**3GPP TSG-SA WG2 Meeting #163S2-240xxx**

**Jeju, Korea, May 27 – May 31, 2024**

**Source: Samsung, Sateliot, NOVAMINT, DISH Network, EchoStar, Inmarsat, Viasat, Intel**

**Title: KI#2: Conclusions.**

**Document for: Approval**

**Agenda Item: 19.1**

**Work Item / Release: FS\_5GSAT\_ARCH\_Ph3 / Rel-19**

*Abstract of the contribution: This contribution proposes conclusions for KI#2.*

# 1 Discussion

This paper proposes conclusion principles to support the important evaluation criteria as agreed in clause 7.

# 2 Proposal

It is proposed to agree below proposed changes to 23.700-29.

\*\*\* Next Change \*\*\*

# 8 Conclusions

## 8.2 KI #2: Conclusions for Support of Store and Forward Satellite operation

Editor's note: This clause will list conclusions for KI#2.

### 8.2.1 Principles of conclusion

The following conclusions apply to the split MME option:

MME functionality is split into two parts: MME-onboard - the MME part which is onboard the satellite and MME-ground – the MME part which is on the ground network with an interface out of scope of 3GPP.

1) When feeder link is not available and the network supports S&F operation, the network shall be able to inform UE(s) whether S&F Satellite operation is applied, (e.g. eNB broadcast support of S&F operation as part of System Information).

NOTE 1: The trigger for the eNB to broadcast support of S&F operation is based on the decision of RAN WGs. From system perspective the expectation is that if the network does not support S&F operation and the feeder link is not available then eNB switches off and does not broadcast any signal.

2) The UE initiates Attach or TAU procedure, indicates support for S&F mode to the MME following existingNAS capability, the MME-onboard sends Attach or TAU Reject message to the UE. The Attach or TAU Reject message includes:

a) A new informs the UE that the attach or TAU procedure cannot be completed because of the S&F operation and that the UE can re-attempt the attach or TAU in this PLMN in a next satellite pass. This indicates to the UE that the information contained in the Attach or TAU Request message is stored by the MME-onboard and the network will be available to the UE after authentication and subscription details are fetched by the MME-onboard from ground network.

b) Wait timer: Indicates to the UE the time it should wait before re-attempting the Attach procedure in the current or another satellite of the same PLMN. The UE shall not select any other network which will provide store and forward service to the UE till the wait timer is running.

c) The list of Satellite IDs over which the UE can re-attempt the Attach procedure, after wait timer expires. The Satellite IDs are based on the Satellite IDs available in SIB3 and SIB32.

3) How the UE process this information is up to UE implementation and during the wait timer the UE can search for another terrestrial or satellite PLMN to get service.

NOTE 3: The security issues (if any) of this solution are in the scope of SA3.

4) MME-ground indicates to HSS the "Request Time", allowing the HSS to check that no other (e.g., terrestrial) MME has sent an Update Location Request after the "Request Time", and fetches the authentication vector and other details from HSS following current Authentication and security procedures. The MME-ground triggers Update location with the HSS and Update location ACK is received by MME-ground. i.e. all the subscription details are retrieved by MME-ground. The Update Location Request includes an indication that this location update is provisional i.e. the HSS must not consider the UE as registered until it receives the final Update Location Request.

5) When the wait timer has expired given to the UE in step 2,if the UE has not successfully attached to another PLMN and the UE finds the cell which broadcast the Satellite ID valid to re-attempt the attach procedure, the UE re-sends the Attach or TAU Request message.

6) MME-onboard is expected to execute the authentication, and attempts to execute the remaining steps to complete the Attach or TAU procedure with the UE.

Optionally for MO SMS, upon reception of the MO SMS the MME-onboard may store the MO-SMS and immediately sends the delivery report to the UE i.e. as if the MO-SMS has already been successfully delivered to the Service Centre (SC).