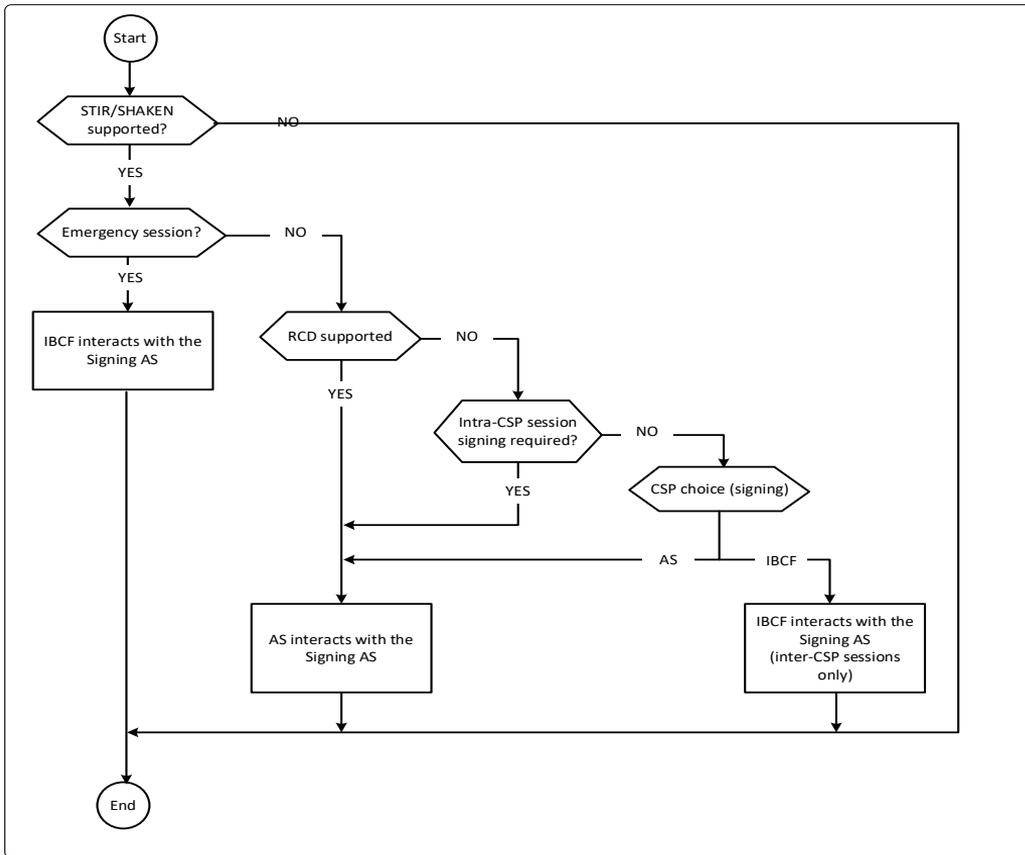


STIR/SHAKEN LI enhancements - Part III (enhancing the triggering algorithms)

Nagaraja (Nag) Rao; Boca Raton, FL

Enhanced Algorithm (originating end)

Determining the IMS NF that has the IRI-POI for STIR/SHAKEN



The AS interacts with the Signing AS when any of the following is true:

- RCD is supported.
- Intra-CSP session signing is required.
- CSP choice for signing is AS.

The IBCF interacts with the Signing AS when all of the following are true:

- RCD is not supported.
- Intra-CSP signing is not required.
- CSP choice for signing is IBCF.

The IBCF also interacts with the Signing AS for an IMS emergency session.

Enhancing the TS 33.128 (clause 7.11.2.2) – 1 of 3

The IRI-POI present in the Telephony AS or IBCF, shall generate an xIRI containing a STIRSHAKENSignatureGeneration record **when under** the following conditions: ~~are met:~~

- Telephony AS or IBCF is interacting with the SIGNING AS. Whether it is the Telephony AS or IBCF for sessions is based on network configuration and local policy of the CSP **as described in the clause 7.11.2.4. Whether it is IBCF for MSISDN-less SMS is based on network configuration and local policy of the CSP.**
- **When** P-Asserted Identity or From header of SIP INVITE or SIP MESSAGE request received from S-CSCF is a target identity with the conditions mentioned below:
 - The identities in one or both of those headers are used to interact with the Signing AS.
 - The "shaken" PASSporT is not received in the SIP INVITE request from the S-CSCF.
 - The "shaken" PASSporT is received from the Signing AS.
 - The "shaken" PASSporT is included in the outgoing SIP INVITE or SIP MESSAGE.
- When the "DivPASSporTScope" parameter is set to "YES" in the ActivateTask with P-Asserted Identity or From header of SIP INVITE or SIP MESSAGE request received from S-CSCF is a target identity with the conditions mentioned below:
 - The identities in one or both of those headers are used to interact with the SIGNING AS.
 - A "shaken" PASSporT or a "div" PASSporT with those identities are included in the "orig" claim of "shaken" or "div" PASSporT received from the SIGNING AS .
 - The "shaken" PASSporT or a "div" PASSporT with those identities are included in the "orig" claim of "shaken" or "div" PASSporT in the outgoing SIP INVITE or SIP MESSAGE.

Enhancing the TS 33.128 (clause 7.11.2.2) – 1 of 2

- When Diversion header or the History Info of SIP INVITE request received from the S-CSCF is a target identity with the conditions mentioned below:
 - The identities in one or both of those headers are used to interact with the Signing AS.
 - The "div" PASSporT with those identities in the "div" claim is not received in the SIP INVITE request from the S-CSCF.
 - The "div" PASSporT with those identities in the "div" claim is received from the Signing AS.
 - The "div" PASSporT with those identities in the "div" claim is included in the outgoing SIP INVITE.
- When the "DivPASSporTscope" parameter is set to "YES" in the ActivateTask with Diversion or HistoryInfo header of SIP INVITE request received from S-CSCF includes the target identity with the conditions mentioned below:
 - The identities in P-Asserted Identity or From of SIP INVITE received from the S-CSCF are used to interact with the SIGNING AS.
 - A "div" PASSporT with the identities in P-Asserted Identity or From of SIP INVITE request received from S-CSCF are included in the "orig" claim of "div" PASSporT received from the SIGNING AS .
 - The "div" PASSporT with the identities in P-Asserted Identity or From of SIP INVITE request received from S-CSCF are included in the "orig" claim of "div" PASSporT in the outgoing SIP INVITE.
- When Request URI of outgoing SIP INVITE is a target non-local ID and is present in the "dest" claim of "shaken" or "div" PASSporT received from the SIGNING AS and the same is included in the outgoing SIP INVITE.
- When Request URI of outgoing SIP MESSAGE is a target non-local ID and is present in the "dest" claim of "shaken" PASSporT received from the SIGNING AS and the same is included in the outgoing SIP MESSAGE.

Enhancing the TS 33.128 (clause 7.11.2.2) – 3 of 3

- When Telephony AS is interacting with the Signing AS, and when Request URI of SIP INVITE received from the S-CSCF is a target identity with the conditions mentioned below:
 - The identity is used to interact with the Signing AS.
 - The "div" PASSporT with that identity in the "div" claim is received from the Signing AS.
 - The "div" PASSporT with that identity in the "div" claim is included in the outgoing SIP INVITE.
- ~~A PASSporT is received from the SIGNING AS and is included in an outgoing SIP INVITE or SIP MESSAGE request in a SIP Identity header.~~
- ~~Based on RFC 8946 [76], SIP retargeting creates a new Identity header signed by the SIGNING AS and containing the "div" claim to attach to the sessi~~

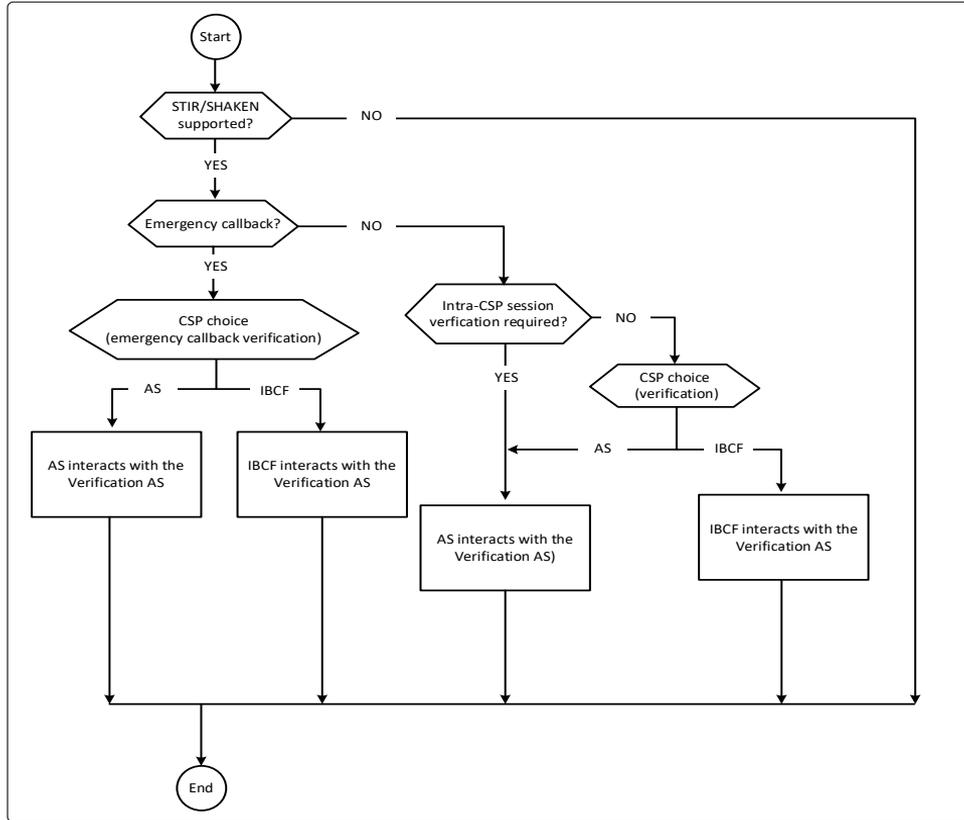
When the target is not a non-local ID, the STIRSHAKENSsignatureGeneration includes only the PASSporT received in the SIGNING AS response with the following rules:

- When the "DivPASSporTScope" parameter is set to "YES" in the ActivateTask, then all of the PASSporT received from the SIGNING AS.
- When the "DivPASSporTScope" parameter is set to "NO" in the ActivateTask:
 - If P-Asserted Identity or From header in the SIP INVITE or SIP MESSAGE received from the S-CSCF is a target identity, then only "shaken" PASSporT received from the SIGNING AS with those identities in the "orig" claim of the "shaken" PASSporT.
 - If Diversion or HistoryInfo header in the SIP INVITE received from the S-CSCF is a target identity, then only the "div" PASSporT received from the SIGNING AS with those identities in the "div" claim of "div" PASSporT.
 - If REQUEST URI or To header in the SIP INVITE received from the S-CSCF is a target identity, then only the "div" PASSporT received from the SIGNING AS with those identities in the "div" claim of "div" PASSporT.

When the target is non-local ID, STIRSHAKENSsignatureGeneration includes all of the PASSporT included in the outgoing SIP message.

Enhanced Algorithm (terminating network)

When the IMS NF that interacts with the Verification AS



The AS interacts with the Verification AS when any of the following is true:

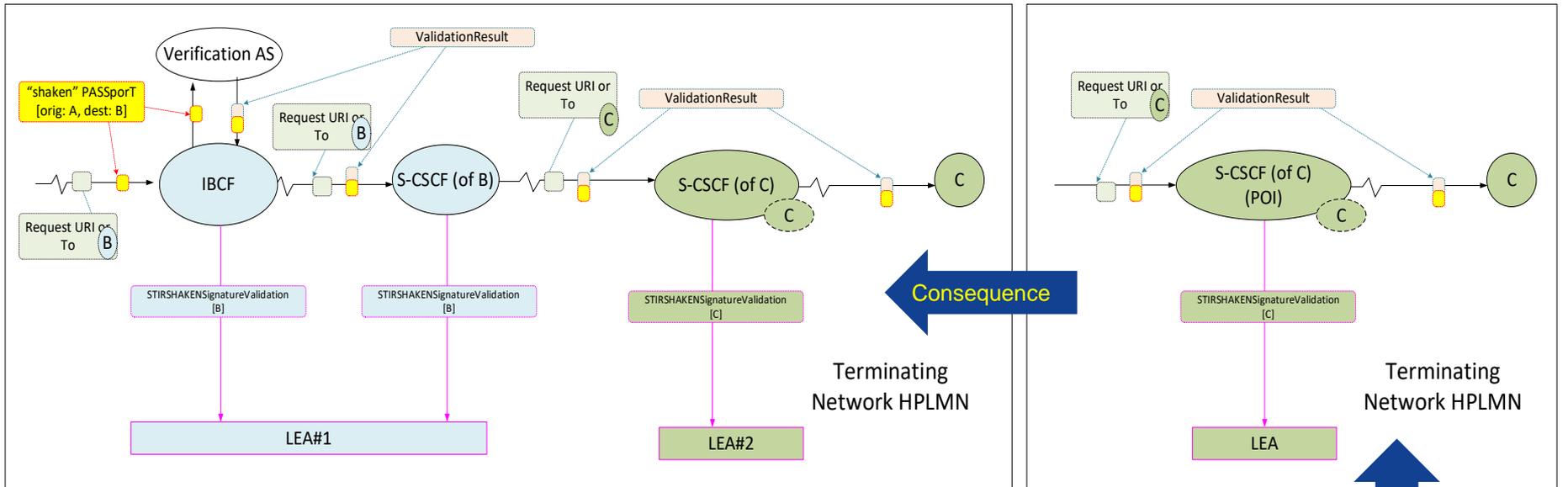
- Intra-CSP session verification is required.
- CSP choice for verification is AS.
- CSP choice for emergency session callback verification is AS.

The IBCF interacts with the Verification AS when all of the following are true:

- Intra-CSP signing is not required.
- CSP choice for verification is IBCF.

The IBCF also interacts with the Verification AS for an IMS emergency session call back when the CSP choice for verification for emergency callback session is IBCF.

Seeking a solution when the redirected-to party is a target and AS does not interact with the Verification AS

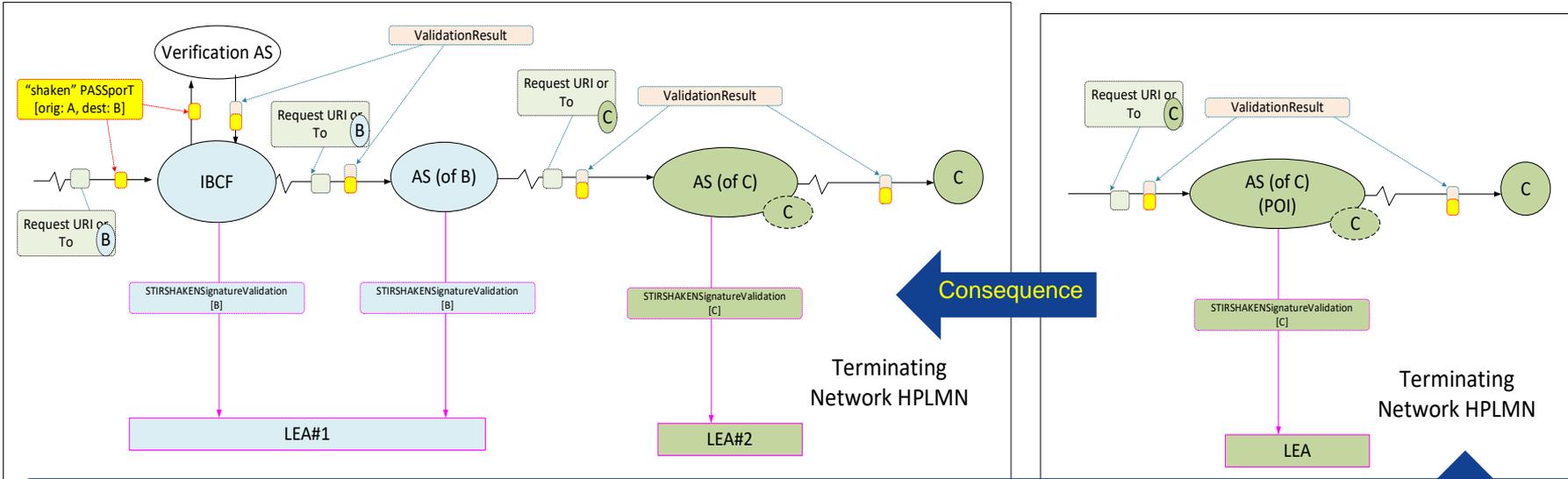


The IRI-POI present in the **S-CSCF** shall generate an xIRI containing a STIRSHAKENSignatureValidation record when the following conditions are met:

- With one or more of the following are true:
 - Request URI or To header of SIP INVITE or SIP MESSAGE request sent to the UE is a target identity.
 - SIP INVITE or SIP MESSAGE request sent to the UE includes SIP Call-Info headers containing possible RCD data or eCNAM data, and the result of the PASSporT verification.

If S-CSCF that serves the target were to provide the IRI-POI

Seeking a solution when the redirected-to party is a target and AS does not interact with the Verification AS

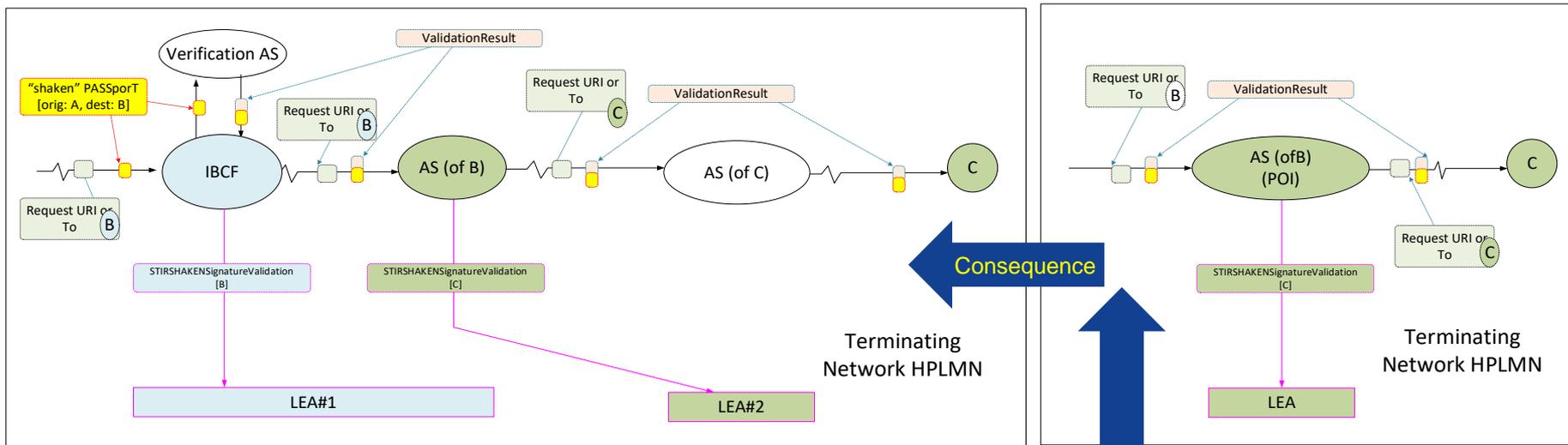


The IRI-POI present in the **Telephony AS** shall generate an xIRI containing a STIRSHAKENSignatureValidation record when the following conditions are met:

- With one or more of the following are true:
 - Request URI or To header of SIP INVITE or SIP MESSAGE request sent to the UE is a target identity.
 - SIP INVITE or SIP MESSAGE request sent to the UE includes SIP Call-Info headers containing possible RCD data or eCNAM data, and the result of the PASSporT verification.

AS may not have the concept of served UE. Still if AS (C) were to provide the IRI-POI

Seeking a solution when the redirected-to party is a target and AS does not interact with the Verification AS (Chosen)



The IRI-POI present in the S-CSCF shall also generate an xIRI containing a STIRSHAKENSignatureValidation record when it detects the following conditions:

- Session is redirected.
- Request URI header of outgoing SIP INVITE is a target identity.
- Validation result is included in the outgoing SIP INVITE with the possible the RCD data and the eCNAM data as Call-Info headers.

Enhancing the TS 33.128 (clause 7.11.2.3) – 1 of 2

The IRI-POI present in the Telephony AS or IBCF, shall generate an xIRI containing a STIRSHAKENSignatureValidation record under the following conditions:

- Either IBCF or Telephony AS, is interacting with the VERIFICATION AS. Whether it is the Telephony AS or IBCF for sessions is based on network configuration and local policy of the CSP. IBCF for MSISDN-less SMS, is based on network configuration and local policy of the CSP.
- With one or more of the following are true:
 - Request URI and To Headers of SIP INVITE or SIP MESSAGE request received from S-CSCF (in the case of Telephony AS) or from the previous IP network (in the case of IBCF) is a target identity.
 - One or more of P-Asserted Identity, From, Diversion, History-Info Headers of SIP INVITE request received from S-CSCF (in the case of Telephony AS) or from the previous IP network (in the case of IBCF) is a target non-local identity without any without any prior intra-network diversions.
 - One or more of P-Asserted Identity, From Headers of SIP MESSAGE request received from S-CSCF (in the case of Telephony AS) or from the previous IP network (in the case of IBCF) is a target non-local identity without any Diversion or History-Info headers.
- If PASSporTs are received in the SIP INVITE or SIP MESSAGE request, they are submitted by ~~the Telephony AS or~~ IBCF to the VERIFICATION AS for validation and the result is included in an outgoing SIP INVITE or SIP MESSAGE request together with possible RCD data or eCNAM data as Call-Info headers.
- If PASSporTs are received in the SIP INVITE or SIP MESSAGE request, they are submitted by the Telephony AS to the VERIFICATION AS for validation and **the validation result is received from the Verification AS** and the outgoing SIP INVITE or SIP MESSAGE possibly includes RCD data or eCNAM data as Call-Info headers.

NOTE: The IRI-POI may use the Via headers or Record-route headers to determine any prior intra-network diversions.

Enhancing the TS 33.128 (clause 7.11.2.3) – 2 of 2

The IRI-POI present in the Telephony AS shall also generate an xIRI containing a STIRSHAKENSignatureValidation record when it detects the following conditions:

- Session is redirected.
- Request URI header of outgoing SIP INVITE is a target identity.
- Validation result is included in the outgoing SIP INVITE with the possible the RCD data and the eCNAM data as Call-Info headers.

These conditions will have to be checked in the originating network as well if a call redirection and verification happens.

The IRI-POI present in the LMISF-IRI or P-CSCF (VPLMN) shall generate an xIRI containing a STIRSHAKENSignatureValidation record when the following conditions are met:

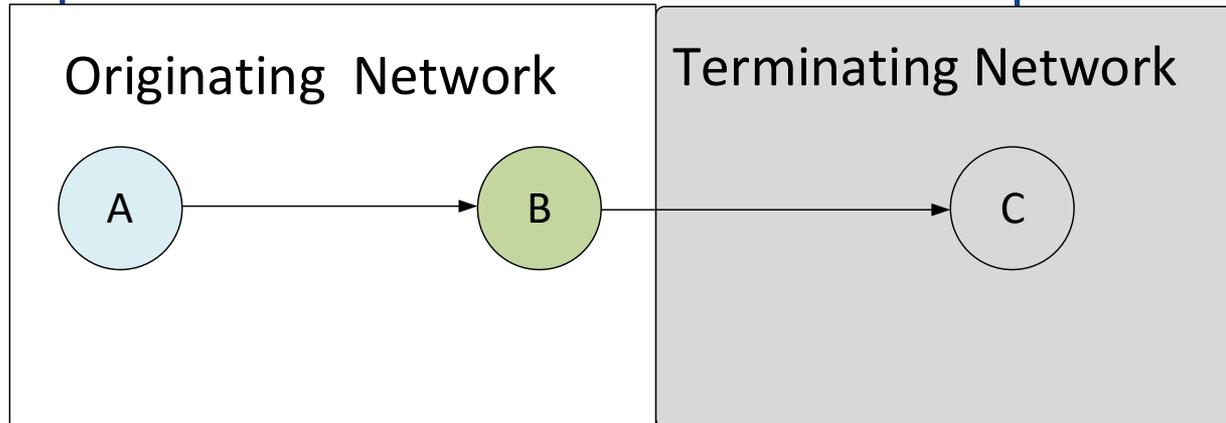
- With one or both of the following two are true:
 - Request URI or To header of SIP INVITE or SIP MESSAGE request sent to the UE is a target identity.
 - One or more of P-Asserted Identity, From, Diversion, History-Info Headers of SIP INVITE request sent to the UE is a target non-local identity.
 - One or more of P-Asserted Identity, From Headers of SIP MESSAGE request sent to the UE is a target non-local identity.
- SIP INVITE or SIP MESSAGE request sent to the UE includes SIP Call-Info headers containing possible RCD data or eCNAM data, and the result of the PASSporT verification.

Scenario 1

Originating end

A (target) calls B (target) redirected to C

Intra-CSP sessions are not signed/verified

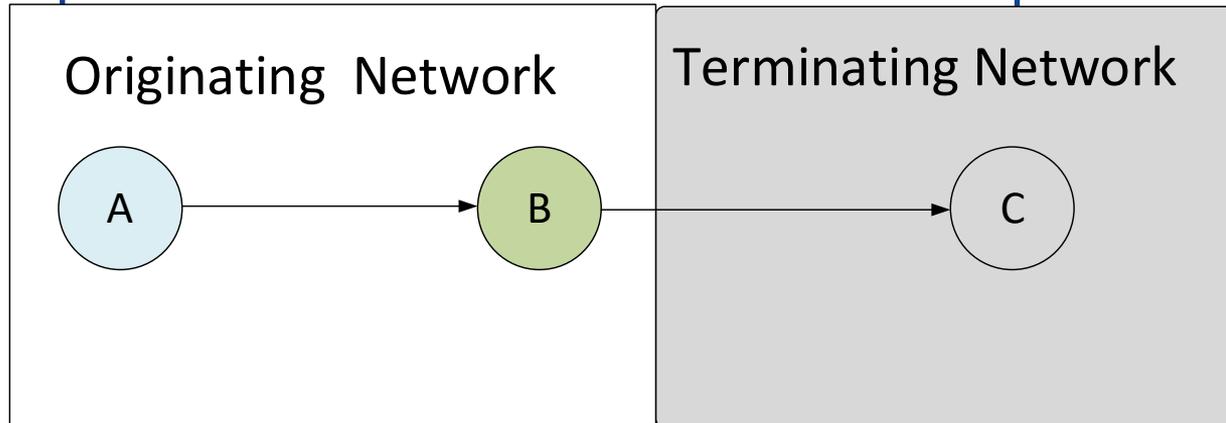


Scenario 2

Originating end

A (target) calls B (target) redirected to C

Intra-CSP sessions are not signed/verified

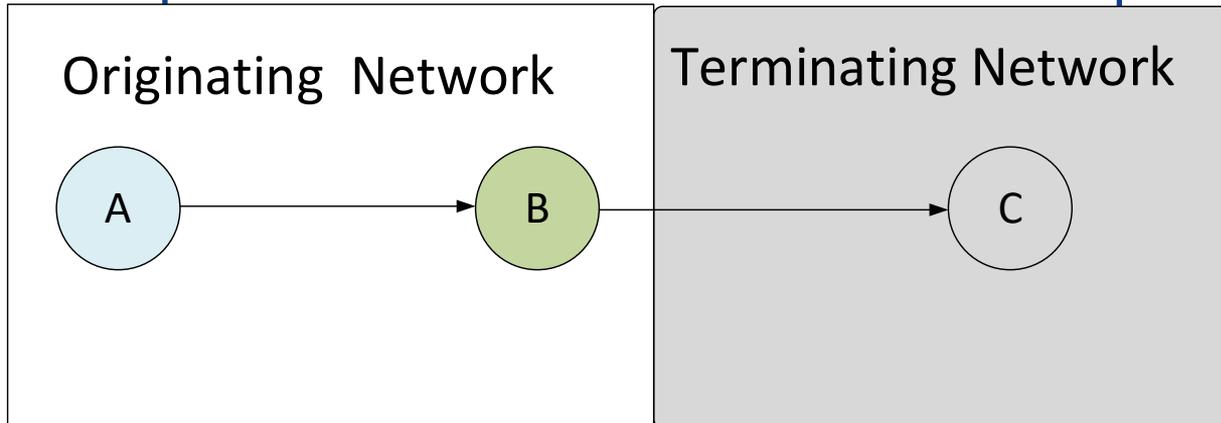


Scenario 3

Originating end

A (target) calls B (target) redirected to C

Intra-CSP sessions are signed/verified

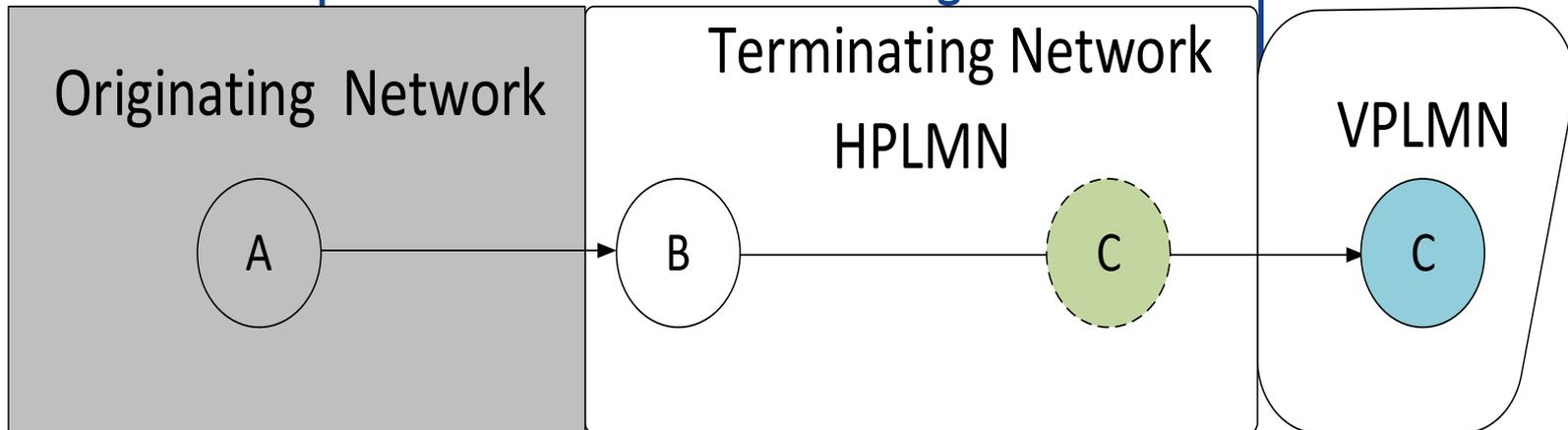


Scenario 4

Terminating end

A calls B redirected to C (target)

Intra-CSP sessions are not signed/verified

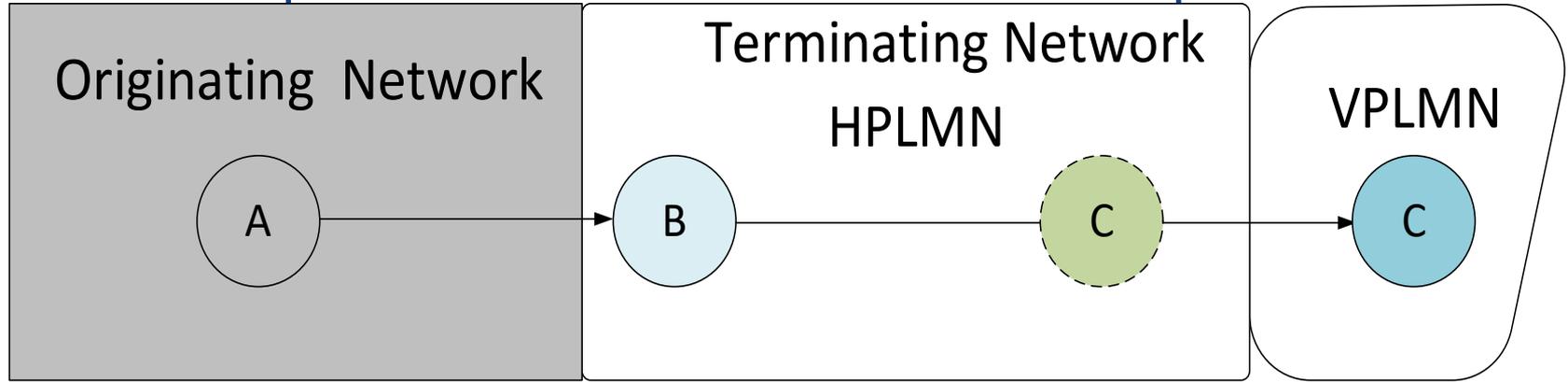


Scenario 5

Terminating end

A calls B (target) redirected to C (target)

Intra-CSP sessions are not signed/verified

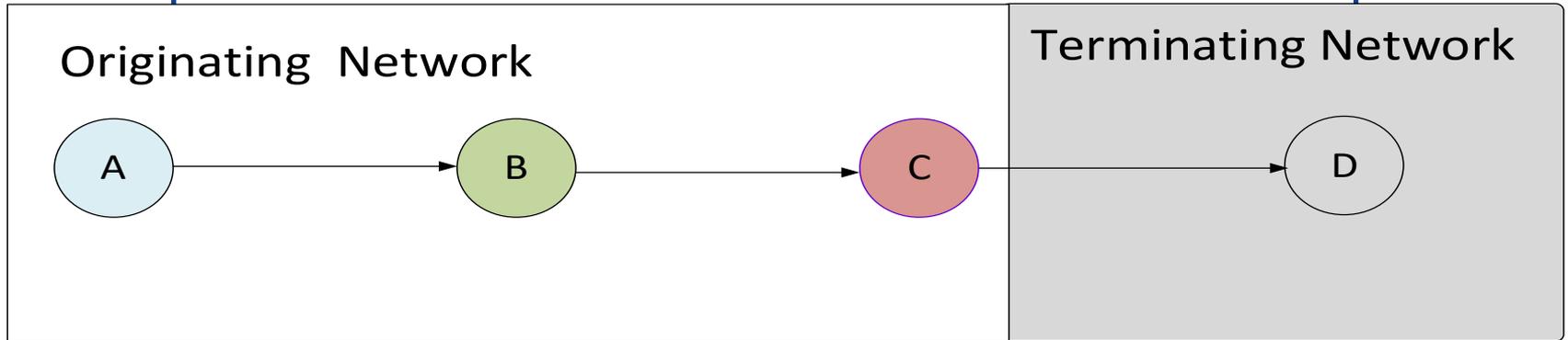


Scenario 6

Originating end

A (target) calls B (target) redirected to C (target) redirected to D

Intra-CSP sessions are signed/verified



Scenario 7

Originating end

A (target) calls B (target) redirected to C (target) redirected to D

Intra-CSP sessions are not signed/verified

Originating Network

Terminating Network

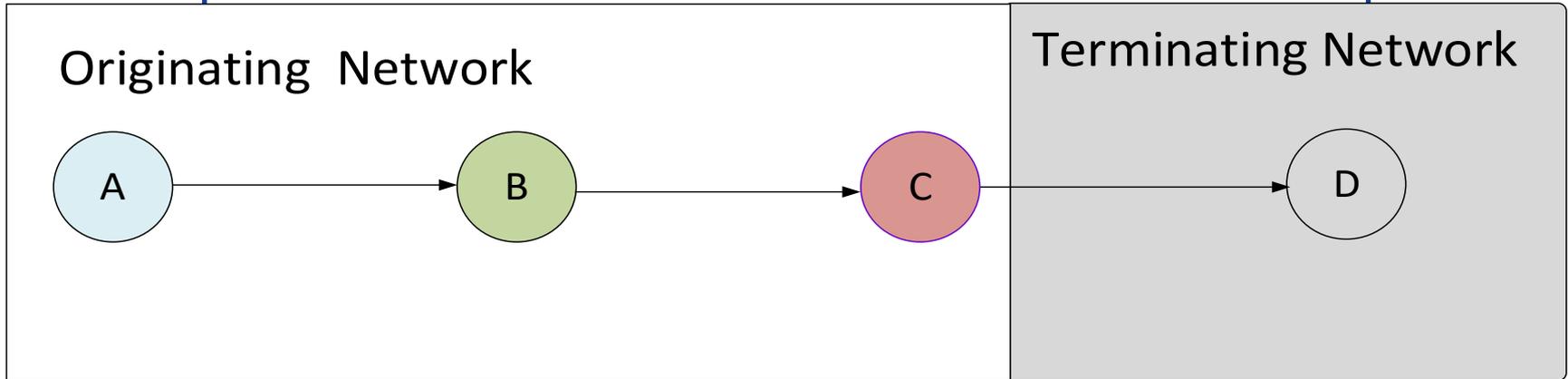


Scenario 8

Originating end

A (target) calls B (target) redirected to C (target) redirected to D

Intra-CSP sessions are not signed/verified

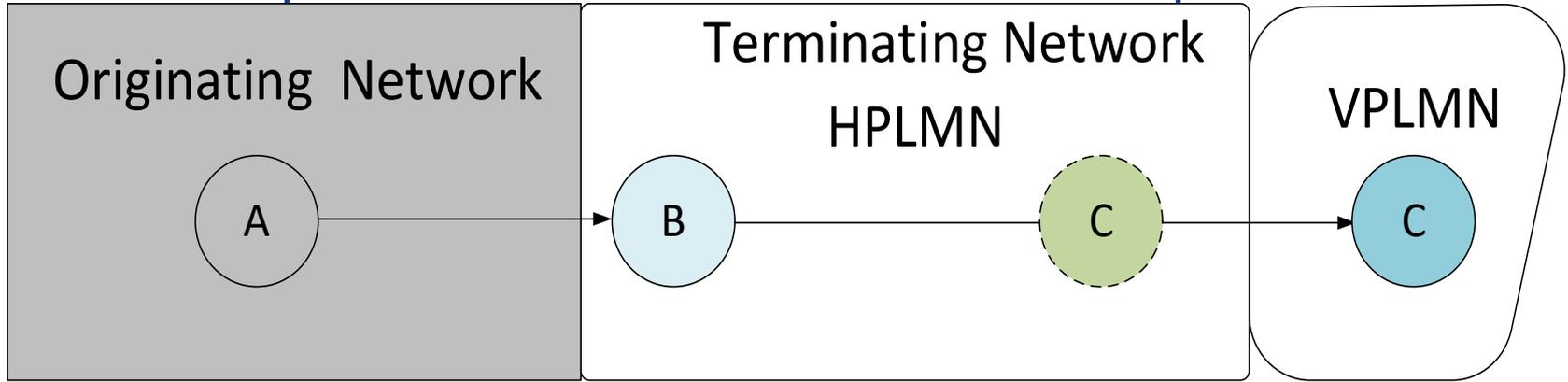


Scenario 9

Terminating end

A calls B (target) redirected to C (target)

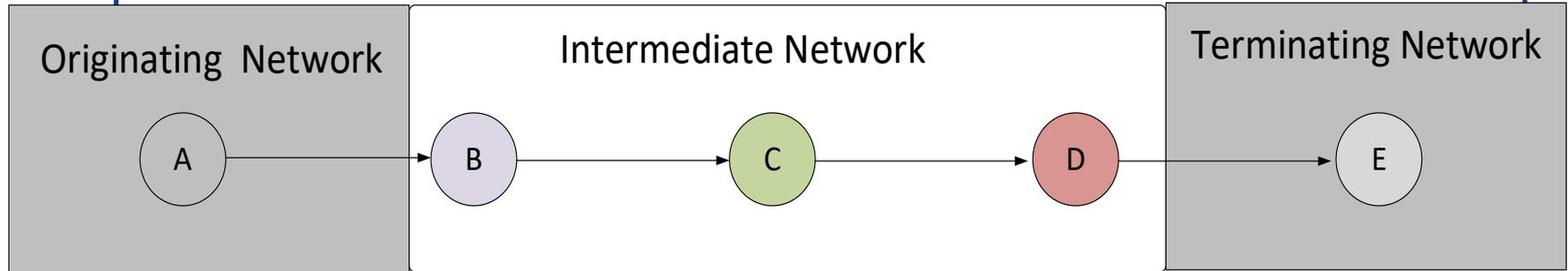
Intra-CSP sessions are signed/verified



Scenario 10

Intermediate Network

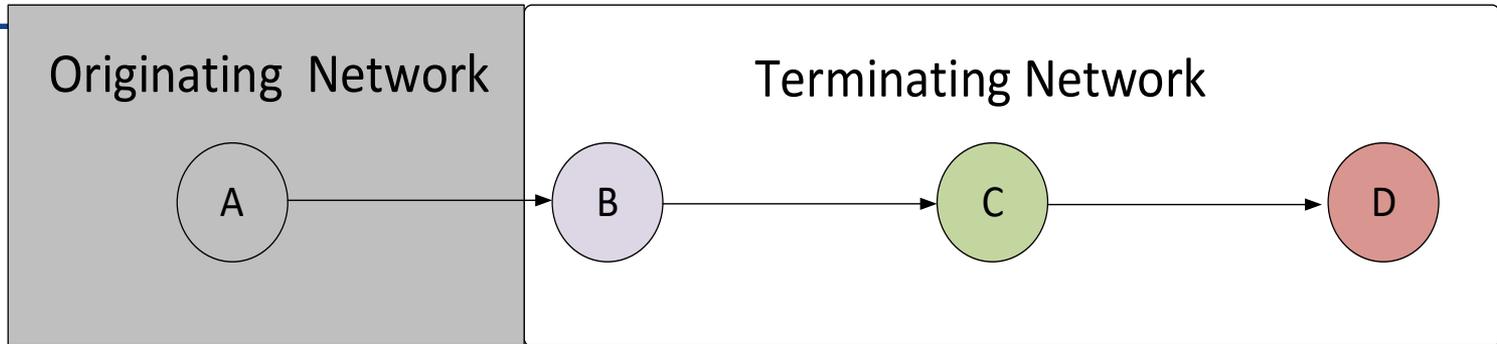
A calls B (target) redirected to C (target) redirected to D (target) redirected to E
Intra-CSP sessions are not signed/verified



Scenario 11

RCD signing

A (with RCD) calls B (target with RCD) redirected to C (target w/o RCD) redirected to D (target) Intra-CSP sessions are not signed/verified

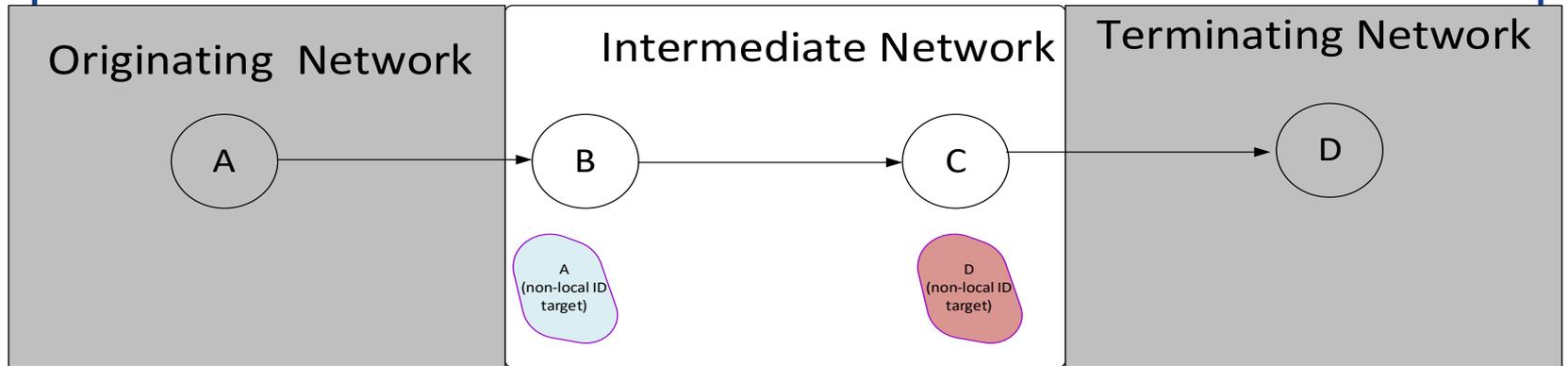


Scenario 12

target non-local ID

A (target non-local ID) calls B redirected to C redirected to D (target non-local ID)

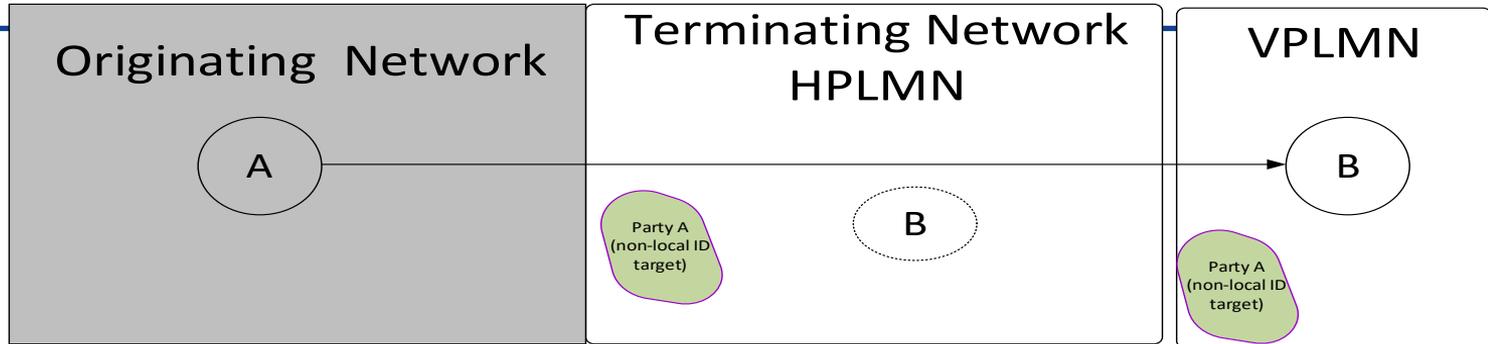
Intra-CSP sessions are signed/verified



Scenario 13

target non-local ID

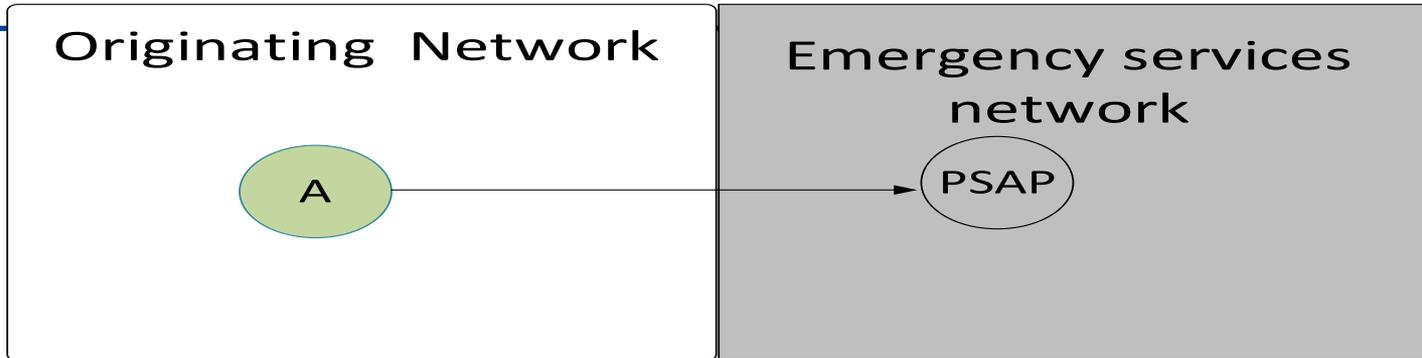
A (target non-local ID) calls B



Scenario 14

Emergency call

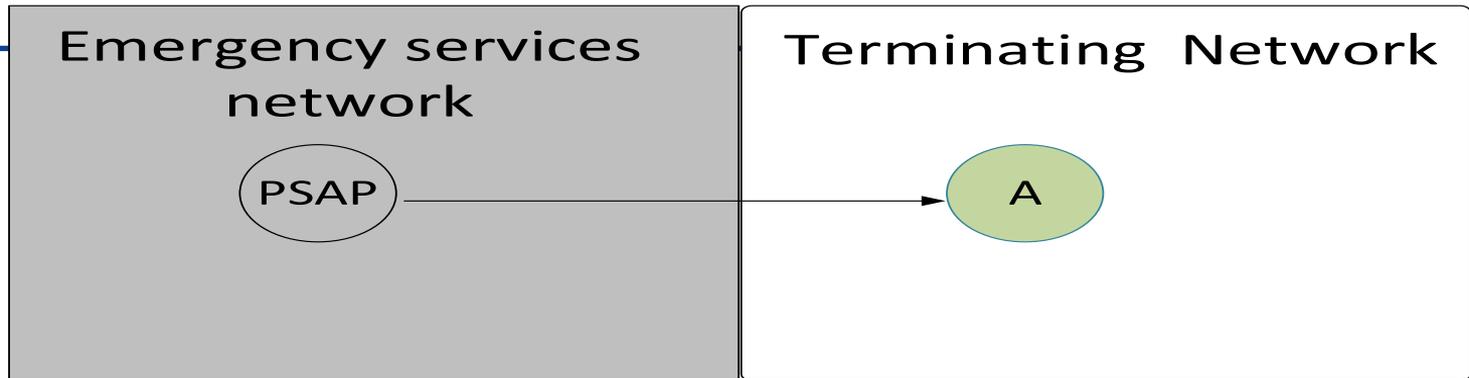
A (target) makes an emergency call



Scenario 15

Emergency callback

Emergency center (PSAP) calls back A (target)



NOKIA