**3GPP TSG-CT WG1 Meeting #150C1-244497**

**Maastricht, NL, 19 – 23 August 2024**

**Source: CATT**

**Title: New WID on CT aspects of integration of satellite components in the 5G architecture Phase 3**

**Document for: Approval**

**Agenda Item: 19.1.1**

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: CT aspects of integration of satellite components in the 5G architecture Phase 3

Acronym: 5GSAT\_Ph3\_ARCH

Unique identifier: to be assigned

Potential target Release: Rel-19

# 1 Impacts

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

# 2 Classification of the Work Item and linked work items

## 2.1 Primary classification

### This work item is a …

|  |  |
| --- | --- |
|  | Study  |
|  | Normative – Stage 1 |
| X | Normative – Stage 2 |
| X | 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) |
| 5GSAT\_Ph3\_ARCH | SA2 | 1040027 | New WID on Integration of satellite components in the 5G architecture Phase 3 |

## 2.3 Other related Work Items and dependencies

|  |
| --- |
| Other related Work Items (if any) |
| Unique ID | Title | Nature of relationship |
| 80048 | Stage 1 of 5GSAT | Service requirements of satellite access in 5G |
| 960016 | Stage 1 of 5GSAT: FS\_5GSAT\_Ph3Study on satellite access - Phase 3 | Defines new services requirements for R19  |
| 940074 | 5GC enhancement for satellite access Phase 2 | SA2 Rel-18 SID for 5G System enhancement for satellite access |
| 980014 | 5GC/EPC enhancement for satellite access Phase 2 | SA2 Rel-18 WID for 5G System enhancement for satellite access |
| 940060 | Study on 5G System with Satellite Backhaul | SA2 Rel-18 SID for 5G System with Satellite Backhaul |
| 970018 | 5G System with Satellite Backhaul | SA2 Rel-18 WID for 5G System with Satellite Backhaul |
| 1010033 | Study on Integration of satellite components in the 5G architecture Phase III | SA2 Rel-19 SID |
| 1020044 | Study on Security Aspects of 5G Satellite Access | SA3 Rel-19 SID |

# 3 Justification

Integration of satellite components in the 5G architecture Phase 3 is a Rel-19 SA WGs work item which impacts the CT WGs. The SA2 WG has studied Key Issue 1 “Support of Regenerative-based satellite access”, Key Issue 2 “Support of Store and Forward Satellite operation” and Key Issue 3 “Support of UE-satellite-UE communication” in Study on Integration of satellite components in the 5G architecture Phase III (unique ID 1010033) with results and conclusions documented in TR 23.700-29 which also provides guidance on required normative work.

In SA#104 in June 2024, SA agreed on a normative Rel-19 WID on integration of satellite components in the 5G architecture Phase 3 ([SP-240986](https://www.3gpp.org/ftp/tsg_sa/TSG_SA/TSGS_104_Shanghai_2024-06/Docs/SP-240986.zip)), which includes the conclusions for Key Issue 2 "Support of Store and Forward satellite operation" and Key Issue 3 "Support of UE-Satellite-UE communication".

Therefore, it is necessary for a new CT work item to implement the stage-2 requirements and address the stage 3 protocol enhancement for support of integration of satellite components in the 5G architecture Phase 3.

# 4 Objective

The objective of this work is to specify the CT aspects of integration of satellite components in the 5G architecture Phase 3 in order to enhance the CT WGs specifications based on the stage-2 requirements. Normative work to be developed by SA WGs and RAN WGs which may impact CT WGs will be considered as soon as those are available.

The following areas of work are expected to be covered:

CT1:

For supporting Store and Forward satellite operation in EPS:

a) update to the NAS procedures to support S&F operation including:

1) UE indication of support for S&F operation;

2) new EMM cause(s) in attach reject or TAU reject message;

3) the timers and satellite list provided by the MME; and

4) potentially estimated delivery time provided by the MME.

b) update to the short message services.

c) potential update to the AT commands.

NOTE 1: In release 19 roaming is not supported in the full CN onboard architecture.

For supporting UE-Satellite-UE communication in 5GS:

a) potential update to the AGW (re-)selection procedure due to UE-SAT-UE communication.

NOTE 2: In release 19 roaming is not supported and the two UEs engaged in an IMS communication belong to the PLMN providing access via satellite link.

NOTE 3: CT1 will align its specifications once the architecture and the procedures for UE-Satellite-UE communication have been determined by SA2.

CT3:

For supporting of Store and Forward satellite operation in EPS:

a) update to the SCEF northbound API (e.g., MonitoringEvent API) at T8 reference point to expose S&F information to SCS/AS.

For supporting of UE-Satellite-UE communication in 5GS:

a) potential update to PCF services and Rx/N5 interface to support UE-SAT-UE communication.

CT4:

For supporting of Store and Forward satellite operation in EPS:

a) update to T6a, T7 and S6t interfaces to support the exposure of S&F information.

b) update to the S6a interface to support new parameters (e.g., Request Time) for S&F operation.

For supporting of UE-Satellite-UE communication in 5GS:

a) potential update to the NRF services for UPF selection for UE-SAT-UE communication.

b) potential update to the SMF service and N4 interface to support UE-SAT-UE communication.

# 5 Expected Output and Time scale

|  |
| --- |
| 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 |
|  |  |  |  |  |  |

|  |
| --- |
| Impacted existing TS/TR {One line per specification. Create/delete lines as needed} |
| TS/TR No. | Description of change  | Target completion plenary# | Remarks |
| TS 24.301 | Update to the NAS procedures to support S&F operation. | TSG CT#109(September 2025) | CT1 |
| TS 23.040 | Update to the short message services. | TSG CT#109(September 2025) | CT1 |
| TS 27.007 | Potential update to AT commands. | TSG CT#109(September 2025) | CT1 |
| TS 24.229 | Update to the IMS procedures and functions for supporting of UE-Satellite-UE communication. | TSG CT#109(September 2025) | CT1 |
| TS 29.122 | Update to support the exposure S&F information to SCS/AS. | TSG CT#109(September 2025) | CT3 |
| TS 29.214 | Potential update to support UE-SAT-UE communication. | TSG CT#109(September 2025) | CT3 |
| TS 29.512 | Potential update to support UE-SAT-UE communication. | TSG CT#109(September 2025) | CT3 |
| TS 29.513 | Potential update to PCC call flows.  | TSG CT#109(September 2025) | CT3 |
| TS 29.514 | Potential update to support UE-SAT-UE communication. | TSG CT#109(September 2025) | CT3 |
| TS 29.561 | Potential update to support UE-SAT-UE communication, e.g., UPF tunnel setup. | TSG CT#109(September 2025) | CT3 |
| TS 29.272 | Potential update to support new parameters for S&F operation | TSG CT#109(September 2025) | CT4 |
| TS 29.128 | Potential update to support the exposure of S&F information. | TSG CT#109(September 2025) | CT4 |
| TS 29.336 | Update to support the exposure of S&F information. | TSG CT#109(September 2025) | CT4 |
| TS 29.510 | Potential update for UPF selection for UE-SAT-UE communication | TSG CT#109(September 2025) | CT4 |
| TS 29.502 | Potential update to support UE-SAT-UE communication. | TSG CT#109(September 2025) | CT4 |
| TS 29.244 | Potential update to support UE-SAT-UE communication. | TSG CT#109(September 2025) | CT4 |
| TS 29.571 | Possible common data definition. | TSG CT#109(September 2025) | CT4 |

NOTE: Other impacted existing TS can be identified based on progress in normative work in Stage 2.

# 6 Work item Rapporteur(s)

Zhao, Xiaoxue, CATT, zhaoxiaoxue@cictmobile.com

# 7 Work item leadership

CT1

# 8 Aspects that involve other WGs

SA3/SA3-LI for the security aspects,

RAN for the RAN related issues.

# 9 Supporting Individual Members

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| Supporting IM name |
| CATT |
| Thales |
| SHARP |
| Sateliot |
| LG Electronics |
| Nokia |
| Novamint |
| MediaTek Inc. |
| China Mobile |
| vivo |
| ZTE |
| Qualcomm |
| Intel |
| Google lnc |
| Apple |
| Samsung |
| Xiaomi |