



MONTE: Tackling the biggies

S2-151597

SA2#109, Fukuoka, JP

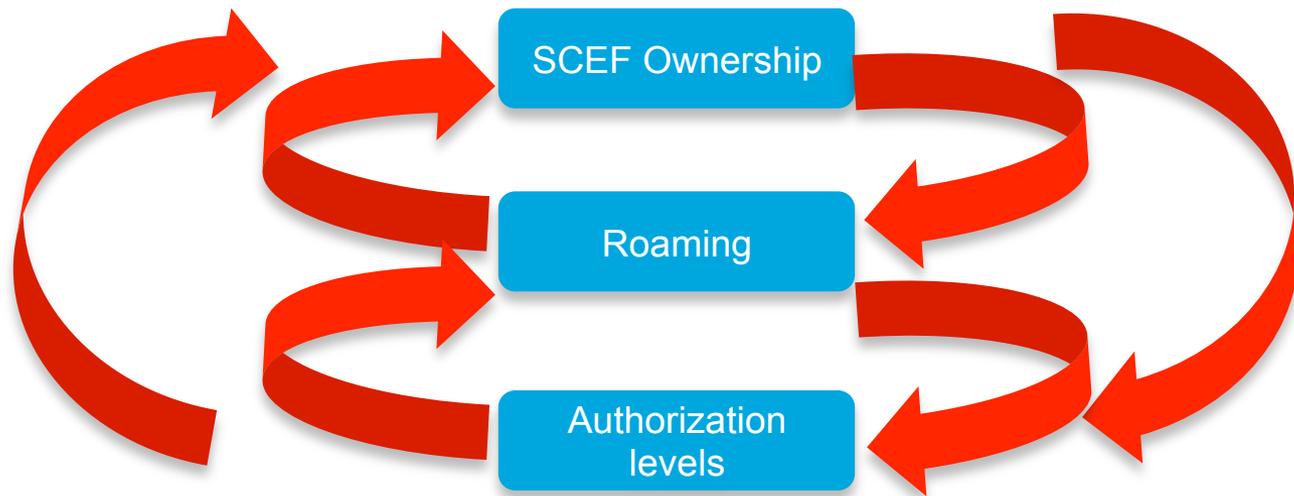
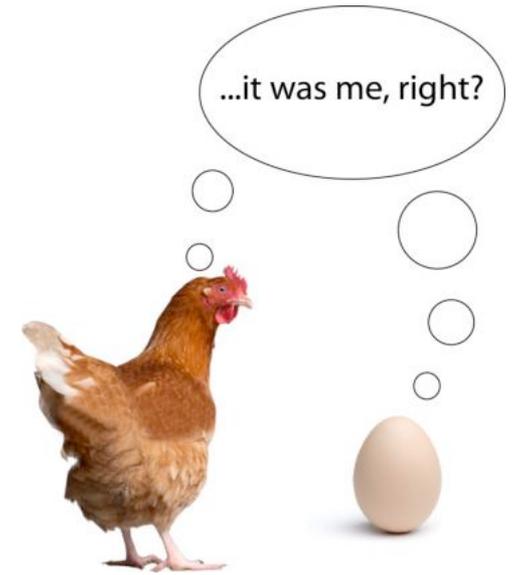
Cisco

V1.0

May 23rd 2015

AGENDA

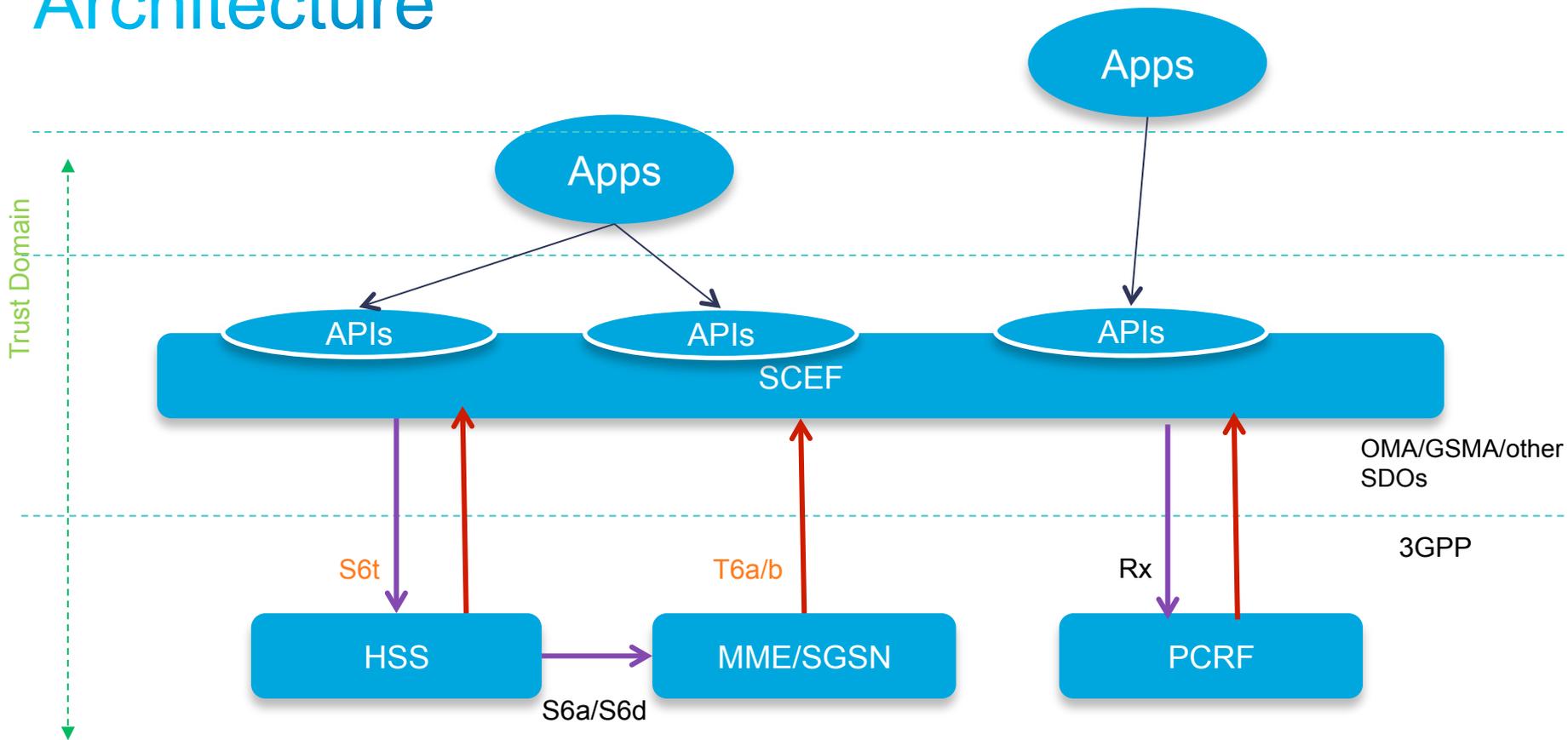
- SCEF ownership
- Roaming
- Various levels of Authorization levels



SCEF Ownership*

*: Only Major ownership scenarios depicted

Agreed AESE + MONTE High level Architecture



-  Event configuration
-  Event reporting

TS 23.682 clause 4.2

The trust domain (see figure 4.2-2) cover entities that are protected by adequate network domain security. The entities and interfaces within the trust domain may all be within one operator's control, or some may be controlled by a trusted business partner which has a trust relationship with the operator e.g. another operator or a 3rd party. The security requirements for the trust domain are out of scope of this document and are assumed to be within SA WG3 scope.

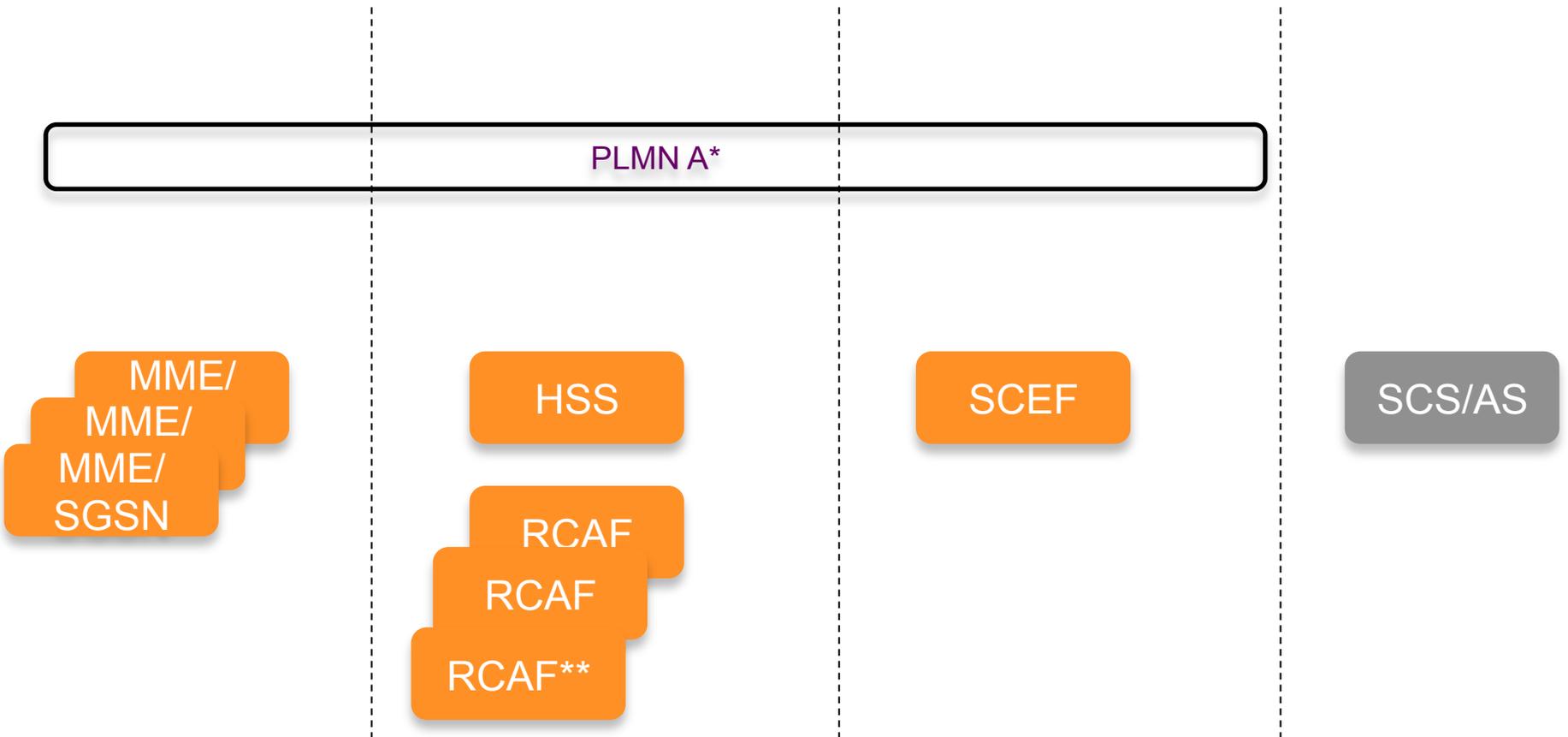
Problem Statement

Who owns the SCEF?

- Next set of slides look at select ownership models of SCEF in relation to other nodes
 - A.xx: Analyzes select HSS/MME/SGSN soln options for MONTE/AESE/HLCom
 - P.xx: Analyzes PCRF based option for MONTE/AESE
- Contention is wrt “Who owns SCEF”
- Note, in 23.203 5.2.1 there is precedence for AF being a 3rd party server
 - AF operates on PCRF which operates on per UE per IP-CAN session

A.1 SCEF Ownership

PLMN A (HSS, SCEF, MME/SGSN)

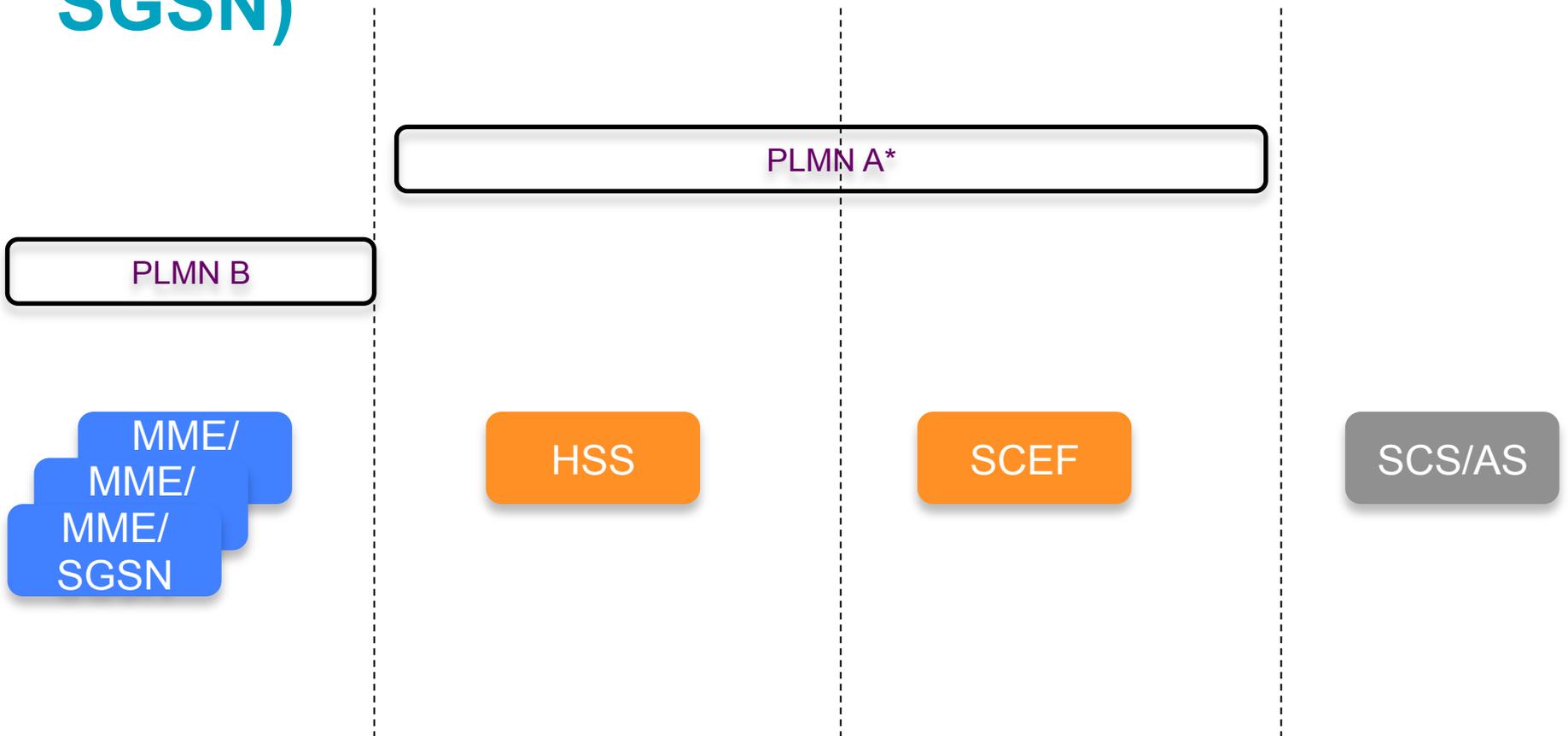


*: PLMN A may "own" SCEF or may have agreement towards 3rd party to develop/maintain it

** : Other NE such as GCS-AS etc also apply here. But not shown in subsequent figures for brevity

A.2 SCEF Ownership

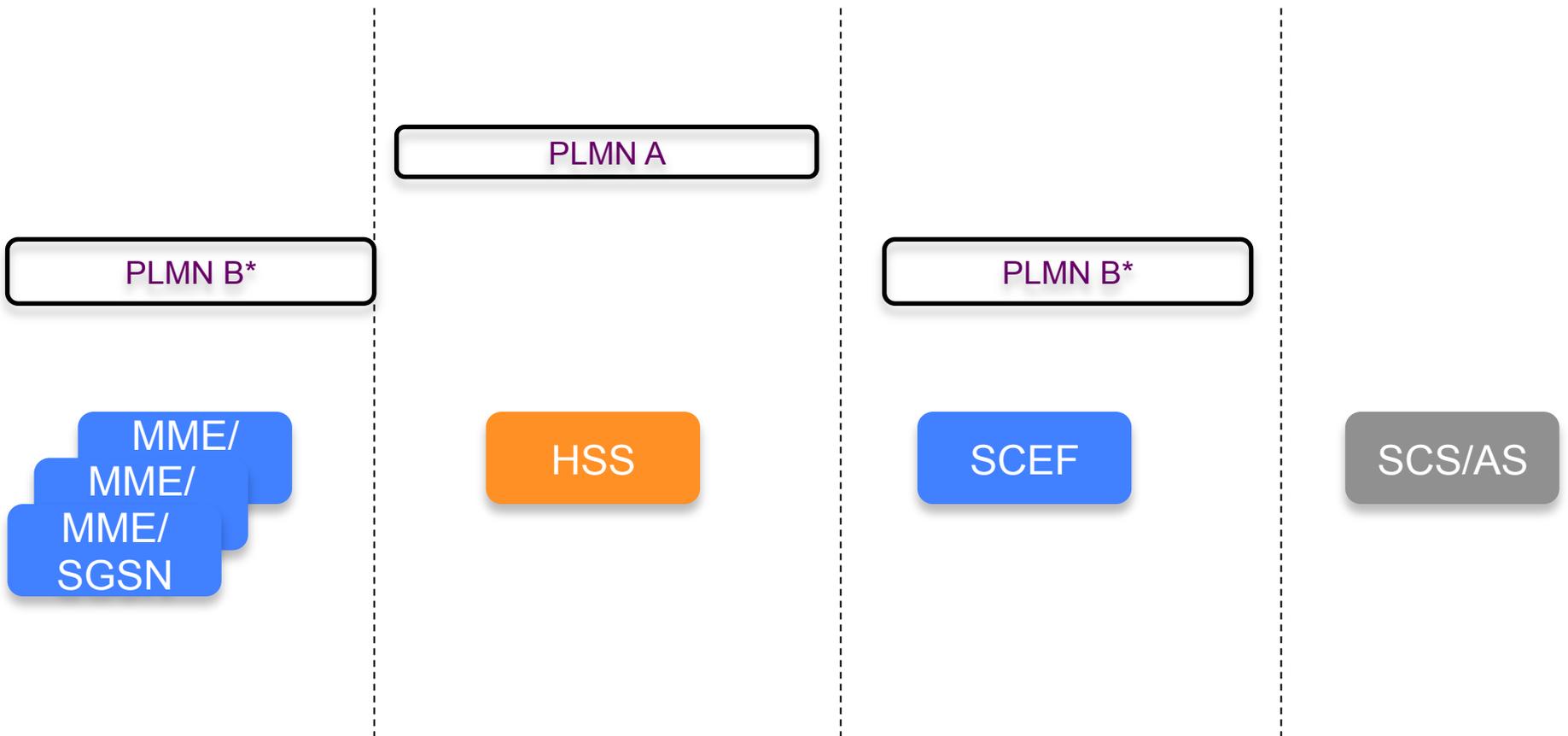
PLMN A (HSS, SCEF), PLMN B (MME/SGSN)



*: PLMN A may “own” SCEF or may have agreement towards 3rd party to develop/maintain it

A.3 SCEF Ownership

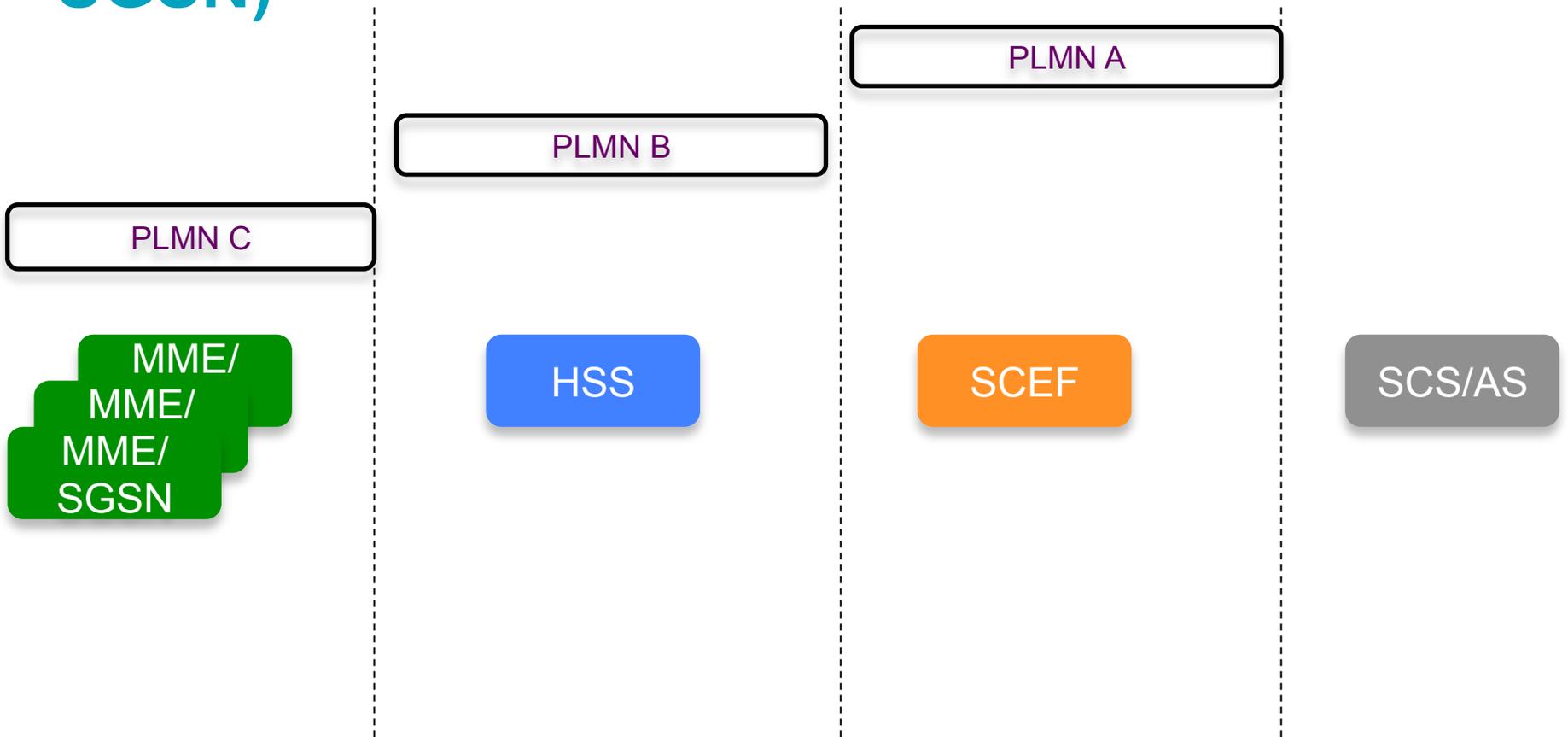
PLMN A (HSS), PLMN B(SCEF, MME/SGSN)



*: PLMN B may “own” SCEF or may have agreement towards 3rd party to develop/maintain it

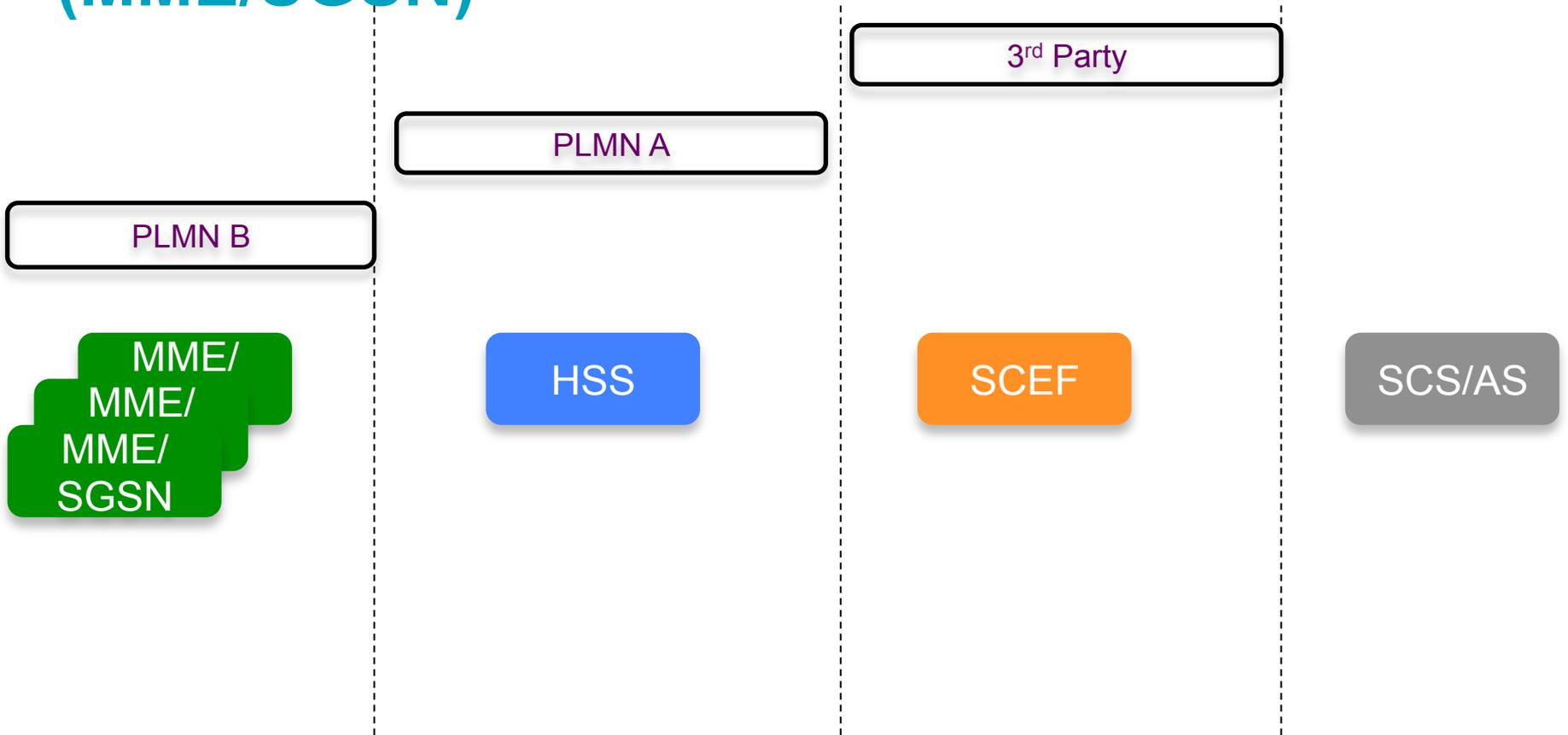
A.4 SCEF Ownership

PLMN A (SCEF), PLMN B (HSS), PLMN C (MME/SGSN)



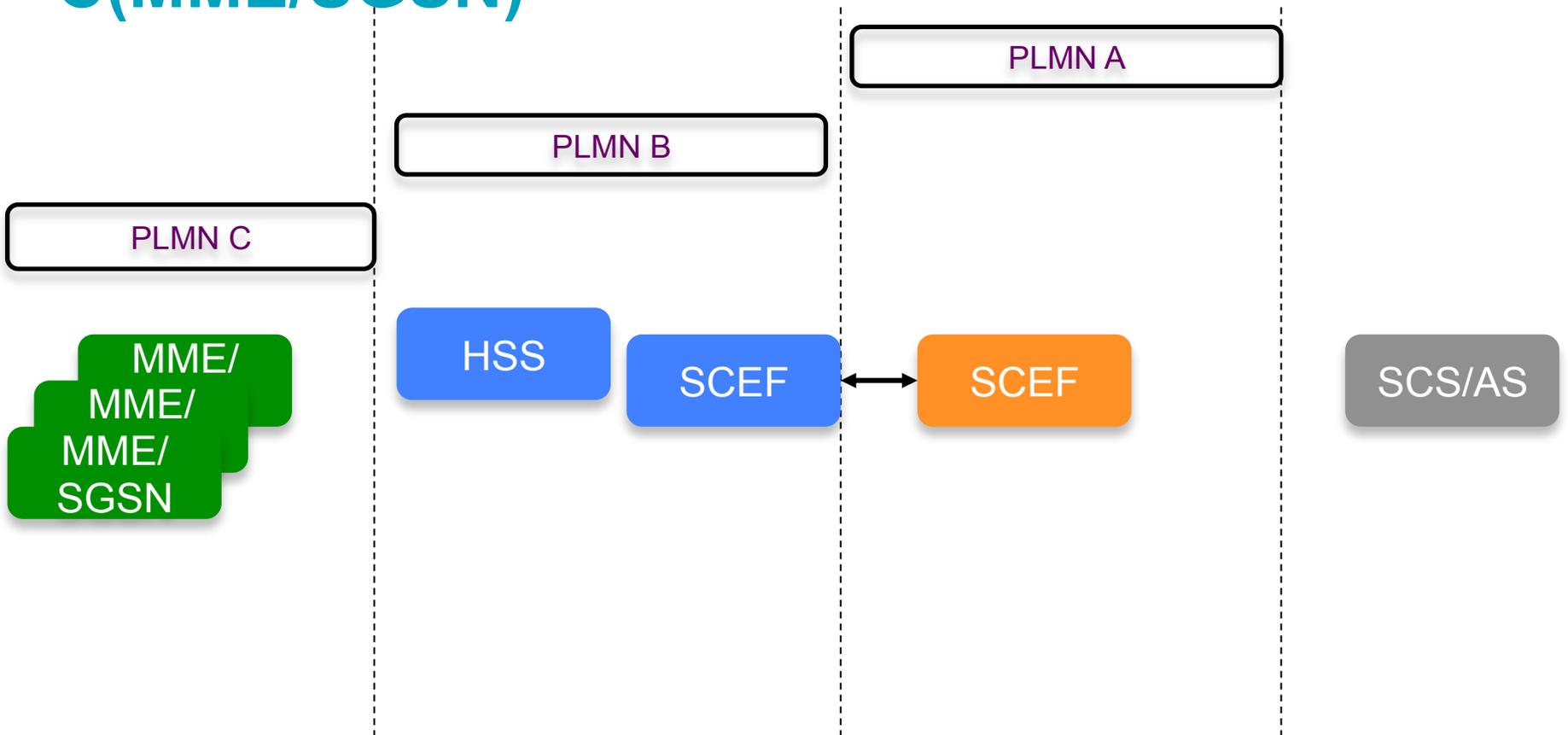
A.5 SCEF Ownership

3rd party (SCEF), PLMN A (HSS), PLMN B (MME/SGSN)

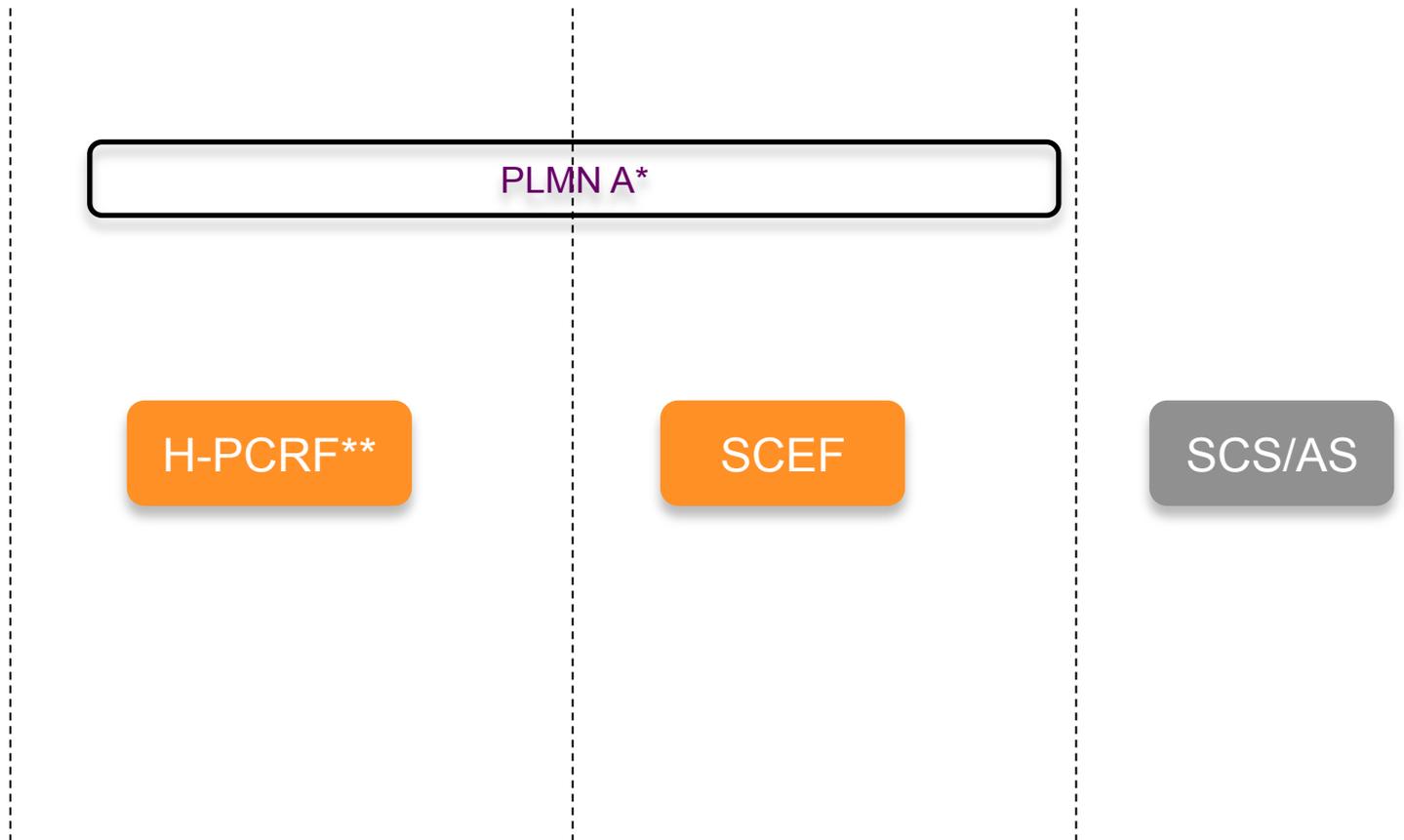


A.6 SCEF Ownership

PLMN A (SCEF), PLMN B (HSS, SCEF), PLMN C(MME/SGSN)



P.1 SCEF Ownership PLMN A (PCRF, SCEF)

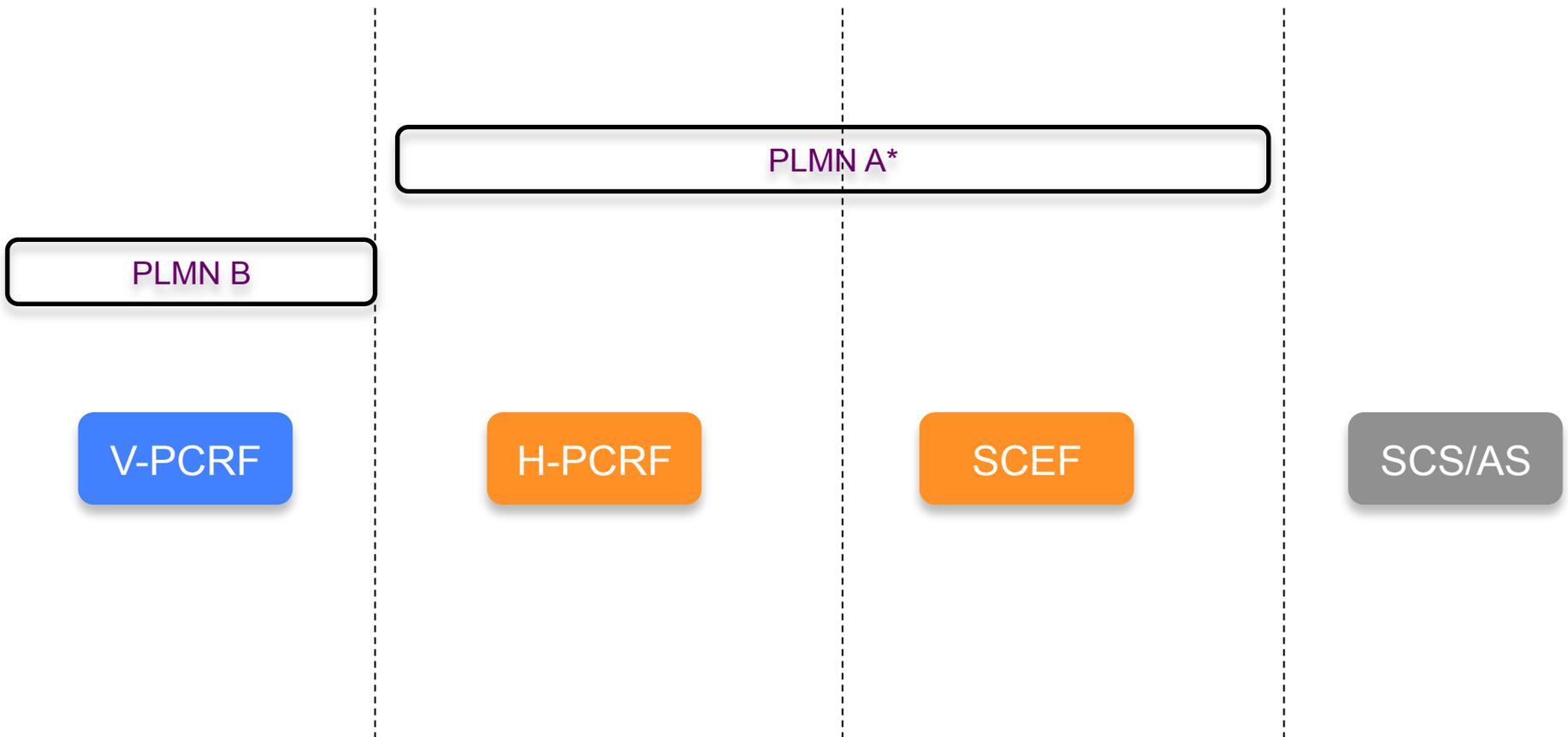


*: PLMN A may “own” SCEF or may have agreement towards 3rd party to develop/maintain it

** : Rx between AF-PCRF can be 3rd party owned already (per 23.203)

P.2 SCEF Ownership

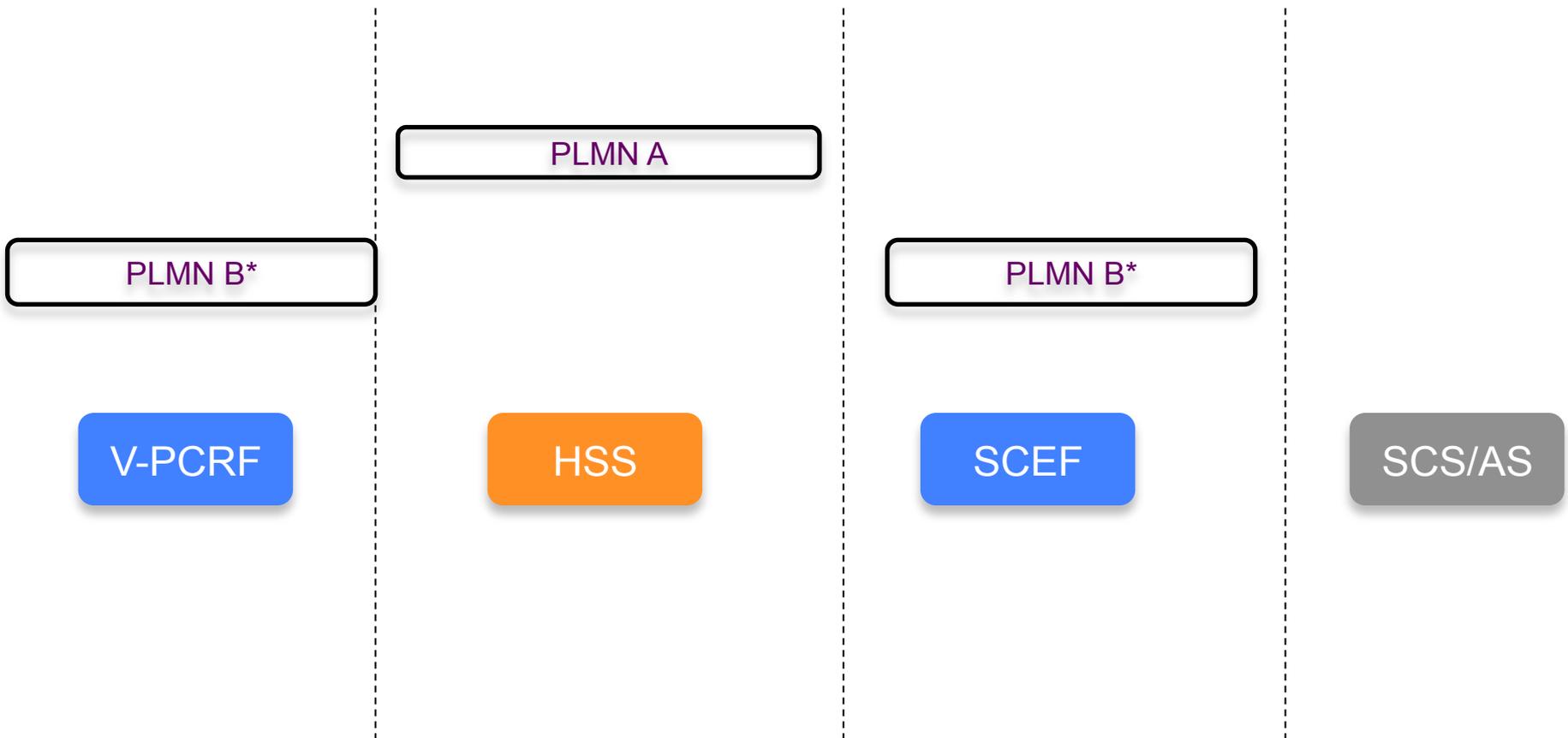
PLMN A (SCEF, H-PCRF), PLMN B(V-PCRF)



*: PLMN A may “own” SCEF or may have agreement towards 3rd party to develop/maintain it

P.3 SCEF Ownership

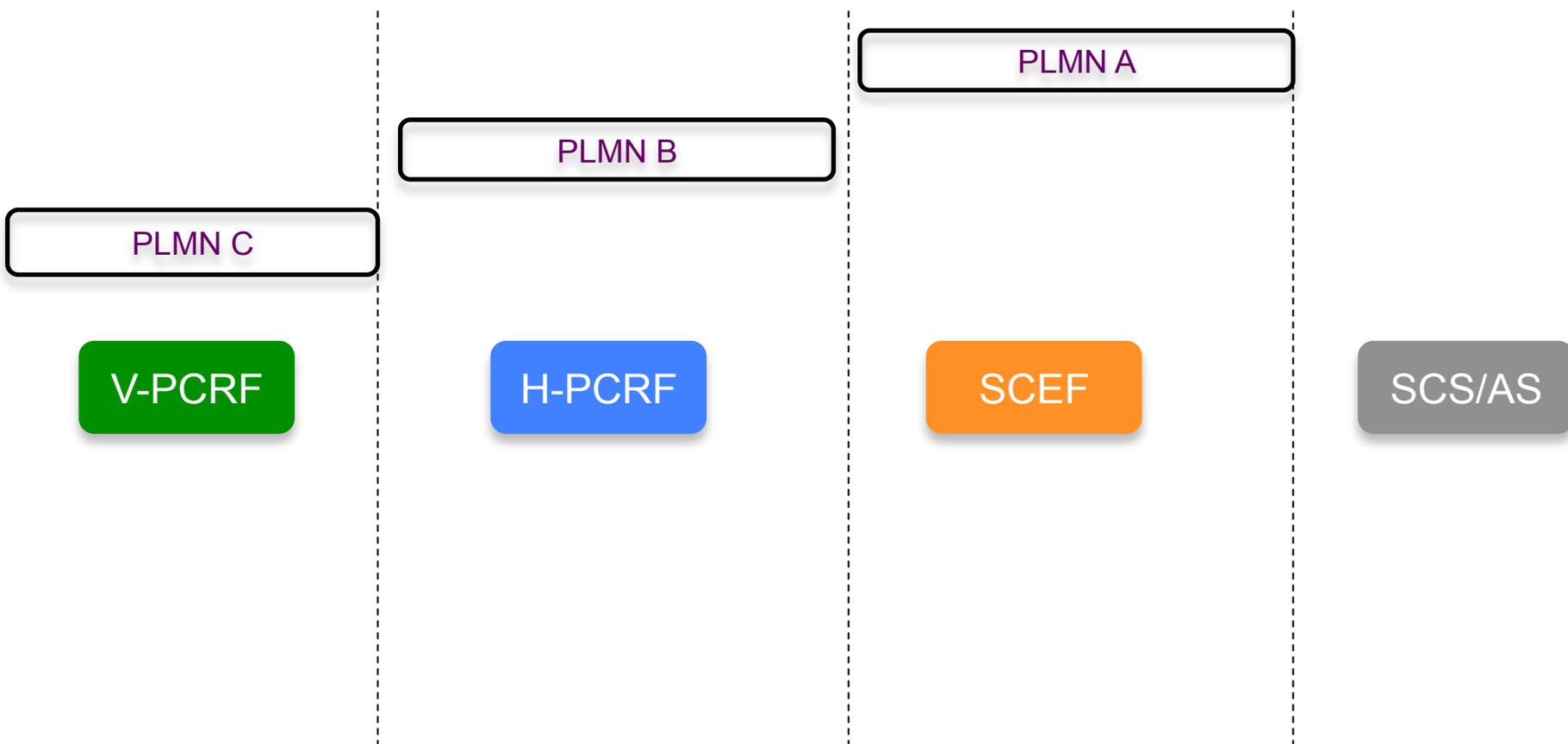
PLMN A (H-PCRF), PLMN B(SCEF, V-PCRF)



*: PLMN B may “own” SCEF or may have agreement towards 3rd party to develop/maintain it

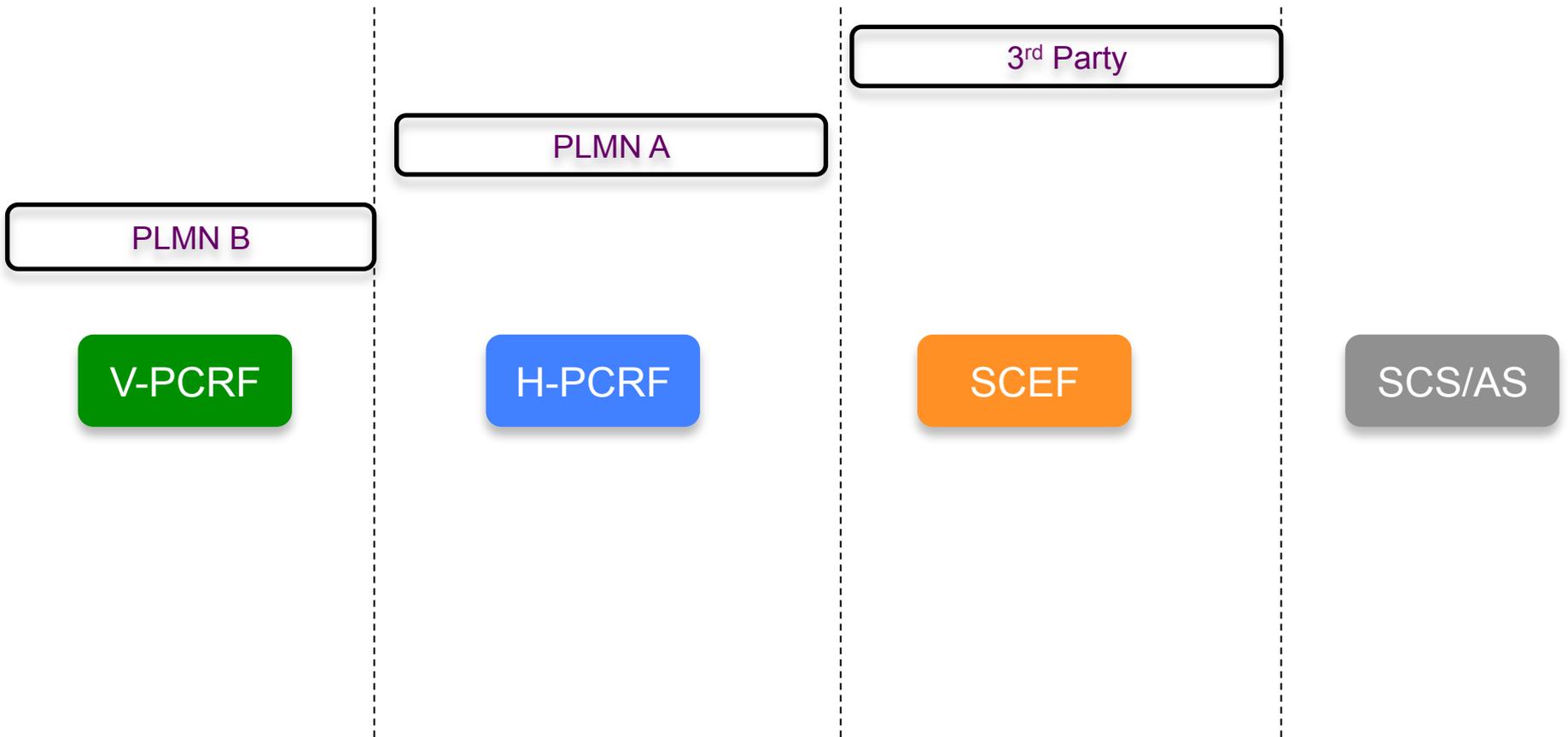
P.4 SCEF Ownership

PLMN A (SCEF), PLMN B (H-PCRF), PLMN C (V-PCRF)



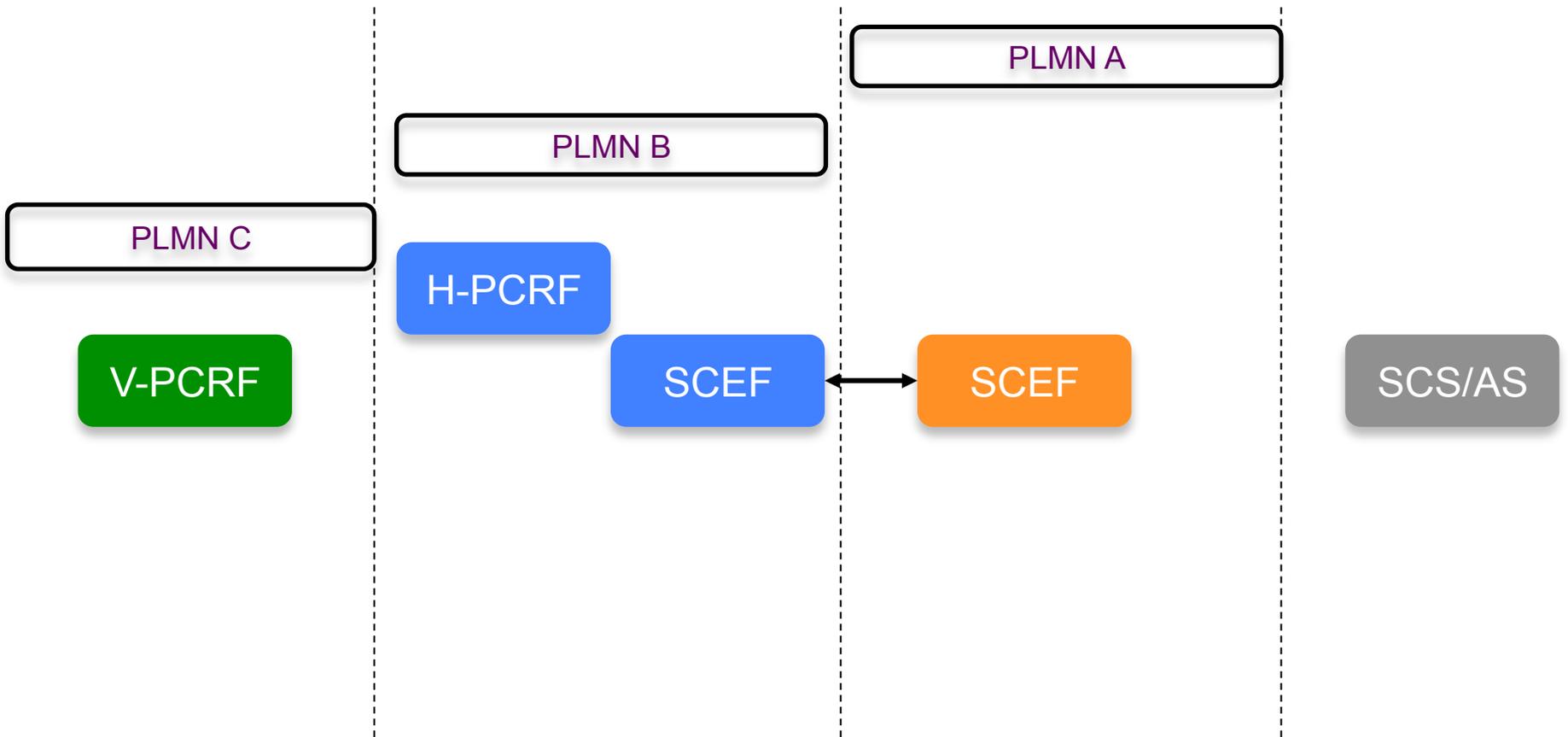
P.5 SCEF Ownership

3rd Party (SCEF), PLMN A (H-PCRF), PLMN B (V-PCRF)



P.6 SCEF Ownership

PLMN A (SCEF), PLMN B (H-PCRF, SCEF), PLMN C (V-PCRF)



SCEF Ownership

Proposed Way Forward (1)

| Option | Comment | Support in normative specs |
|--------|---|----------------------------|
| A.1 | De-facto; UE @HPLMN | Yes |
| A.2 | UE @VPLMN; Normal roaming case; Operator SLA exists between involved PLMN providers | Yes |
| A.3 | VPLMN has SCEF of its own; in-bound roamer; ; Operator SLA exists between involved PLMN providers | Yes |
| A.4 | UE@VPLMN; Each node is under different PLMN ownership; Operator SLA exists between all PLMN providers | Yes |
| A.5 | UE@VPLMN; SCEF is owned by 3 rd party; Operator SLA exists between PLMN providers; Operator SLA exists between PLMN (A, B) provider and 3 rd party provider as well | Yes |
| A.6 | Inter SCEF i/f | No |

SCEF Ownership

Proposed Way Forward (2)

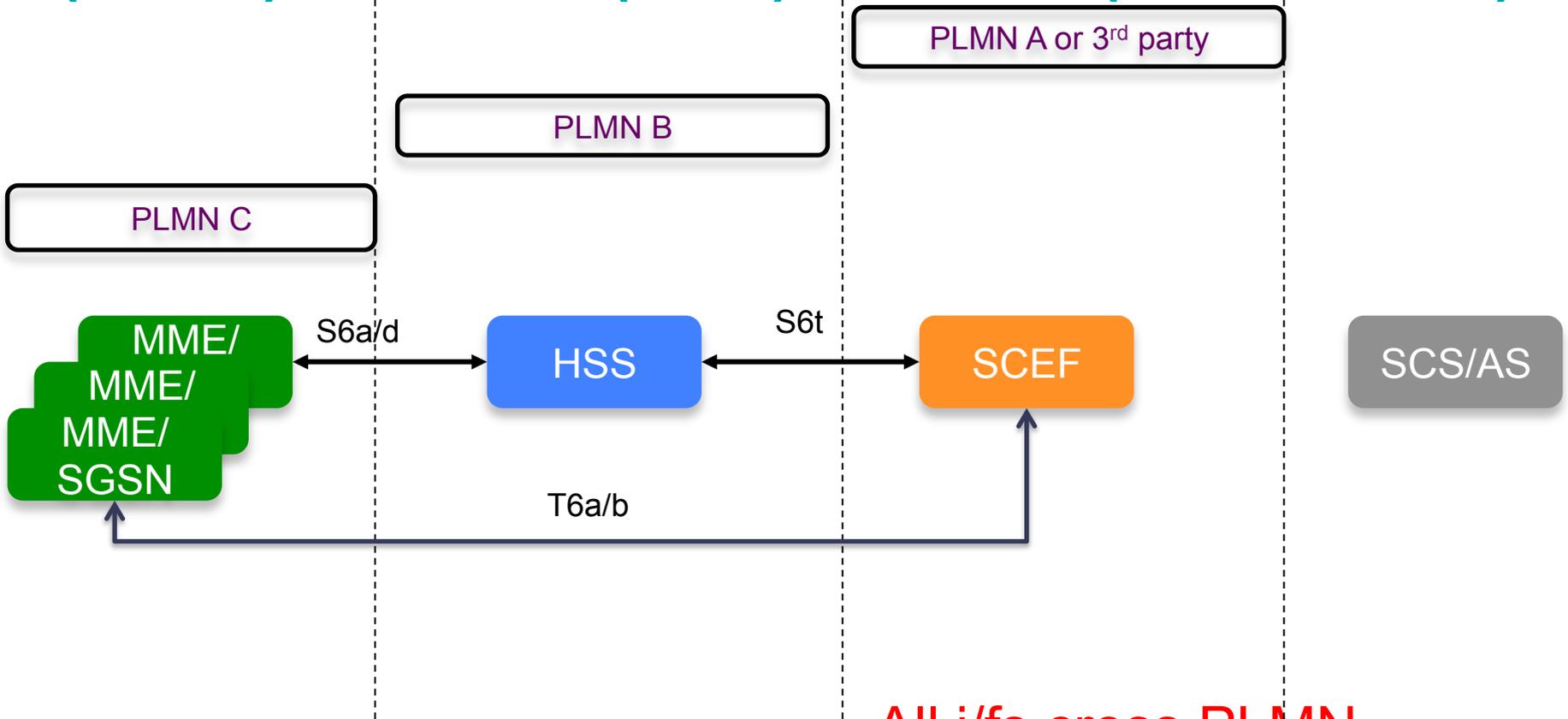
| Option | Comment | Support in normative specs |
|--------|---|----------------------------|
| P.1 | UE @HPLMN | Yes |
| P.2 | UE @VPLMN | Yes |
| P.3 | UE@VPLMN; SCEF is owned by v-PLMN | Yes |
| P.4 | UE @VPLMN; SCEF is owned by PLMN different than other nodes | Yes |
| P.5 | UE @VPLMN; SCEF is 3 rd party owned | Yes |
| P.6 | Inter-SCEF i/f | No |

Roaming*

*: Only Most complex scenarios depicted

Roaming

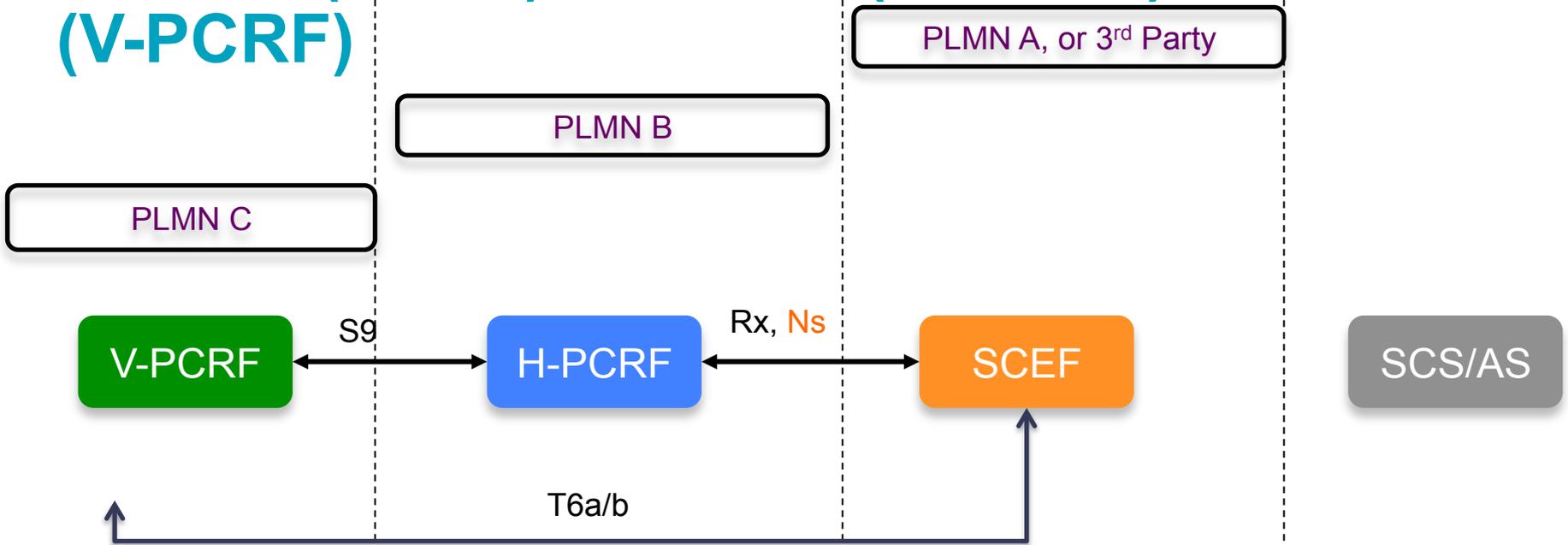
B.1 (A.4, A.5 scenario) PLMN A or 3rd party (SCEF), PLMN B (HSS), PLMN C (MME/SGSN)



All i/fs cross PLMN boundaries

Roaming

B.3 (P.5, P.6 Scenario) 3rd party (SCEF) or PLMN A(SCEF), PLMN A (H-PCRF), PLMN B (V-PCRF)



S9: Already roaming i/f

Rx: AF can be 3rd party owned (per 23.203)

Ns: New i/f crossing PLMN boundary

Roaming

Can we consider Roaming in-scope for Rel-13?

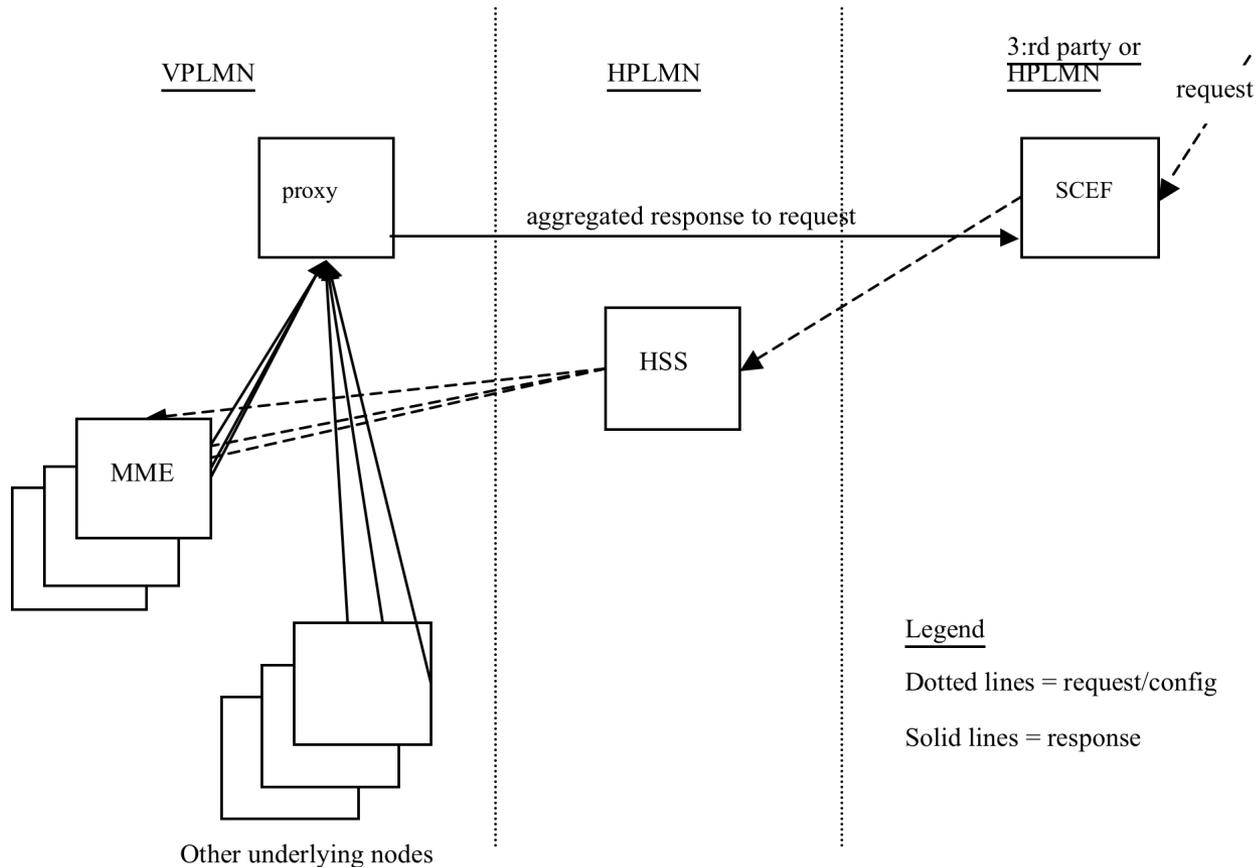
| Interface | Comment | Should we consider it as Roaming i/f |
|-----------|---|---|
| S6a/d | Already roaming i/fs per existing specs | Yes (already considered roaming per existing specs) |
| S6t | Even if 3 rd party SCEF ownership is excluded, SCEF can be owned by different PLMN provider than HPLMN/VPLMN | Yes |
| T6a/d | Even if SCEF is owned by HPLMN, when a UE roams into VPLMN, this interface becomes inter-operator i/f | Yes |
| S9 | Already roaming i/f | Yes (already considered roaming per existing specs) |
| Rx | AF can already be owned by 3 rd party; crosses PLMN boundary | Yes (already considered roaming per existing specs) |
| Ns | New non-UE specific i/f between SCEF which crosses PLMN boundary | Yes |

Roaming Background

- Wherever PLMN boundaries are crossed appropriate security measures are taken by operators
 - SeGWs
 - IP-level security
 - GTP-level security
 - DIAMETER-level security
 - ...

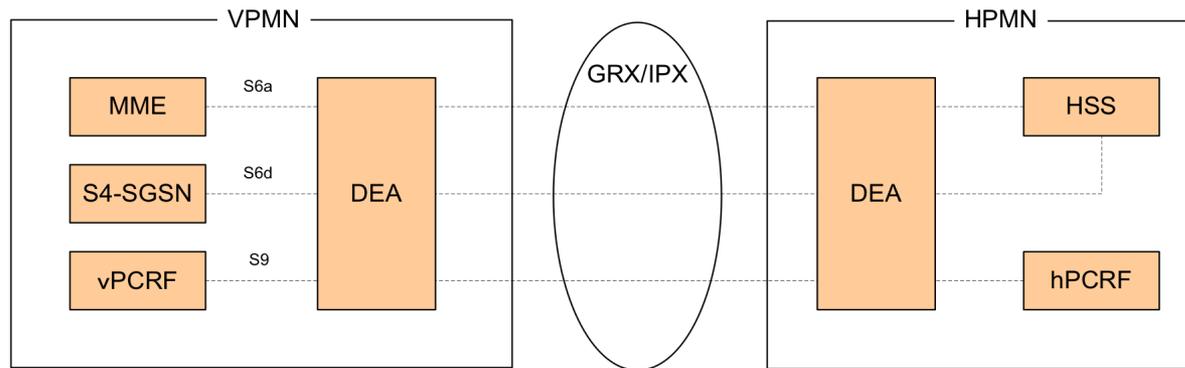
Roaming

/// Paper (S2-15xxx) proposes Aggregation Proxy to allow roaming support



Roaming

GSMA IR.88 provides LTE Roaming Arch



- For normal cases (w/o AESE/MONTE features) HSS may have to communicate w/ multiple MMEs in VPLMN, DEAs are recommended to be deployed at both H/VPLMN
- If S6t, T6a/d, Ns == DIAMETER (stage 3 decision), then GSMA can add these i/fs to DEA
- Else, depending on Stage 3 protocol selection for these interfaces, equivalents of DEA/GTP-proxies can be added by GSMA as well

Roaming

Proposed Way Forward

- S6t, T6a/b, Ns are considered to be roaming interfaces
- Whether or not aggregation proxies are required at PLMN edge (needed on both sides) is left out of 3GPP scope
 - GSMA can discuss this if required

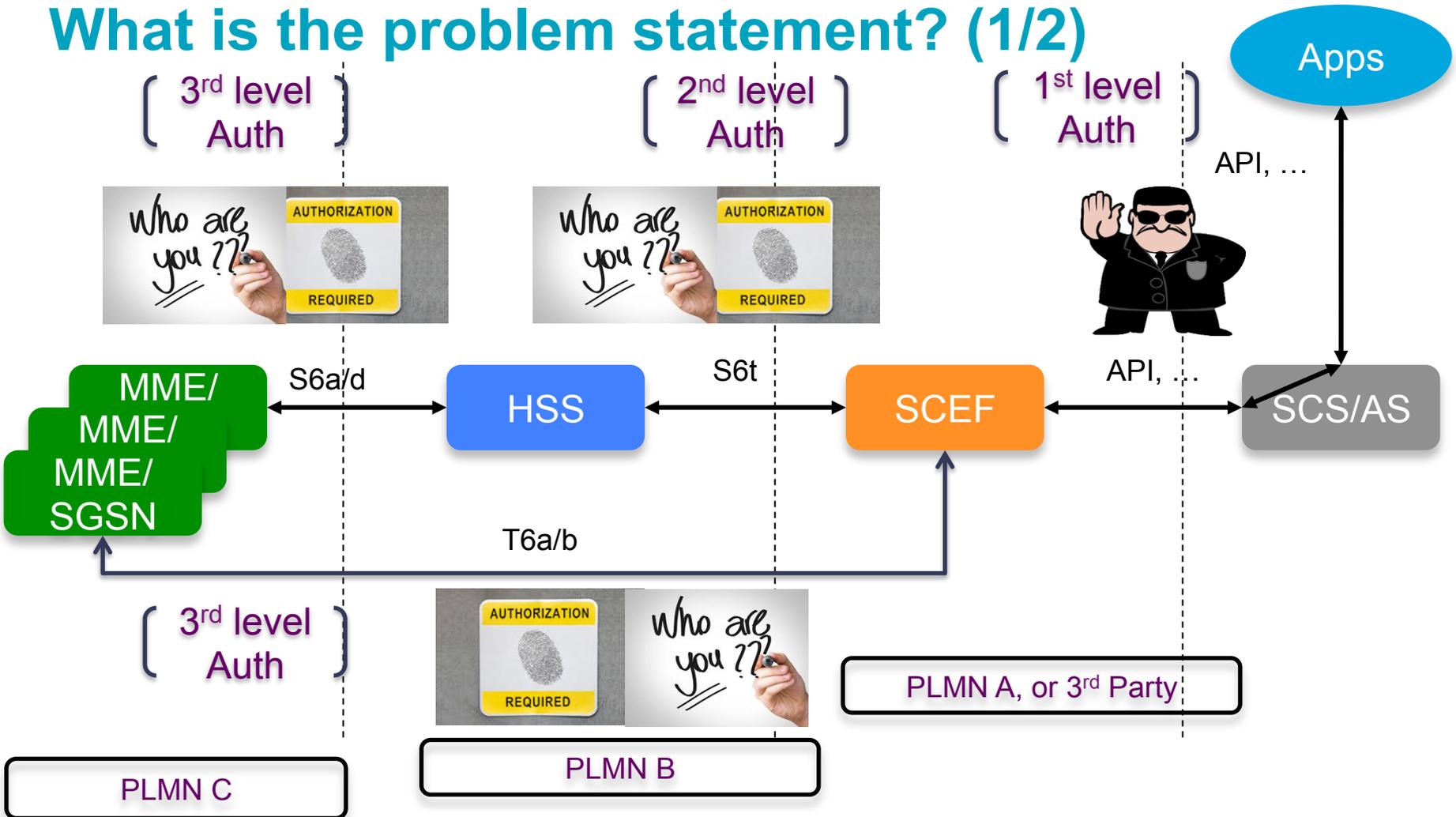
Authorization levels*

*: Only Major ownership scenarios depicted

Authorization

When HSS/MME/SGSN are used

What is the problem statement? (1/2)



Authorization

When HSS/MME/SGSN are used

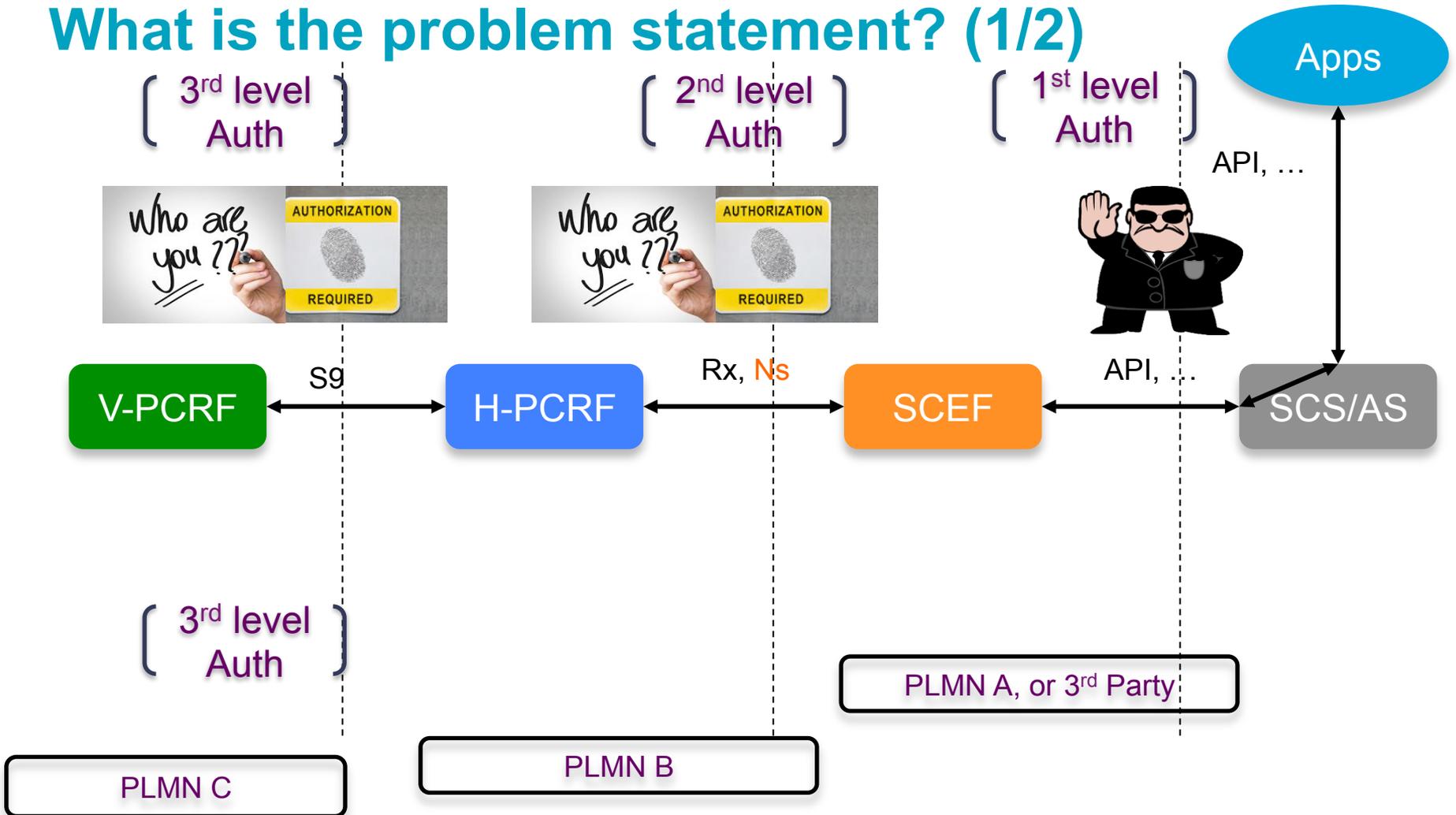
What is the problem statement? (2/2)

- 1st level Auth
 - SCEF authorizing SCS/AS/apps
- 2nd level Auth (HSS authorizing S6t request)
 - Is it required?
 - If so, who is being authorized by HSS?
 - App? If so, what ID is used?
 - SCS/AS? If so, what ID is used?
 - SCEF? If so, what ID is used?
 - And for what?
 - All supported (MONTE + AESE + GROUPE + HLCom + xx) Events?
 - Per (MONTE + AESE + GROUPE + HLCom + xx) Events?
- 3rd level Auth
 - Is it required?
 - UE-specific events:
 - MME/SGSN authorizing S6t request via S6a/d so that T6a/b i/f can be sent
 - (same questions as 2nd level auth apply esp when PLMN of MME/SGSN is diff to HSS and/or SCEF)
 - Non-UE specific events:
 - MME/SGSN authorizing T6a/b request so that T6a/b responses can be sent
 - (same questions as 2nd level auth apply esp when PLMN of MME/SGSN is diff to SCEF)

Authorization

When PCRF is used

What is the problem statement? (1/2)



Authorization

When PCRF is used

What is the problem statement? (2/2)

- 1st level Auth
 - SCEF authorizing SCS/AS/apps
- 2nd level Auth (H-PCRF authorizing S6t request)
 - Is it required?
 - If so, who is being authorized by PCRF?
 - App? If so, what ID is used?
 - SCS/AS? If so, what ID is used?
 - SCEF? If so, what ID is used?
- 3rd level Auth (V-PCRF authorizing S9 request)
 - Is it required?
 - If so, who is being authorized by PCRF?
 - App? If so, what ID is used?
 - SCS/AS? If so, what ID is used?
 - SCEF? If so, what ID is used?

Authorization Proposed Way Forward

| Levels | SCEF | HSS | MME/SGSN | PCRF |
|-----------------------|-------------------|---|---|--|
| 1 st level | Out of 3GPP scope | - | - | - |
| 2 nd level | - | <p>SCEF access to HSS governed based on SLAs (inter-PLMN SLAs or PLMN-3rd party SLAs)</p> <p>Anything else is Optional and Implementation specific to HSS but not specified in Rel-13</p> | - | <p>Rx: existing DIAMETER procedures apply</p> <p>Ns: SCEF access to PCRF governed based on SLAs (inter-PLMN SLAs or PLMN-3rd party SLAs)</p> |
| 3 rd level | - | - | <p>SCEF access to MME/SGSN (for S6t and T6a/b procedures) governed based on SLAs (inter-PLMN SLAs or PLMN-3rd party SLAs)</p> <p>Anything else is Optional and Implementation specific to HSS but not specified in Rel-13</p> | <p>NOT REQUIRED</p> <p>(MONTE events: Already agreed that No Rx changes. So, no S9 changes either.</p> <p>AESE events: Some events Rx changes are required but requests/responses will go via H-PCRF anyways, so same approach as MONTE)</p> |

Thank you.

