Control-/Data Plane for N6 Traffic Steering
(https://www.ietf.org/id/draft-fattore-dmm-n6-trafficsteering-00.txt)

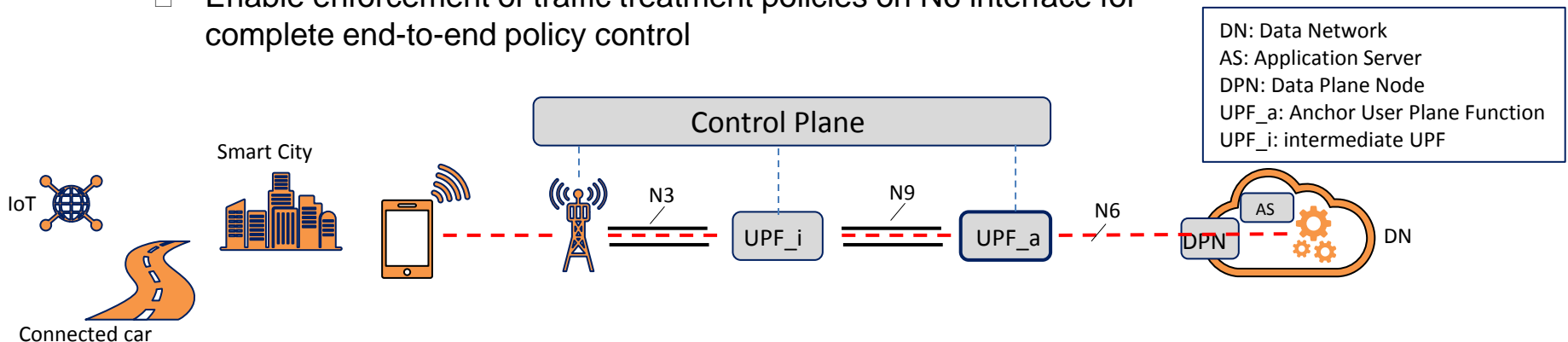Umberto Fattore, Marco Liebsch (NEC)
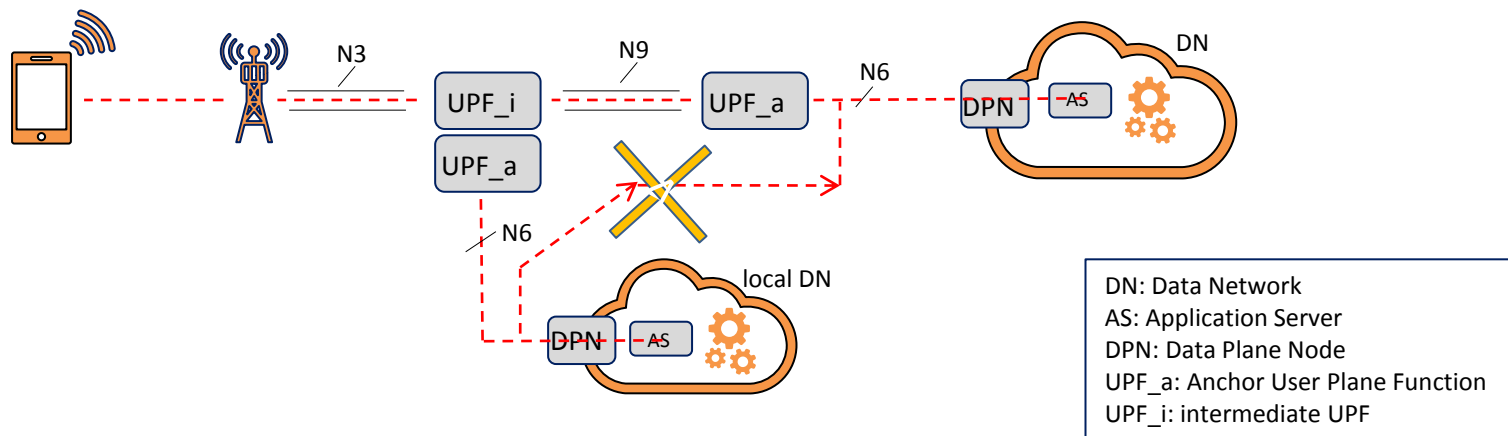
IETF#103

November 8th, 2018

Bangkok

Background & Motivation

- Various drafts published in the context of data plane protocol solutions for the 3GPP mobile architecture's N9 interface
    - Context: 3GPP CT4 LS – Data Plane Study
    - Candidates: Tunneling protocols, ID-LOC separation, Locator re-write, ..

- Routing of IP PDUs assumed on N6 interface

- Future support of industry verticals:
  Demand for more flexible deployment options ($\rightarrow$ customization) and traffic steering
    - Mobile device applications connect to multiple distributed data networks (central, edge)

- This draft:
    - Enable de-coupling of anchoring UPF(s) from data network(s) and UPF distribution
    - Enable enforcement of traffic treatment policies on N6 interface for complete end-to-end policy control
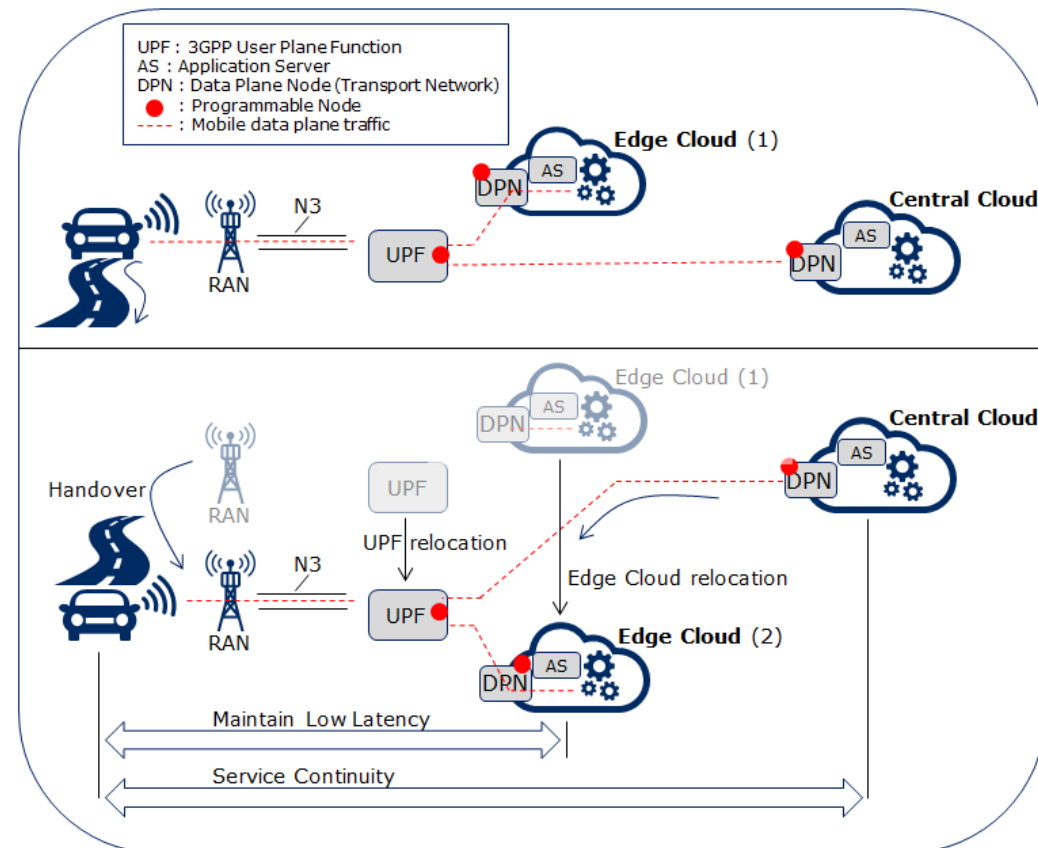
DN: Data Network
AS: Application Server
DPN: Data Plane Node
UPF_a: Anchor User Plane Function
UPF_i: intermediate UPF

IoT

Smart City

Connected car

Control Plane

N3

N9

N6

UPF_i

UPF_a

DPN

AS

DN

Use Cases and Problem Statement (1/2)

- ☐ Mobile applications associated with services in multiple data neworks

- ☐ Mobile control plane selects and configures main anchor UPF and complementary anchor UPF(s) to access multiple distributed data networks
  - ☐ UL/DL traffic treatment on UPFs configured by control plane
  - ☐ DL traffic from data network(s) to UPF(s) may be ambiguous (not aligned with mobile core)

- ☐ Control routing of DL traffic from data networks to the most suitable anchor UPF

- ☐ Need to enforce traffic treatment rules on data network side

DN: Data Network
AS: Application Server
DPN: Data Plane Node
UPF_a: Anchor User Plane Function
UPF_i: intermediate UPF

Use Cases and Problem Statement (2/2)

☐ Edge deployment of anchor UPF, e.g. to enable low-latency service access

☐ Re-configuration of the data plane to maintain required service level

☐ Re-selection and configuration of new anchor UPF
(also refer to MFA draft https://www.ietf.org/id/draft-gundavelli-dmm-mfa-01.txt)

☐ Update data plane on N6 to steer traffic to new UPF

    ☐ Use of SRv6, tunnel, ID-LOC, ..

Scope of this draft

- Use cases and **operation** of de-centralized mobile data plane
  - Flexible deployment and re-configuration of anchor UPF(s)

- **Semantics** and **data models** for DPN traffic treatment policies (UL, DL) on N6
  - Enforcement at data network(s) (DPN/AS) for DL traffic and at anchor UPF for UL traffic
  - Use of SRv6, ID-LOC, LOC re-write, .. policies for traffic steering

- **Architecture** to bind end-to-end data plane control to Mobile Control Plane and required semantics to/from 3GPP control plane
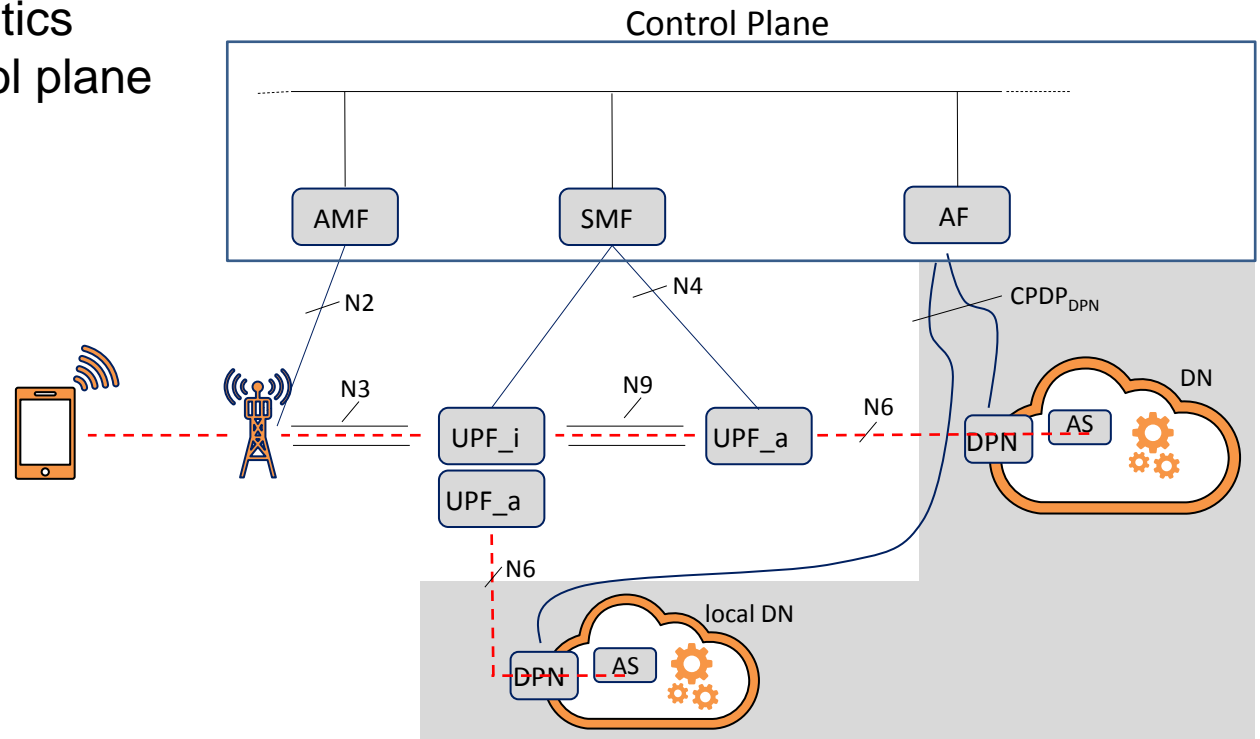
Summary of feedback received so far..

Thanks to John, Sri and Shunsuke!

- „Valuable work since N6 aspects are underspecified in 3GPP"

- „Clarify in the draft that focus is on N6 to meet QoS and traffic steering requirements"

- „Complement 3GPP core; propose few extensions to 3GPP if required"

- „Include asymmetric route use case and problem statement in draft" (slide #3)

- „Be specific to N6 protocol for traffic steering (e.g. Tunnel) or generic?"

- „Consider compatibility with load balancers within data networks"

- „Consider co-located UPF_i and UPF_a to enable Edge Computing" (in-line with slide #3)

Next

☐ Useful work?

☐ Draft update will cover feedback and move towards a real specification document per the defined scope

☐ More input appreciated!