**3GPP TSG-SA5 Meeting #154 *S5-*** ***241779***

**Changsha, CHINA, 15 Apr - 19 Apr 2024** **(revision of xx-yyxxxx)**

**Source: CATT, CSCN**

**Title: New Study on charging aspects of satellite access Phase 3**

**Document for: Approval**

**Agenda Item: 7.5**

3GPP™ Work Item Description

Information on Work Items can be found at <http://www.3gpp.org/Work-Items>   
See also the [3GPP Working Procedures](http://www.3gpp.org/specifications-groups/working-procedures), article 39 and the TSG Working Methods in [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm)

Title: Study on charging aspects of satellite access Phase 3

Acronym: FS\_5GSAT\_CH\_Ph3

Unique identifier:

Potential target Release: Rel-19

# 1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Affects: | UICC apps | ME | AN | CN | Others (specify) |
| Yes |  |  |  | X |  |
| No | X | X | X |  |  |
| Don't know |  |  |  |  | X |

# 2 Classification of the Work Item and linked work items

## 2.1 Primary classification

### This work item is a …

|  |  |
| --- | --- |
| X | Study |
|  | Normative – Stage 1 |
|  | Normative – Stage 2 |
|  | Normative – Stage 3 |
|  | Normative – Other\* |

**\* Other = e.g. testing**

## 2.2 Parent Work Item

For a brand-new topic, use “N/A” in the table below. Otherwise indicate the parent Work Item.

|  |  |  |  |
| --- | --- | --- | --- |
| Parent Work / Study Items | | | |
| Acronym | Working Group | Unique ID | Title (as in 3GPP Work Plan) |
|  |  |  |  |

### 2.3 Other related Work Items and dependencies

|  |  |  |
| --- | --- | --- |
| Other related Work /Study Items (if any) | | |
| Unique ID | Title | Nature of relationship |
| 1000024 | Stage 1 of Satellite access Phase 3 | Defines new services requirements for R19 |
| 1010033 | Study on Integration of satellite components in the 5G architecture Phase 3 | SA2 Rel-19 SID for 5G System enhancement with the integration of satellite |
| 1010018 | Charging aspects of 5GSAT | SA5 Rel-18 WID for satellite access charging |
| 800040 | Charging for IMS over 5G System Architecture Phase 1 | SA5 Rel-18 WID for IMS charging |

**Dependency on non-3GPP (draft) specification:** **None**

# 3 Justification

This study item aims at studying charging aspects for satellite access for Rel-19. In SA1 Rel-19, The following requirements on charging aspects for satellite access have been specified by SA1 in TS 22.261:

- 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.

The 3GPP SA2 is studying the following three key issues in TR 23.700-29[2]:

* Key Issue #1: Support of Regenerative-based satellite access
* Key Issue #2: Support of Store and Forward Satellite operation
* Key Issue #3: Support of UE-satellite-UE communication

For the regenerative-based satellite access, due to the gNB being considered deployed on the satellite in the Rel-19, new RAT types may be defined. Furthermore, due to the movement of the satellite gNB, the mobility charging may need to be studied.

For the store and forward satellite operation scenario, the charging solutions for how much and how long the data of the UE stored in the satellite 5GC needs to be studied. The charging information per UE or per application (e.g., number of UEs, data volume, duration, involved satellites) also needs to be studied.

For the UE-satellite-UE communication related to IMS voice scenario, the charging information for a UE registered to a HPLMN or a VPLMN, for UE-Satellite-UE communication needs to be studied.

Since gNB and a necessary set of CN 3GPP functions are being considered deployed on the satellite, the operators may rent the satellite to deploy them. Satellite infrastructure resource usage and gNB/ CN deployment charging are similar to the charging scenarios for the edge enabling infrastructure resource usage and EAS deployment in the edge computing charging of TS 32.257 and needs to be studied.

Therefore, there can be a number of charging scenarios in satellite charging aspect as following:

* End user charging when gNB deployed on the satellite
* Charging for store and forward satellite operation related to delay-tolerant communication services
* Charging for UE-satellite-UE communication related to IMS voice
* Satellite infrastructure resource usage/ gNB and CN deployment charging

The enhancement to the charging aspect of satellite access phase 3 in 5GS needs to be studied.

# 4 Objective

This study item is to investigate the following aspects for the satellite access in 5GS phase 3:

* Possible business scenarios;
* Possible charging scenarios and potential charging requirements, including but not limited to:
  + End user charging when gNB deployed on the satellite
  + Store and forward satellite operation charging
  + UE-satellite-UE communication charging
  + Satellite infrastructure resource usage/gNB and CN deployment charging
* Identify the potential charging solutions.

Note： The charging work will keep alignment with SA2 conclusions.

## TU estimates and dependencies

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Work Task ID** | **TU Estimate**  **(Study)** | **TU Estimate**  **(Normative)** | **RAN Dependency**  **(Yes/No/Maybe)** | **SA Dependency**  **(Yes/No/Maybe)** | **Non-3GPP Dependency** |
| WT-1 | 0.5 | 0.5 | No | Maybe | No |
| WT-2 | 0.5 | 0.5 | No | Yes | No |
| WT-3 | 2 | 2 | No | Yes | No |

**Total TU estimates for the study phase: 3**

**Total TU estimates for the normative phase: 3**

**Total TU estimates: 6**

# 5 Expected Output and Time scale

***{If this WID covers both stage 2 and stage 3, clearly indicate the different completion dates.}***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| New specifications {One line per specification. Create/delete lines as needed} | | | | | |
| Type | TS/TR number | Title | For info  at TSG# | For approval at TSG# | Rapporteur |
| TR | TR 28.xxxx | Study on charging aspects of satellite access Phase 3 | TSG SA#106 | TSG SA#107 |  |
|  |  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Impacted existing TS/TR {One line per specification. Create/delete lines as needed} | | | |
| TS/TR No. | Description of change | Target completion plenary# | Remarks |
|  |  |  |  |
|  |  |  |  |

# 6 Work item Rapporteur(s)

# 7 Work item leadership

SA5

# 8 Aspects that involve other WGs

None

# 9 Supporting Individual Members

|  |
| --- |
| Supporting IM name |
| CATT |
| MATRIXX Software |
| CSCN |
|  |
|  |
|  |