**3GPP TSG SA WG5 Meeting #155 S5-242900**

**Jeju, South Korea, 27 - 31 May 2024**

**Source: CATT**

**Title: Discussion paper on the background for FS\_5GSAT\_Ph3\_CH**

**Document for: Endorsement**

**Agenda Item: 7.5.1**

# 1 Decision/action requested

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

# 2 References

[1] S5- 241830 “New Study on charging aspects of satellite access Phase 3”

[2] S5-241873 “Discussion paper on charging aspects of satellite aceess Phase 3”

# 3 Rationale

This discussion paper proposes to add Background for the study on charging aspects of satellite access Phase 3 which is initiated by S5- 241830 [1].

# 4 Detailed proposal

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

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| **1st Modified Section** |

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 22.261: "Service requirements for next generation new services and markets; Stage 1".

[3] 3GPP TR 22.844: "Study on charging aspects of satellite in the 5G System"

[4] 3GPP TR 23.700-29: "Study on integration of satellite components in the 5G architecture; Phase 3"

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| **2nd Modified Section** |

# 4 Background

## 4.1 General

For Rel-19, SA1 has specified the following requirements on charging aspects for satellite access Phase 3 in the TS 22.261[2]:

* A 5G system with satellite access supporting Store and Forward (S&F) Satellite operation shall be able to collect charging information per UE or per application (e.g., number of UEs, data volume, duration, involved satellites).
* A 5G system with satellite access shall be able to collect charging information for a UE registered to a HPLMN or a VPLMN, for UE-Satellite-UE communication.
* In a 5G system with satellite access, charging data records associated with satellite access(es) shall include the location of the associated UE(s) with satellite access.

## 4.2 Regenerative-based satellite access

As introduced in the clause 4.5 of TR 28.844[3], the regenerative-based satellite access architecture involves deploying some 5GC network functions on the satellites. The following from figure 6.2.1-1 of TR 23.700-29[4] shows the high-level 5G network architecture for the regenerative-based satellite access.



Figure 4.2-1: Regenerative-based satellite access

## 4.3 Store and Forward Satellite operation

As specified in the TS 22.261[2], the new capability that Store and Forward Satellite operation is an operation mode of a 5G system with satellite-access, allows the satellite to store and forward data when satellite connectivity is intermittently/temporarily unavailable(e.g. when the satellite is not connected via a feeder link or via ISL to the ground network). The following from Figure J-1 of TS 22.261[2] shows the high-level network architecture for Store and Forward Satellite operation.



Figure 4.3-1: Illustration of "S&F Satellite operation" modes in a 5G system with satellite access

Editor's note: SA5 will align with the architecture and procedure for supporting store and forward operation specified by SA2.

## 4.4 UEs- SAT- UEs communications on satellite

As specified in the TS 22.261[2], a 5G system with satellite access shall support UE-Satellite-UE communication regardless of whether the feeder link is available or not. The UE-satellite-UE communication scenario is that UEs can communicate using satellite access without the user plane traffic going to the ground network. The following from Figure 6.28.1-1 of TR 23.700-29[4] shows the high-level network architecture for UE-satellite-UE communication.



Figure 4.a-1: UEs- SAT- UEs communications on satellite in same cell with ISL

Editor's note: SA5 will align with the architecture and procedure for supporting UEs- SAT- UEs communications specified by SA2.

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| **End of Modified Sections** |