**3GPP TSG-SA3 Meeting #101e S3-202979**

**e-meeting, 9 – 20 November 2020 Revision of S3-20xxxx**

**Source: Huawei, HiSilicon**

**Title: Align the UP IP determinte with 5GS**

**Document for: Approval**

**Agenda Item: 5.3**

# 1 Decision/action requested

***Approve this contribution to add a solution in TR33.853***

# 2 References

[1]

# 3 Rationale

Current wording in solution #11 defineds the MME determine the UP IP from the UP security policy. MME cannot see the BEARER information and does not know the status of RAN, so we propose to change it to RAN determine the UP IP from the UP security policy, which also aligns with 5GS.

# 4 Detailed proposal

pCR

\*\*\* BEGINNING OF CHANGES \*\*\*

## 6.11 Solution #11: Support of UP IP in EPS

### 6.11.1 Introduction

This solution addresses key issue #1 (UP integrity activation in EPS). A UE which has been upgraded to support UP IP over LTE access, when connected to EPS, needs to indicate UE support of UP IP to the network.

This solution impacts the UE, the MME, the HSS and the LTE eNB.

### 6.11.2 Network options affected

This solution is applicable to the following network options:

- Option 1 - eUTRA with EPC

- Option 3 - EPC based Dual Connectivity of eUTRA and NR RAT

### 6.11.3 Solution Description

The UE capability to support UP IP over LTE access when connected to EPS could be indicated in Attach Request and Tracking Area Update Request message. A new IE could be included in the Attach Request message and Tracking Area Update Request message. The new IE would need to be mapped on the S1 interface to the LTE eNB.

A new IE would be protected by the Hash mechanism described in TS 33.401 [xx] in order to detect bidding down attacks. If the new IE included in a Attach/TAU Request messages is not integrity protected or if the integrity check is not successfully in the MME, then the MME would calculate a HASHMME of the entire plain Request message and include the HASHMME in the integrity protected NAS security mode command message to the UE. The UE would calculate a HASHUE from the entire plain Attach Request or TAU Request that it sent and compare the HASHUE with the received HASHMME.

An alternative solution could be to indicate the UE capability to support UP IP in the PDN connection establishment request message. This message would be protected by the regular NAS security established between the UE and the MME.

The transfer of the new IE would also have impact on S10 interface between MME's. For coexistence with legacy nodes then support needs to be signalled by the UE again during mobility procedures at MME change, but this should not be a problem as the UE would initiate a new Tracking Area Update procedure at MME change anyway. Also, it is not envisioned that the LTE eNB would be upgraded, without upgrading the MME as well.

The MME could apply/request use of UP IP at PDN Connection establishment (on par with 5GS). UP IP would then be applied per PDN connection lifetime.

The MME could configure a security policy for UP IP i.e. a UP IP policy, per APN and/or the MME could obtain the UP IP policy by potentially retrieving a UP IP policy for the subscription stored in the HSS or from the locally configured UP IP policy. The obtained UP IP policy would be configured per UE. The UP IP policy could use similar setting options as in 5GS: "required", "preferred", "not needed".

The MME provides the obtained UP IP policy per UE to the LTE eNB on the S1 interface.

When the MME is mapping an EPS bearer to an E-RAB on the S1 interface, the MME would need to repeat the UP IP policy on the S1 interface for each EPS bearer established for the same PDN connection.The UP IP policy could be extended to a UP security policy which includes a security policy for UP encryption as well. This would harmonize the feature over both systems (EPS and 5GS).

The eNB determines whether it can comply with the UP IP policy received from the MME i.e. if there is enough resources to enable or disable UP IP. If UP IP policy is set to REQUIRED or NOT NEEDED, then the eNB cannot overrule the policy similar as in 5GS.If the UP IP policy is set to PREFERRED, the eNB determines whether to enable or disable UP IP. The enabling/disabling of UP IP for DRB's is done using AS SMC procedure and/or RRC Reconfiguration procedure, similar as in NR.

\*\*\*END OF CHANGES\*\*\*