**3GPP TSG-WG SA2 Meeting #163 *S2-2407162***

**Jeju, KR, May 27th – 31st, 2024 (revision of S2-2406554, 6902)**

**Source: Huawei, HiSilicon**

**Title: KI#2 Conclusion: For Support of Store and Forward**

**Document for: Approval**

**Agenda Item: 19.1**

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

*Abstract: Conclusion for KI#2.*

# 1. Introduction

Based on the evaluation in S2-2406553, this pCR provides a conclusion for KI#2.

# 2. Text Proposal

It is proposed to capture the following changes vs. TR 23.700-29.

\* \* \* \* First change (all new) \* \* \* \*

## 8.2 Conclusion for KI#2 Store and Forward

NOTE 1: Whether to have a full CN onboard the satellite or Split MME architecture is up the operation deployment.

NOTE 2: The security issues (if any) of these conclusions are in the scope of SA3.

NOTE 3: The LI issues (if any) of these conclusions are in the scope SA3-LI.

NOTE 4: The deployments are subject to regulatory requirements.

The following option is agreed for supporting Store and Forward operation with a full CN onboard the satellite with the following (informative) principles:

- The whole CN including eNB, MME, SGW, PGW, HSS, E-SMLC etc are on board each satellite. Proxies are deployed on the satellite and the ground for application traffic, including support of MT traffic, MO traffic, SMS, etc..

- The implementation of the proxies and the interface between them is out of 3GPP scope.

- The UE attaches, transfers data (e.g. SMS, MO and MT data etc) and detaches from each satellite as required and determined by the monitoring list.

NOTE 5: MT traffic is delivered to the UE after it performs an ATTACH.

- The MT data to a UE is stored in the ground proxy transferred to a proxy onboard the satellite and MT traffic is stored on the satellite proxy and transferred to the ground when the feeder link is available. All types of data traffic (e.g. IP etc) can be supported and transferred using the existing user plane and control plane procedures defined in EPS.

NOTE 6: After mobility from S&F operation, MT traffic could be stuck in the ground proxy and will only be retrieved once the UE goes back to S&F operation.

 For MT traffic, the UE attaches to a satellite and to allow delivery of MO traffic from the user or applications on the UE. A UE, based on implementation, could first wait for an indication from the user or from an application on the UE of pending MT traffic or could wait based on knowledge of when MT traffic may arrive, before performing the attach.

- Depending on the deployment and implementation (i.e. outside the scope of 3GPP in this release), the HSS on a satellite may be populated with subscription data either for only the UEs that may access satellite or all UEs that may access the satellite . The implementation specific synchronisation of subscription data to/from an HSS time stamping of the UE location maybe required to ensure the latest UE location is always known (e.g. to ensure that the latest location is not overwritten when a satellite obtains a feeder link and when the UE attached to the satellite was earlier).

- Depending on the deployment, the UE may have a USIM enhanced for IOPS, or a USIM dedicated to the satellite network.

NOTE 7: The solution does not support the roaming architectures defined in TS 23.501 [2] or TS 23.401 [5].

With the following normative impacts:

- The UE and the MME negotiate a S&F monitoring list of satellites IDs, during attach/TAU. The UE uses the satellites in the S&F monitoring list for MO/MT data/signalling with the CN. The S&F monitoring list can be determination by the CN. How network determines the S&F monitoring list is out side the scope of 3GPP in this release of specification.

- The UE needs to be aware that a satellite supports S&F mode.

NOTE 8: How the UE is aware that a satellite supports S&F mode of operation depends on RAN.

- A UE may be rejected if the satellite cannot support the UE at this time. The attach reject may provide a timer for the time the UE should wait before reattempting and S&F monitoring list which the UE can attempt attach again.

\* \* \* \* End of changes \* \* \* \*