Architecture Discussion on SRv6 Mobile User plane

draft-kohno-dmm-srv6mob-arch-03

17 Nov. 2020 IETF109

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Agenda

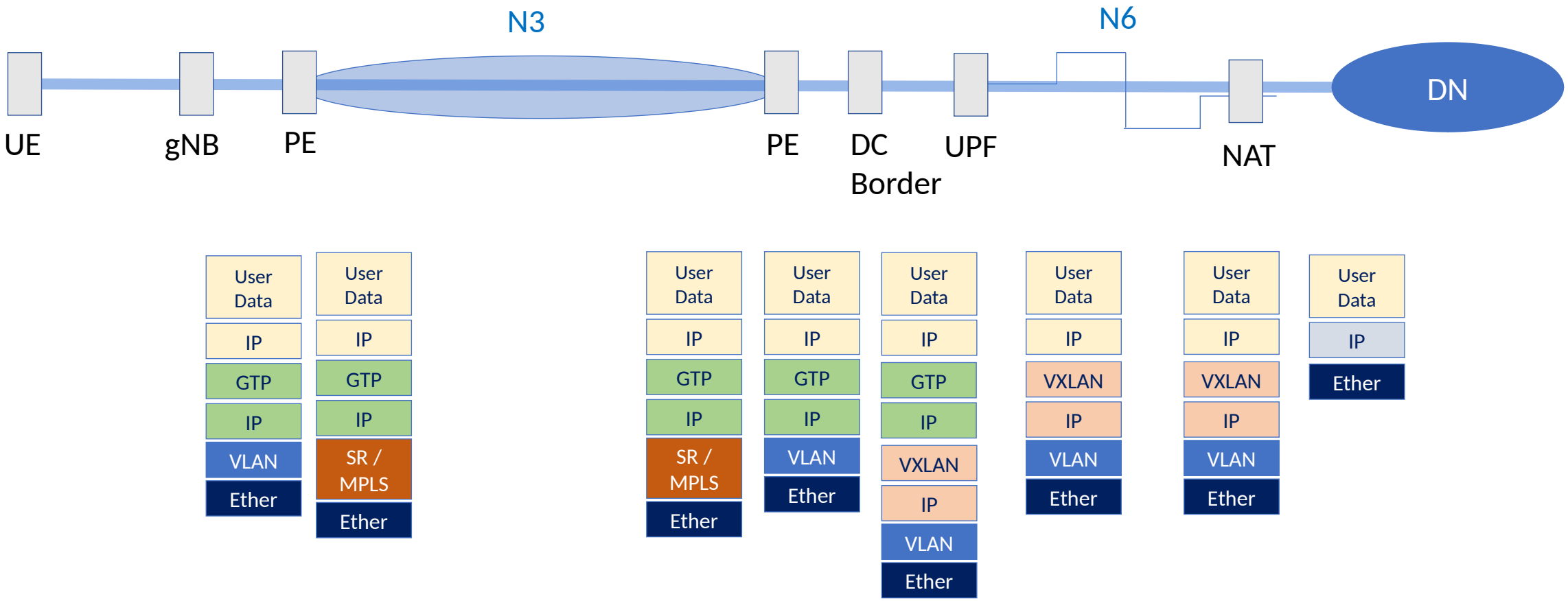
- Objective of this draft (revisited)
- Architecture Discussion
- Exemplification
  - Network Slicing
  - Edge Computing
  - URLLC
- Conclusion and Next step

Revisited the objective of this draft

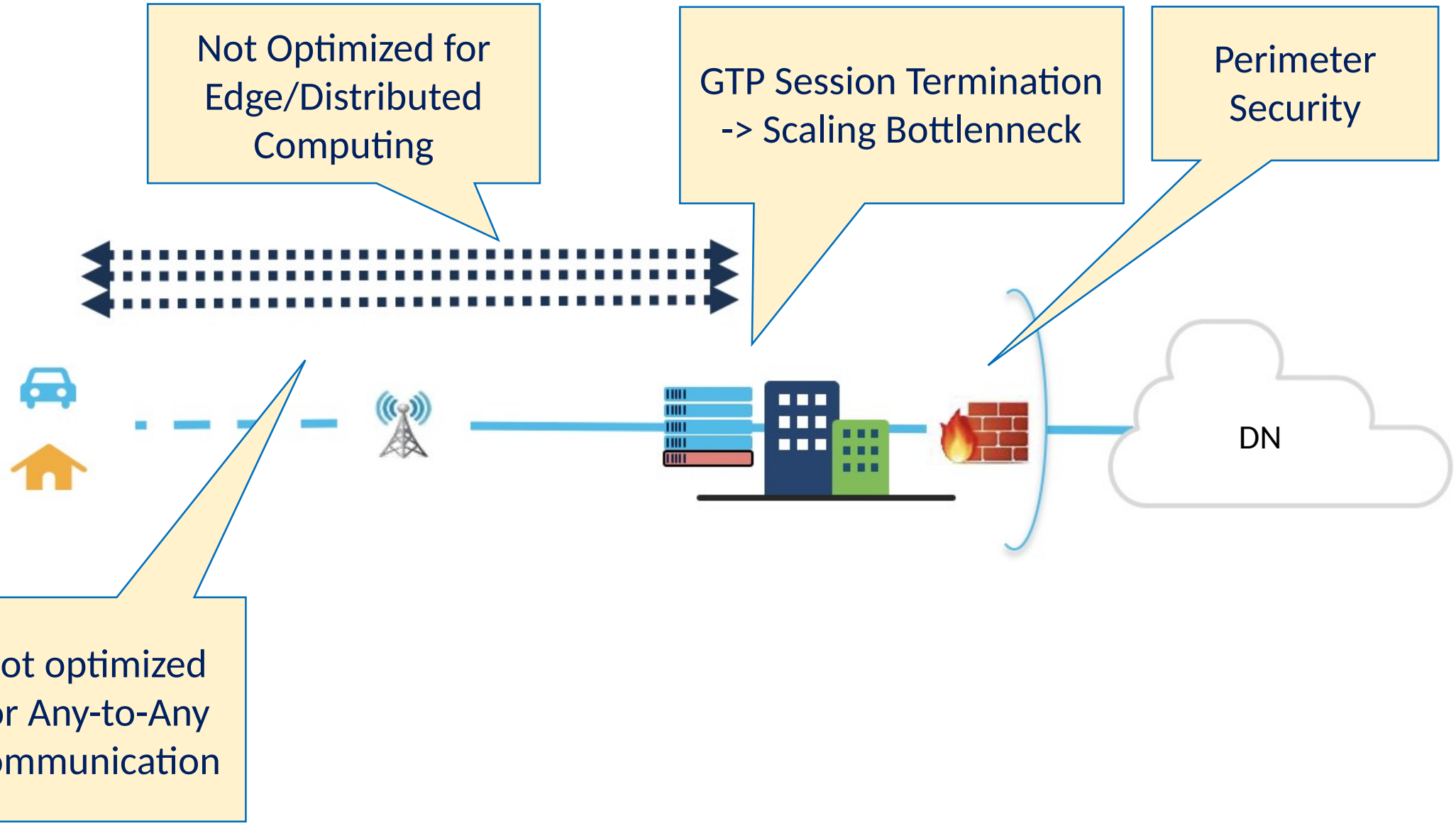
- This document discusses a solution approach and its architectural benefits of common data plane across domains (e.g., mobile including UE, IP transport, data center, applications) and across overlay/underlay.

- This approach is in a sense contrary to proposals that the underlying transport can be anything.
- But it is an approach to make the network as flat as possible, making it suitable for the distributed mobile deployment model.

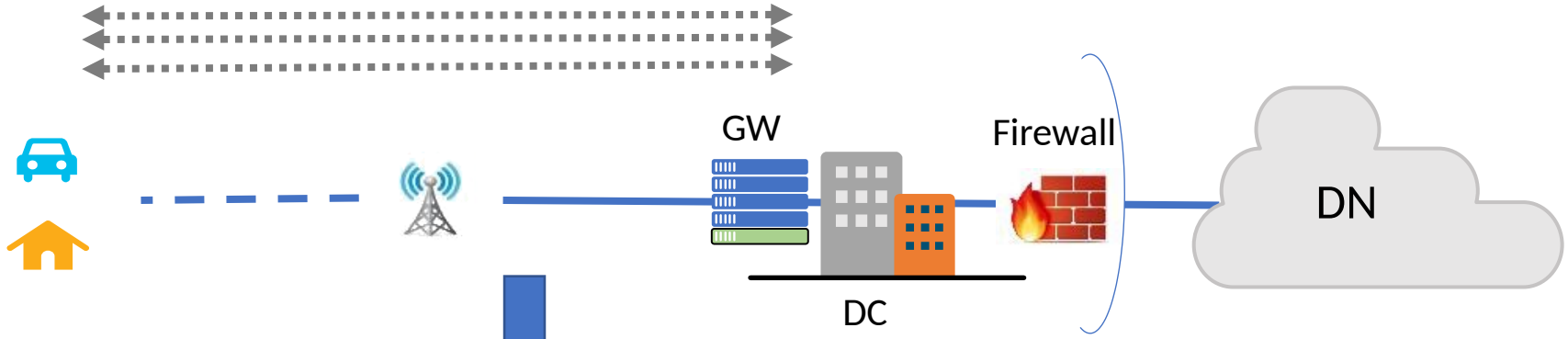
Existing Mobile Network



The limitation of the existing mobile network



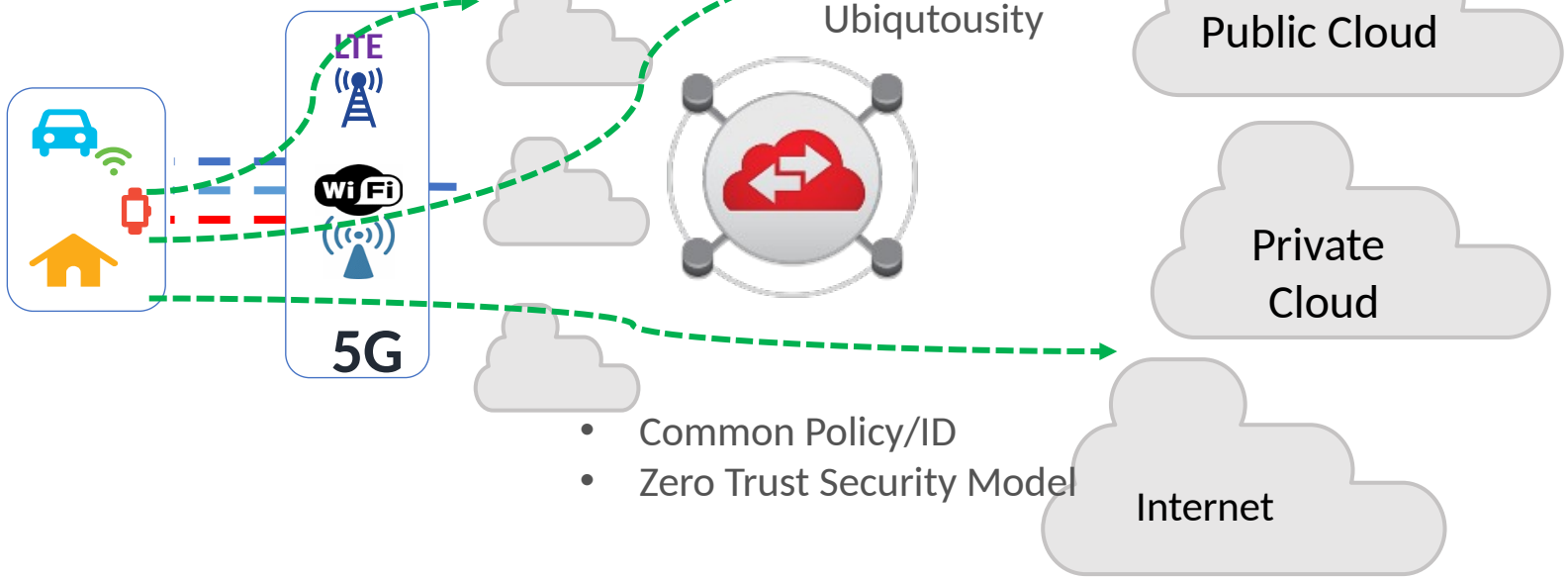
Toward Distributed Mobile Network



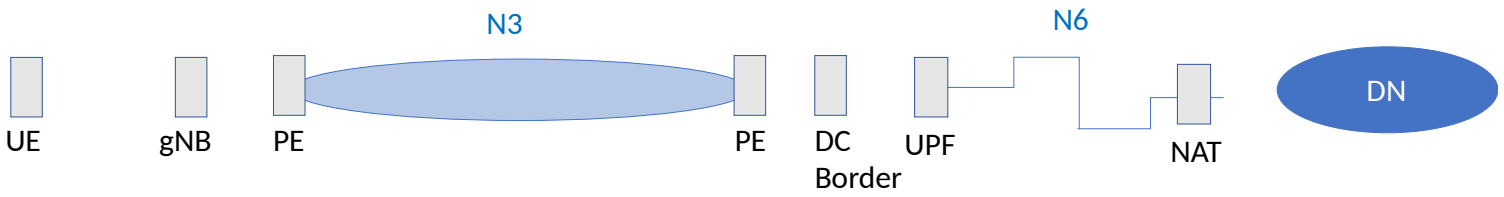
As is

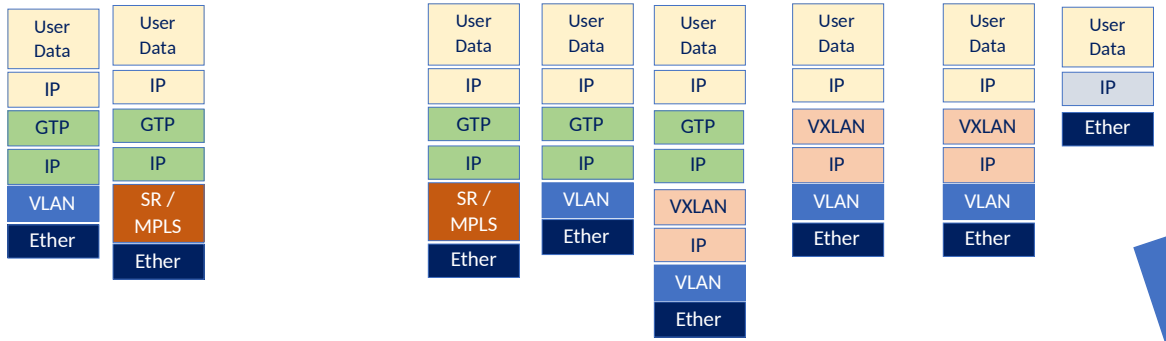
To be

- Edge/Distributed Cloud
- Hetero Access
- Multi Cloud
- Data Ubiqutousity
- Common Policy/ID
- Zero Trust Security Model

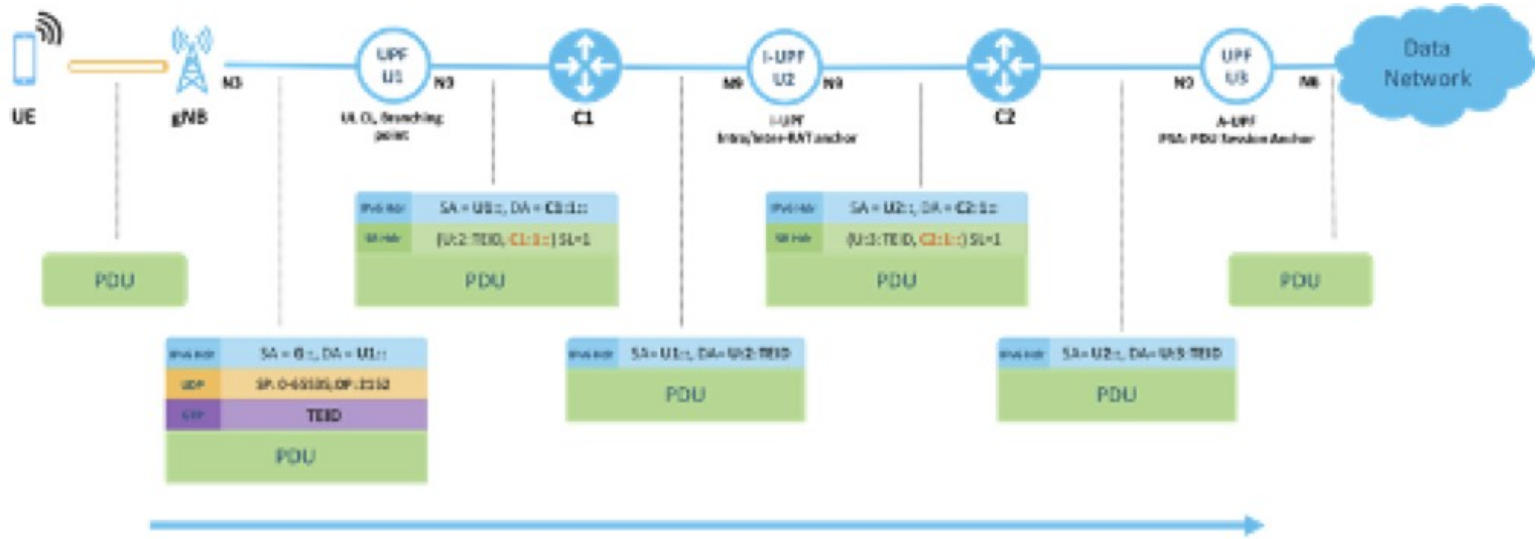


SRv6 Mobile User Plane





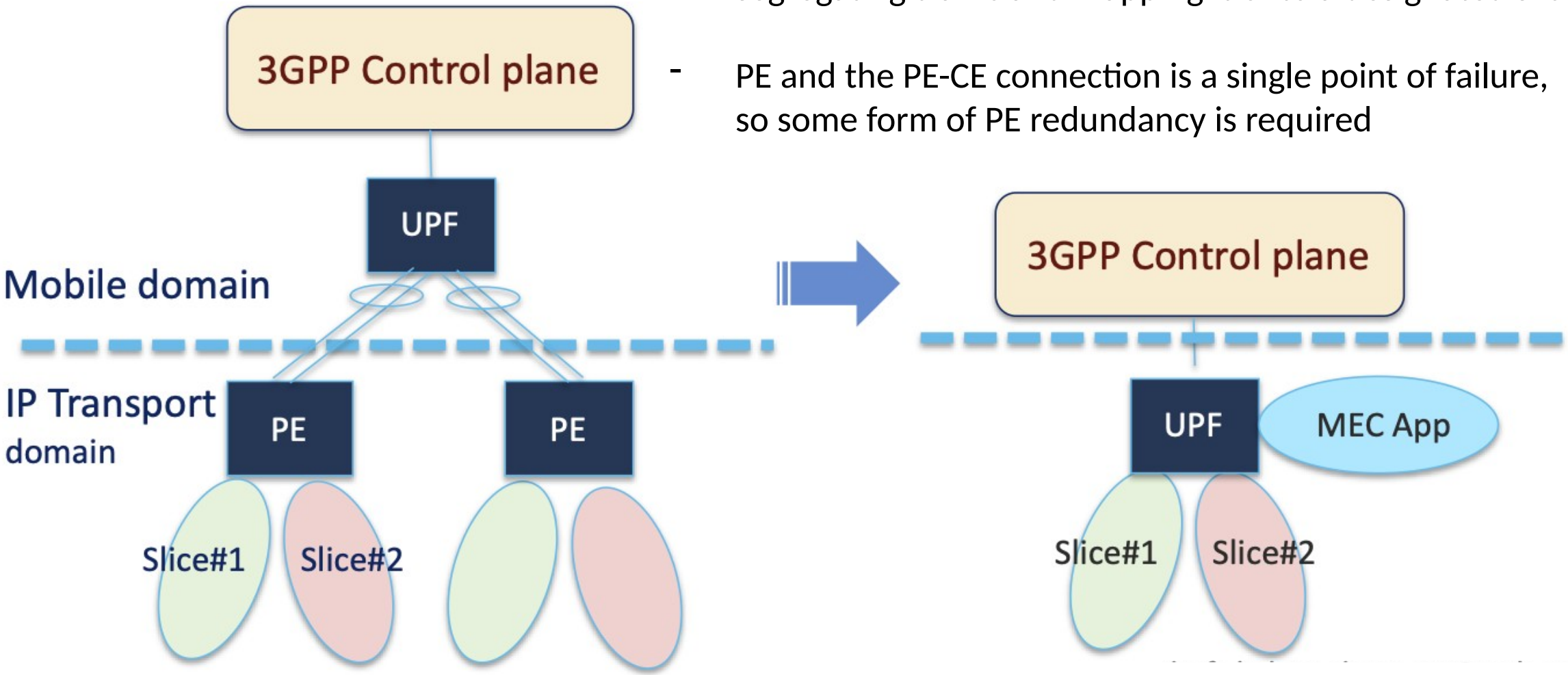
- Simple
- Flat
- Common Data Plane
  - Across domains
  - Overlay/Underlay



Network Slicing

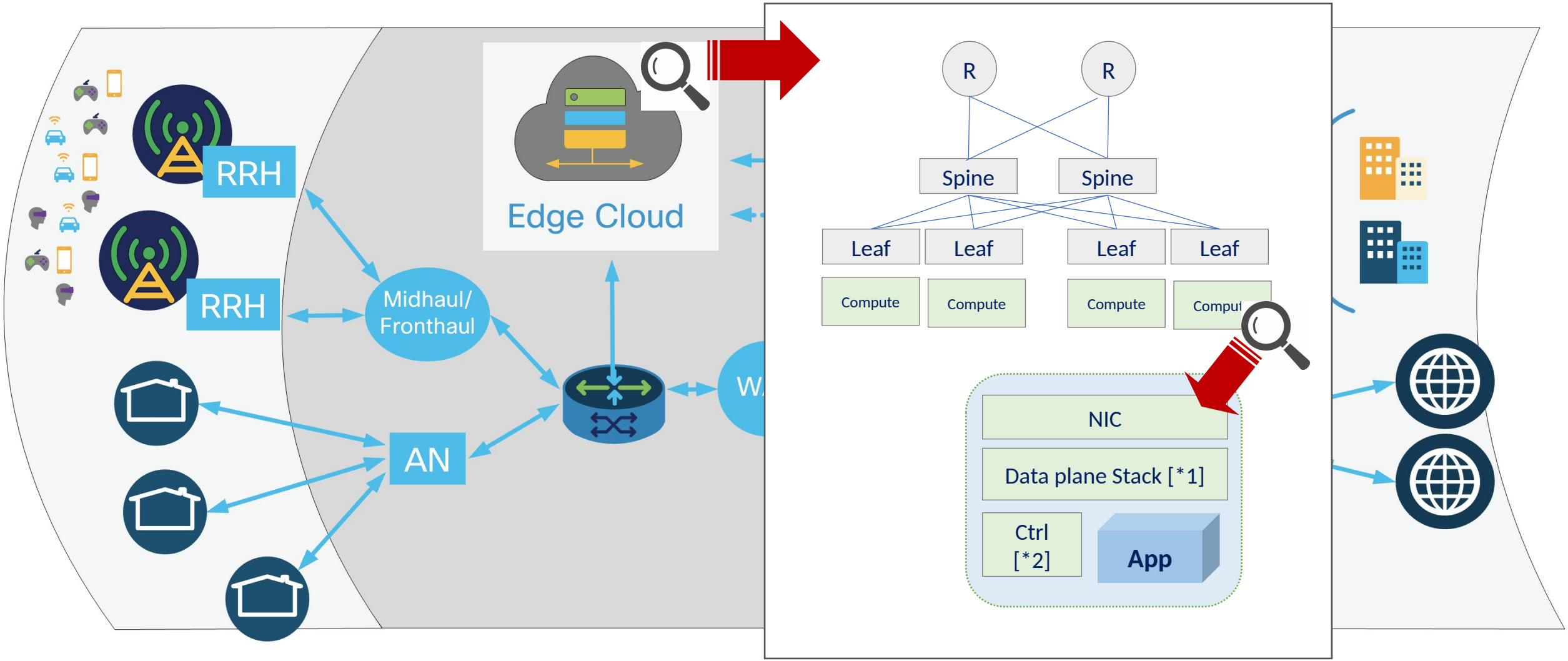
Current issue

- A certain extra ID such as VLAN-ID is needed for segregating traffic and mapping it onto a designated slice
- PE and the PE-CE connection is a single point of failure, so some form of PE redundancy is required



Edge Computing

Edge/Distributed computing needs an application framework



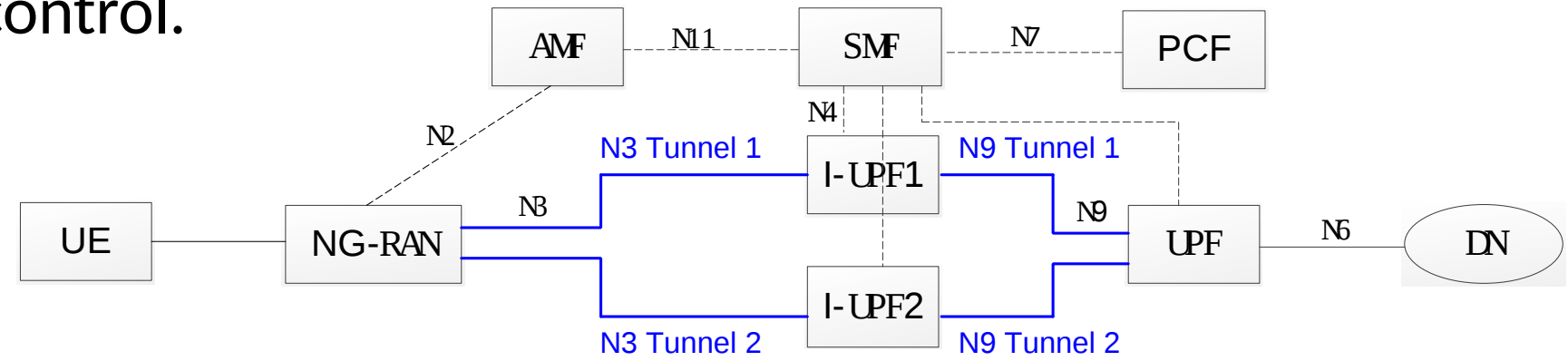
[*1] Data plane stack : VPP, OVS, Linux Kernel (xDP), etc. [*2] Control plane or Agent for Controller, etc.

URLLC

- 3GPP [TR.23725] Section 6.4 addresses the issues on how to support redundant data transmission via single UPF and single RAN node

  - But overlay tunnel cannot ensure the disjoint path
  - The replication/merging point would be the single point of failure

- SRv6 is simpler to support tight-SLA/URLLC
- Furthermore, SRv6 supports inband telemetry/time stamping for latency monitoring and control.



Reference: 3GPP TR 23.725 Figure 6.4.1-2 Two N3 and N9 tunnels between NG-RAN and UPF for redundant transmission

Conclusion and Next step

- This document discusses a solution approach with SRv6 and its architectural benefits of common data plane across domains and across overlay/underlay
- This approach makes the network as flat as possible, and enables distributed mobile deployment, which has advantages for major 5G requirements - Network Slicing, Edge Computing and URLLC

- DMM WG adoption ?