Mobile Traffic Steering

Room for more standardization… ?

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…in discussion with others

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Background

- DMM was/is about distribution of mobility control- and data plane functions

- End-to-end system comprises..
    - ..Mobility Management System with control plane, Mobility Anchors (MA), radio access, mobile devices, ..
    - ..remaining segments up to Data Network (DN) and Application Servers (AS)

- Today's reality: Distribution and mid-session relocation of a mobile device's MA

- Objective: Session/service continuity after MA relocation
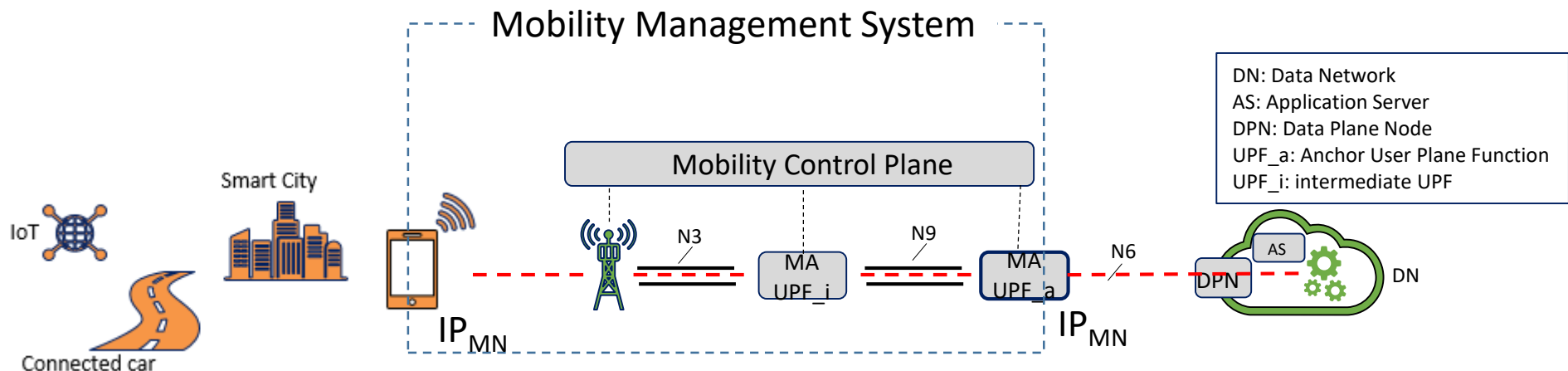
Target scenario

- IP address continuity by de-coupling of a mobile node's IP address from a topologically matching MA
- Traffic steering of non-routable IP
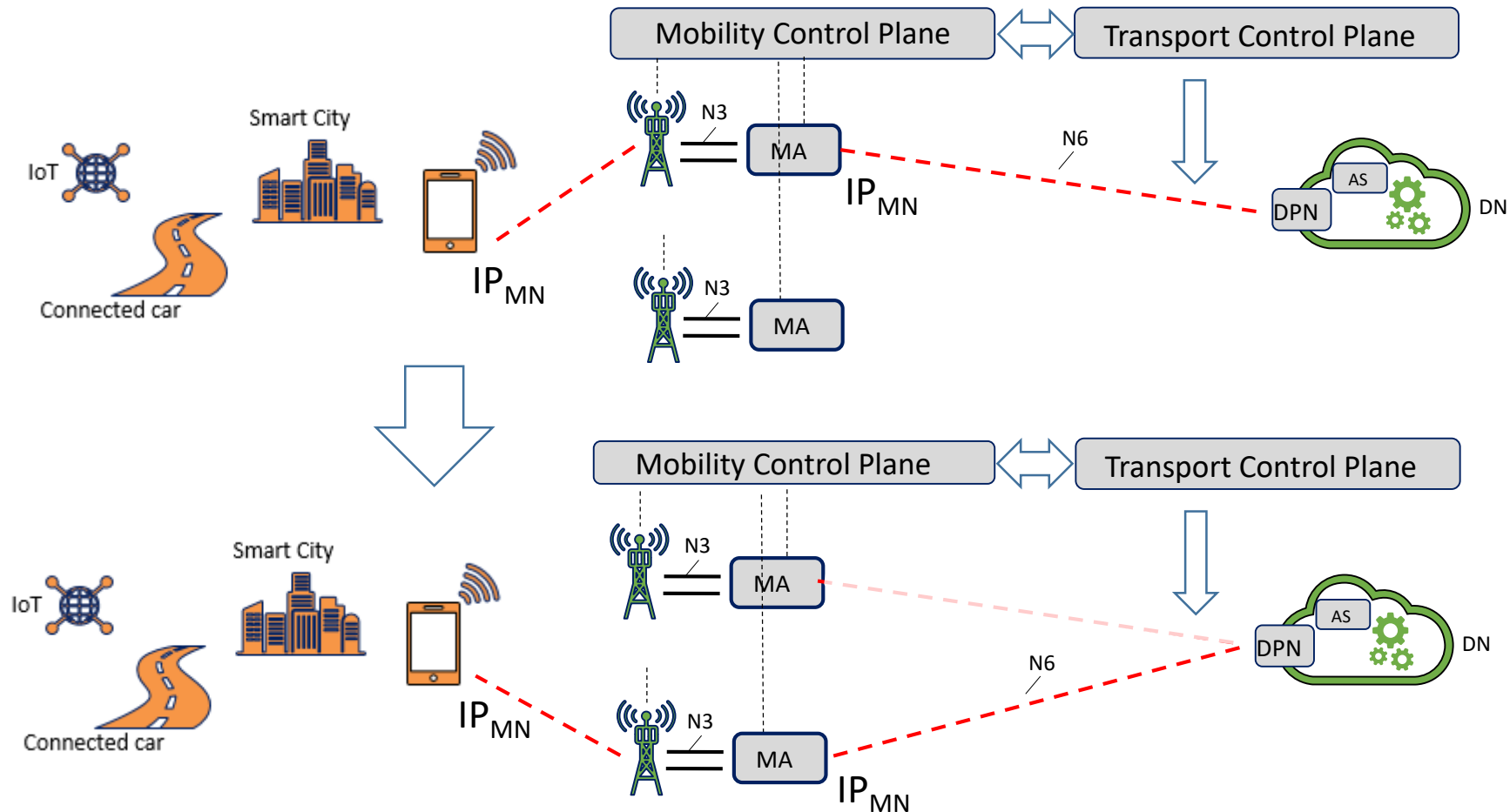
Past work, some examples –
Per-Host Locators for Distributed Mobility Management (2012)

Per-Host Locators for DMM
draft-liebsch-mext-dmm-nat-phl-01

- Utilizes ID-LOC split and locator re-write between ingress- and egress routers

- Applies to network between Mobility Anchor and Data Network

```
                                      +--+
                                      |CN|
                                      +--+
                                       :
                                       :data, dest. address A:1::1
                                       :
                                       V
                                      +--+---+
                                      |IR|NAT|-------------+
                                      +--+---+             |data, dest. address B:1::1
                                                           |
                                                           |
                                                           |
                                                           V
                                                        +----+
             MN's BCE@pMA:                              |NAT |    MN's BCE@nMA:
             HNP A:1::  +----+                          ++----++  HNP_id  A:1::
                        |pMA |                          |nMA/ER|  HNP_loc B:1::
                        +----+                          ++----++
                        |pAR/|                          |nAR/|
                        |pMAG|                          |nMAG|
                        +----+                         /+----+
                          .                           /
                          .    +--+ /
                           .   |MN|/
                              +--+
                             A:1::1

    Figure    Using per-host locators to enable reverse NAT on the MN's
                              current mobility anchor (nMA)
```
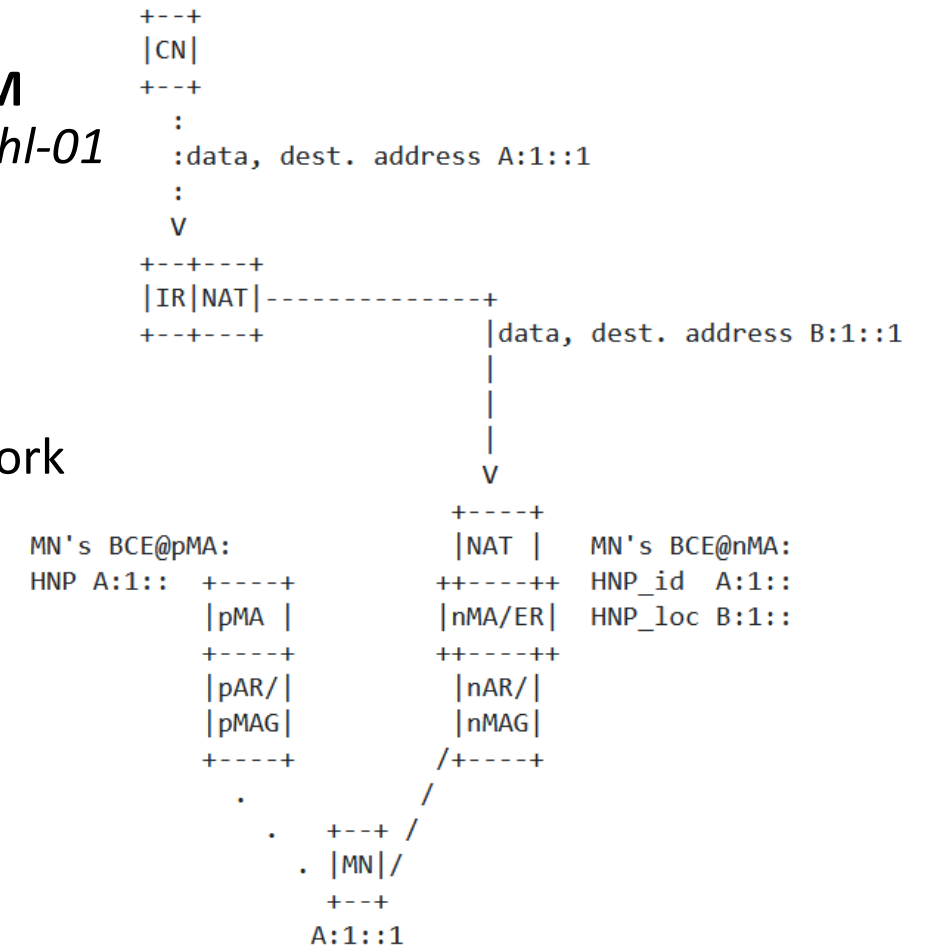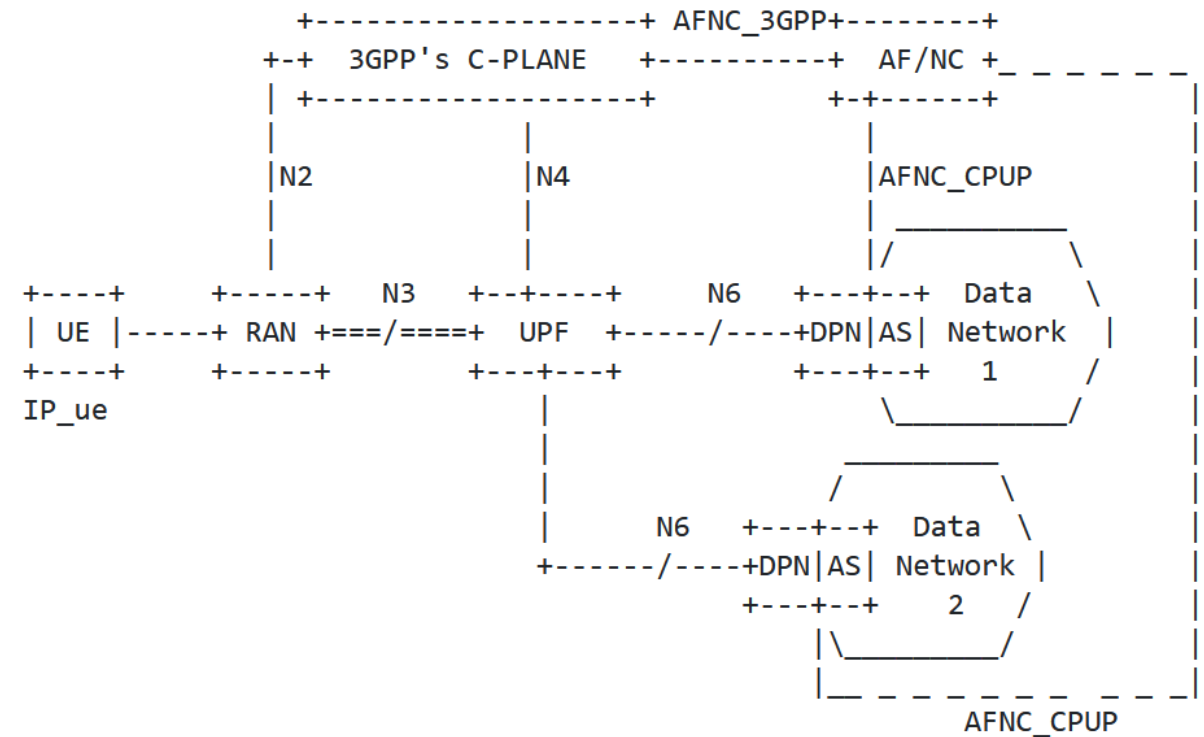
Past work, some examples –
N6 traffic steering (2019)

Control-/data plane aspects of N6 traffic steering
draft-fattore-dmm-n6-cpdp-trafficsteering-01.txt

- Transport / DN control Plane interface with mobility control plane

- Data plane enforces rules for traffic steering between Data Network and Mobility Anchor

```
                              +------------------+ AFNC_3GPP+--------+
                          +-+   3GPP's C-PLANE    +----------+  AF/NC +_ _ _ _ _ _
                          |   +------------------+            +-+------+          |
                          |                  |                  |                 |
                          |N2                |N4                |AFNC_CPUP         |
                          |                  |                  |                 |
                          |                  |                  | _____       |
                          |                  |                  |/         \      |
 +----+      +-----+  N3  +--+----+    N6    +---+--+  Data     \    |
 | UE |-----+ RAN +===/====+  UPF  +-----/----+DPN|AS| Network   |    |
 +----+      +-----+       +---+---+          +---+--+    1     / |
 IP_ue                         |                     _____/      |
                               |                                      |
                               |                      _____       |
                               |                     /         \      |
                               |     N6   +---+--+  Data     \    |
                               +------/----+DPN|AS| Network   |    |
                                          +---+--+    2     / |
                                          |_____/      |
                                          |_ _ _ _ _ _ _ _ _ _|
                                              AFNC_CPUP
```

Past work, some examples –
Mobility-aware Floating Anchor (2019)

Mobility-aware Floating Anchor
draft-gundavelli-dmm-mfa-01

- MFA node controller inserts traffic steering rules into MFA Transit Routers

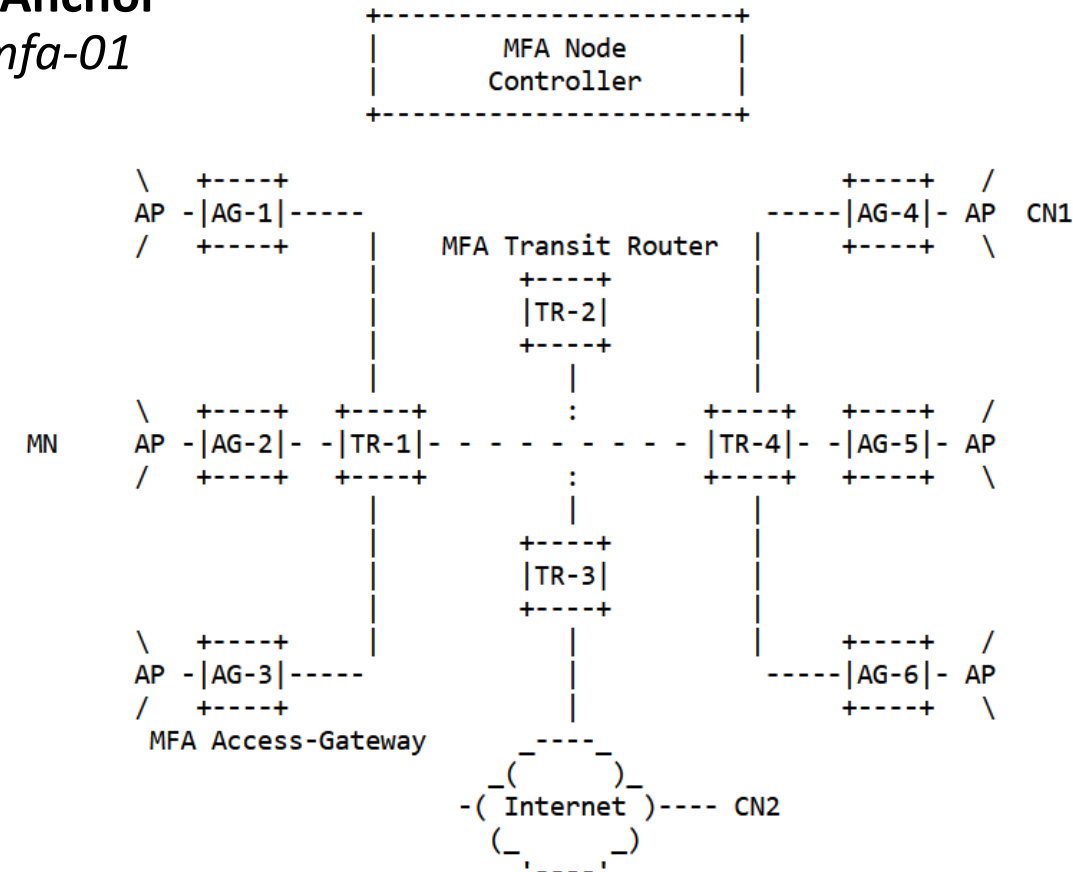- Traffic steering between Transit Routers (TR)

```
                                              +----------------------+
                                              |       MFA Node       |
                                              |     Controller       |
                                              +----------------------+

         \  +----+                                       +----+   /
      AP -|AG-1|-----                             -----|AG-4|- AP  CN1
         /  +----+           |   MFA Transit Router |   +----+   \
                             |        +----+        |
                             |        |TR-2|        |
                             |        +----+        |
                             |           |          |
         \  +----+  +----+   :           |   +----+  +----+   /
 MN    AP -|AG-2|- -|TR-1|- - - - - - - -|TR-4|- -|AG-5|- AP
         /  +----+  +----+   :           |   +----+  +----+   \
                      |           |          |
                      |        +----+        |
                      |        |TR-3|        |
                      |        +----+        |
         \  +----+    |           |          |   +----+   /
      AP -|AG-3|-----            |           -----|AG-6|- AP
         /  +----+              |                +----+   \
         MFA Access-Gateway     _----_
                            _(      )_
                          -( Internet )---- CN2
                            (_      _)
                              '----'

           Figure     Reference Topology
```

Discussion

- Interest in such work ?

- Value and relevance of such work ?

- Technical scope of the work ?
  - Semantics and information model to/from Transport Control Plane ①
  - Transport Control Plane ② and Control-/Data Plane interface semantics ③
  - Forwarding Plane ④

- Intended status and type ?
  - Informational, BCP, ..
  - Analysis, ..