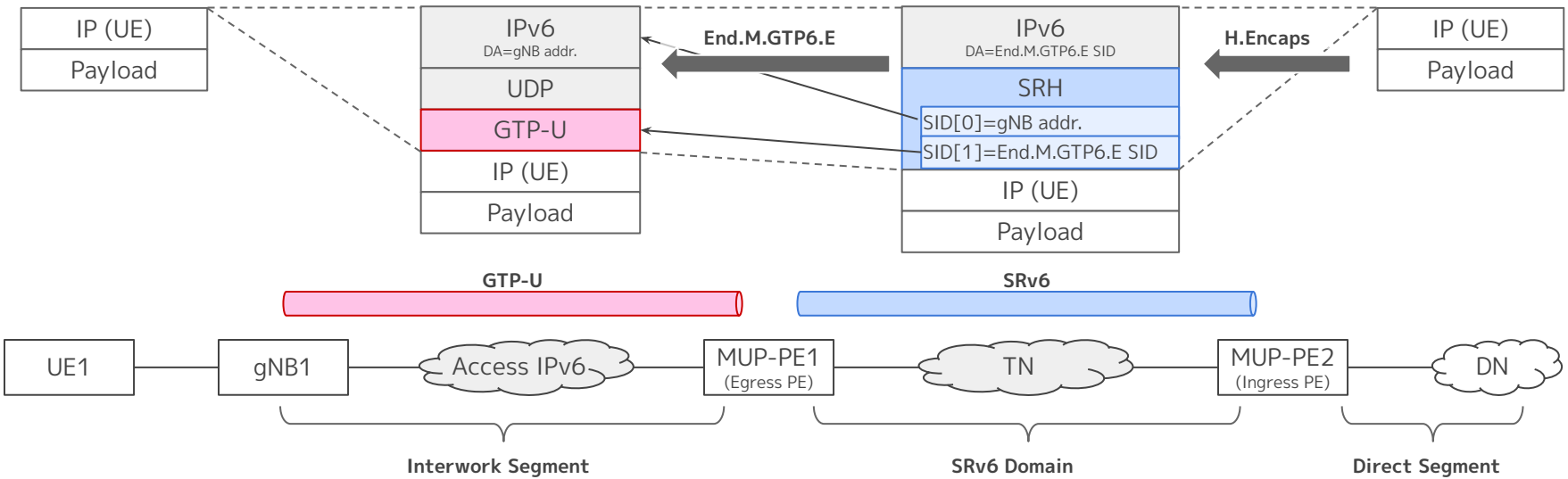


Figure 9: End.M.GTP4.E SID Encoding of RFC9433

Motivation: Make End.M.GTP6.E Hardware-friendly

End.M.GTP6.E Behavior



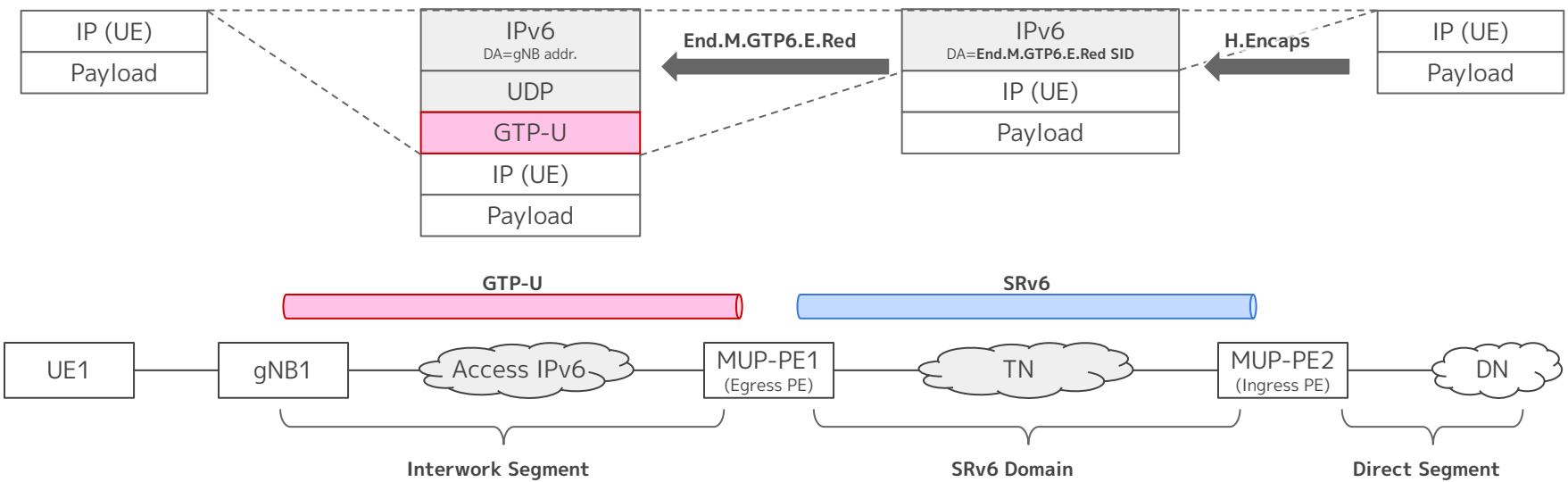
Ingress PE (MUP-PE2) pushes an SRH with 2 SIDs

Egress PE (MUP-PE1) restores the DA of IPv6 header (gNB IPv6 address) from SID[0] and GTP-U header(TEID & QFI) from SID[1]

➡ **current hardware pipelines may be unfamiliar or insufficient to implement this**

End.M.GTP6.E.Red

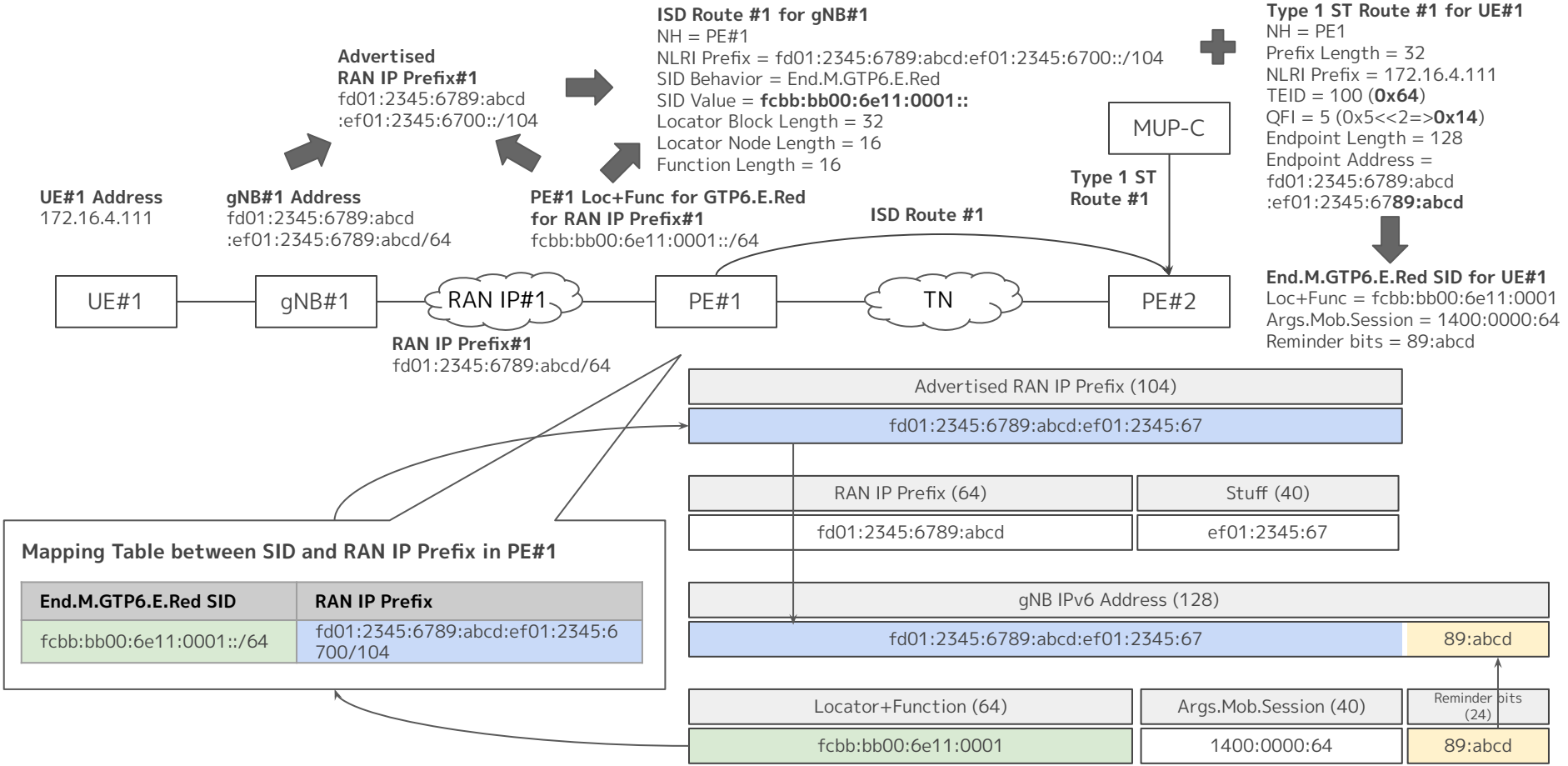
End.M.GTP6.E Behavior with reduced SRH



Ingress PE (MUP-PE2) pushes just an IPv6 header (no SR header if no TE is required)

Egress PE (MUP-PE1) restores the DA of IPv6 header (gNB IPv6 address) and GTP-U header(TEID & QFI) **from the single SID utilizing the control-plane of the MUP Architecture**

End.M.GTP6.E.Red



Mapping Table between SID and RAN IP Prefix in PE#1

End.M.GTP6.E.Red SID	RAN IP Prefix
fcbb:bb00:6e11:0001::/64	fd01:2345:6789:abcd:ef01:2345:6700/104

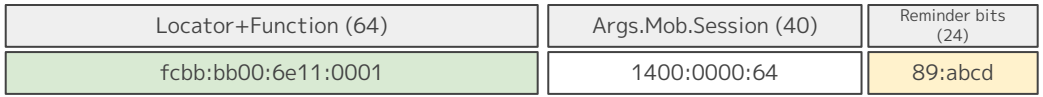
Deployment Design Options

- Pattern #1: Classic SID
  - 32b Loc-Block + 16b Loc-Node + 16b Func. + 40b Args.Mob.Session = 104b
  - The Advertised RAN IP Prefix is /104
- Pattern #2: f3216 uSID
  - 32b Loc-Block + 16b Loc-Node Func. + 40b Args.Mob.Session = 88b
  - The Advertised RAN IP Prefix is /88

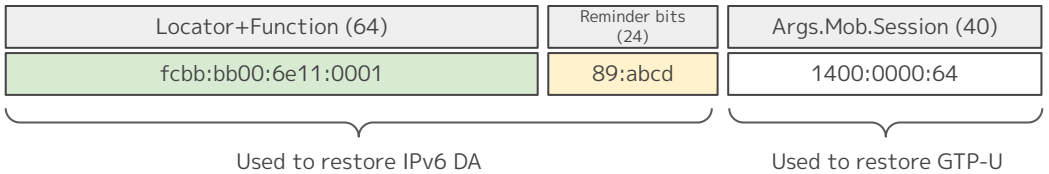
Feedbacks

- The order of bit field in End.M.GTP6.E.Red SID
  - make SID processing more hardware pipeline friendly
  - End.M.GTP4.E has the same order (IPv4 DA then Args.Mob.Session)
  - will be discussed and applied to -01 draft if reasonable

Current design (derives from End.GTP.6.E)



Suggested design



Implementation of VPP(stable/2306-based) is available at
https://github.com/yuyarin/vpp/tree/draft-kawakami-dmm-srv6-gtp6e-reduced-00