**3GPP TSG SA WG5 Meeting #158 S5-246770**

**Orlando, USA, 18– 22 November, 2024**

**Source: CATT**

**Title: Add store and forward satellite operation charging solutions for User Plane CIoT**

**Document for: Approval**

**Agenda Item: 7.5.1**

# 1 Decision

***The group is asked to discuss and agree on the proposal.***

# 2 References

[1] 3GPP TR 28.846: " Study on charging aspects of satellite access Phase 3 ".

# 3 Rationale

According to the conclusion of the SA2 SAT\_Ph3\_ARCH, the feature of S&F operation only supports the EPC in the Rel-19. Only delay-tolerant/non-real-time satellite services (i.e. CIoT/MTC, SMS) have been supported in the Rel-19.

This pCR proposes to add S&F operation charging solutions for User Plane CIoT.

As the approved CR of SA2 for the S&F operation, only the whole EPC on-board architecture support using the User Plane CIoT EPS optimisation to transfer data.Moreover, the UE using satellite access with S&F operation indication in the initial attach or the service request procedure can only be known by MME. The P-GW can not get the information about the S&F. Therefore, this solution proposes to use MME to trigger to charge the S&F operation of the User Plane CIoT service.

# 4 Detailed proposal

The following changes are proposed to be incorporated into the new TR.

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| **1st Modified Section** |

#### 6.1.4.x Solution #1.x: MME Charging Trigger Function (CTF) based solution for S&F operation charging with User Plane CIoT

This solution which relying on EPC offline Charging System for store and forward satellite operation charging, addresses the Key Issue#1.1 and Key Issue#1.2.

As approved CR (S2-2410990,S2-2410991)of SA2, only the whole EPC on-board architecture support using the User Plane CIoT EPS optimisation to transfer data.

Since UE using satellite access with S&F operation indication in the initial attach or the service request procedure can only be known by MME, only offline charging triggered by MME can be used to charge the S&F operation of the User Plane CIoT service. For the whole EPC on-board architecture, the CTF may be deployed on the satellite. The high level of the whole EPC on-board architecture is the same as the Figure 6.1.4.1-2 of the solution#1.2.

The MME on-board reports charging information to OFCS about satellite access running in S&F mode with the following trigger events:

- Attach Complete via the MME onboard for the CIoT UP Optimizations;

- Service Request via the MME onboard for the CIoT UP Optimizations.

The charging solution is similar with the solution#1.2 except for all the devices are on the satellite.

Since the MME cannot obtain the store duration and store data volume, the charging information would be:

- RAT type extends to include "WB-E-UTRAN(LEO)", "WB-E-UTRAN(MEO)", " WB-E-UTRAN(GEO)", " WB-E-UTRAN(OTHERSAT)", "NB-IoT(LEO)", "NB-IoT(MEO)", "NB-IoT(GEO)", "NB-IoT(OTHERSAT)", "LTE-M(LEO)", "LTE-M(MEO)", "LTE-M(GEO)" and "LTE-M(OTHERSAT)"

- Satellite information

- Store and Forward indicator- S&F Monitoring list (i.e.Satellite IDs)

- Satellite Access Indicator

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| **End of Modified Sections** |