SRV6 Data Plane for Mobile Core
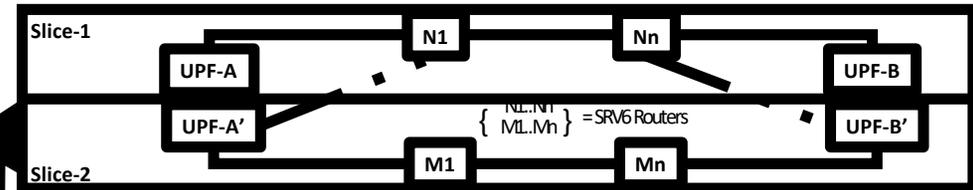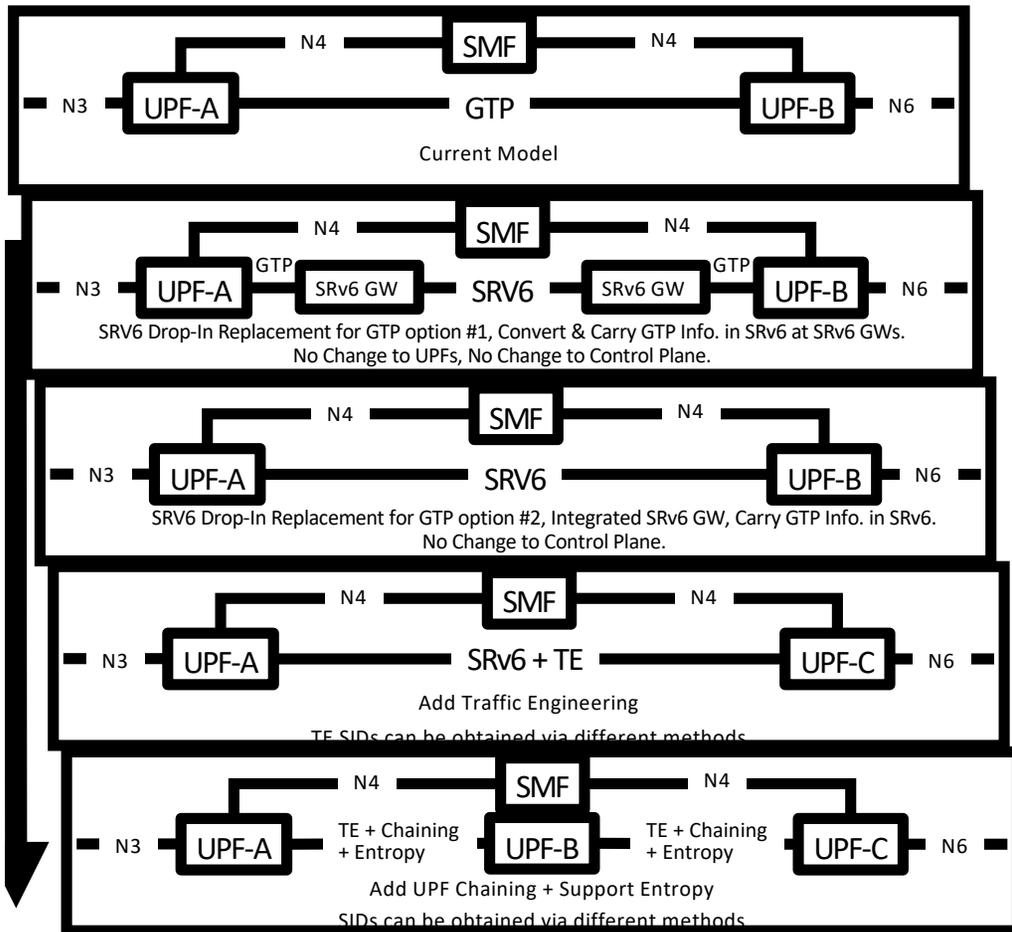
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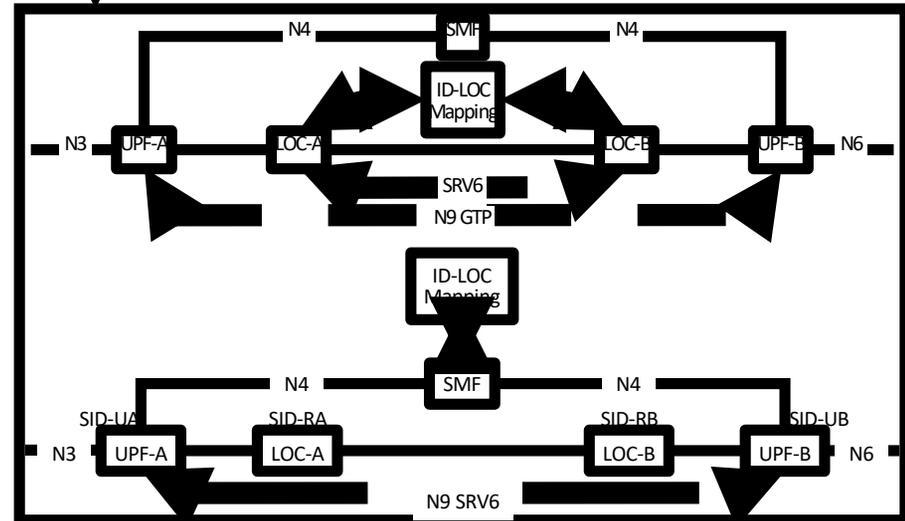
IETF 102, Montreal

July, 2018

SRv6: A Smooth Transition & Pragmatic Approach to Change N9

Current Model
UPF-A — N4 — SMF — N4 — UPF-B
N3 · GTP · N6

SRV6 Drop-In Replacement for GTP option #1, Convert & Carry GTP Info. in SRv6 at SRv6 GWs.
No Change to UPFs, No Change to Control Plane.
UPF-A — GTP — SRv6 GW — SRV6 — SRv6 GW — GTP — UPF-B
N3 · N4 — SMF — N4 · N6

SRV6 Drop-In Replacement for GTP option #2, Integrated SRv6 GW, Carry GTP Info. in SRv6.
No Change to Control Plane.
UPF-A — SRV6 — UPF-B
N3 · N4 — SMF — N4 · N6

Add Traffic Engineering
TE SIDs can be obtained via different methods
UPF-A — SRv6 + TE — UPF-C
N3 · N4 — SMF — N4 · N6

Add UPF Chaining + Support Entropy
SIDs can be obtained via different methods
UPF-A — TE + Chaining + Entropy — UPF-B — TE + Chaining + Entropy — UPF-C
N3 · N4 — SMF — N4 · N6

Toward Advanced Mobility with SRV6

Slice-1: UPF-A — N1 — Nn — UPF-B
UPF-A' — { N1..Nn, M1..Mn } = SRv6 Routers — UPF-B'
Slice-2: M1 — Mn

UPF-A — LOC-A — ID-LOC Mapping — LOC-B — UPF-B
N3 · N4 — SMF — N4 · N6
SRV6 / N9 GTP

ID-LOC Mapping — SMF

SID-UA — SID-RA — SID-RB — SID-UB
UPF-A — LOC-A — N4 — SMF — N4 — LOC-B — UPF-B
N3 · N9 SRV6 · N6

1. Drop in SRV6 to replace GTP-U in data plane without changing the control plane.
2. Gradually introduce SRV6 features as needed.
3. Optionally add advanced mobility support either at global, 5G slice level, or for a particular set of flows

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SRv6 Demo

➢ Huawei 5G Slicing and Anchorless Mobility
- Uses OAI open source to create multiple LTE slices.
- Will initially use SRv6 gateways in data plane to carry GTP information.
- No change to 3GPP control plane N2, N3, N4, or N6.
- We are considering two options for SRv6 GWs:
  - VPP
  - Kernel modification
- Implementation will follow draft-ietf-dmm-mobile-uplane

➢ We are working on a plan to integrate Huawei's OAI and Sprint's MCORD demos to show end to end SRv6 data plane between eNB-SGW and SGW-PGW.
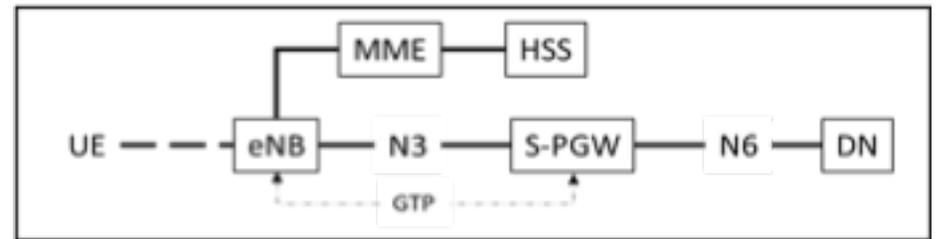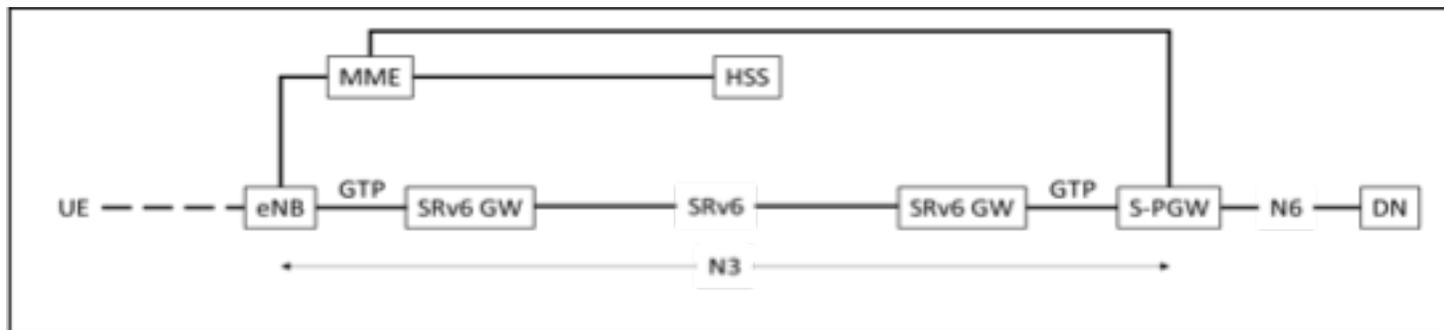
SRv6 Demo

Obstacles:

- OAI implementation combines SGW and PGW into a single module
- There is not really a N9 interface.
- OAI is not planning to provide separate SGW and PGW modules
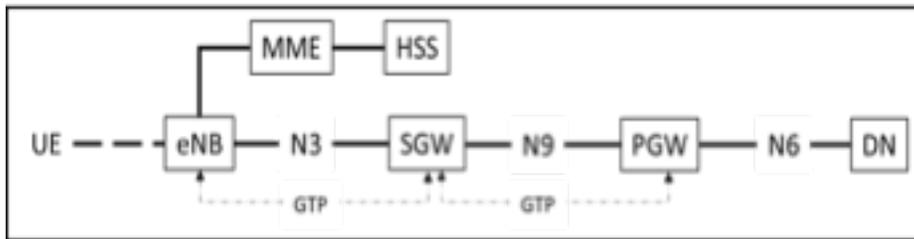
3GPP Model

OAI Implementation

Demo phase One Implementation

SRv6 Demo: Next Phase

- SRv6 integration into eNB and S-PGW