**3GPP TSG-SA WG2 Meeting #164 *S2-2409421***

**Maastricht, NL, August 19-23, 2024 *(revision of S2-2409409)***

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **23.228** | **CR** | **1428** | **rev** | **4** | **Current version:** | **18.6.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Support of UE-Satellite-UE communication in IMS | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | NTT DOCOMO, CATT, Samsung, China Telecom | | | | | | | | | |
| ***Source to TSG:*** | S2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5GSAT\_Ph3\_ARCH | | | | |  | ***Date:*** | | | 2024-08-23 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-19 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | According to the approved 5GSAT\_Ph3\_ARCH work item and the conclusion of FS\_5GSAT\_Ph3\_ARCH captured in clause 8.3 of TR 23.700-29, this CR adds description on Support of UE-Satellite-UE communication in IMS. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Addition of Support of UE-Satellite-UE communication in IMS. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | An objective of the 5GSAT\_Ph3\_ARCH work item is not achieved. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | Annex AX (new) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

---Start of the 1st Change---

Annex AX (normative):  
Support of UE-Satellite-UE communication in IMS

# AX.1 General

This annex describes IMS architecture enhancements to support UE-Satellite-UE communication in IMS, i.e., optimized media routing via IMS user plane on-board satellite.

In this Release of the specification, this feature is supported only for IMS voice/video service and for UEs belonging to the same PLMN and in the non-roaming scenario.

The term and the 5GS architecture for UE-Satellite-UE communication is defined in TS 23.501 [93]. The optimized media routing described in this annex refers to a routing of media between UEs under the coverage of the same or of different serving satellites, using this IP-CAN and with the media not transiting through any network elements on the ground. The ground fallback routing refers to the case with the media transiting through the ground segment.

The P-CSCF is responsible for determining whether to activate UE-satellite-UE communication, that is, whether it is possible to apply media routing that only relies on IMS user plane on-board satellite. P-CSCFs serving the MO UE and the MT UE shall negotiate with each other to determine whether to activate UE-satellite-UE communication.

# AX.2 Architecture and functional entities

## AX.2.1 Architecture

Editor's note: Architecture is FFS.

## AX.2.2 Functional entities

### AX.2.2.1 P-CSCF

The P-CSCF used for this feature is enhanced to support the following functionalities:

- the P-CSCF determines the activation of optimized media routing and interacts with 5GS, as described in Annex AX.3.

- the P-CSCF interacts with IMS AGW, as described in Annex AX.4.

# AX.3 Optimized media routing activation

## AX.3.1 At call setup

The P-CSCF receives from the PCF the identifier of the satellite serving the UE and receives from the P-CSCF serving the remote UE the identifier of the satellite serving the remote UE. The P-CSCF shall use this information to determine whether or not activate optimized media routing.

Editor's note: Whether and how P-CSCF determines activation of optimized media routing based on satellite identifiers is FFS.

Editor's note: Whether and how to take UE subscription aspect into account for this activation is FFS.

If P-CSCF determines the activation of optimized media routing, the P-CSCF shall instruct PCF to authorize the necessary resources as per clause 5.6.2 and clause 5.7.2, so that the PCF proceeds to establish a path for optimized media routing.

## AX.3.2 At change of satellite

The P-CSCF shall determine whether optimized media routing continues to be possible between a satellite that is about to serve the local UE and the satellite serving the remote UE based on the identifiers of those satellites. The P-CSCF obtains the identifier of the new satellite from PCF.

Editor's note: How P-CSCF determines activation of optimized media routing continues based on satellite identifiers is FFS.

If the P-CSCF determines that optimized media routing can continue at change of satellite, the P-CSCF shall send a message to the PCF as defined in TS 23.502 [94] to establish a path on the target satellite for optimized media routing.

If the P-CSCF determines that optimized media routing is no longer possible e.g. due to a change of satellite, the P-CSCF shall execute the ground fallback procedure to reroute the media via the ground.

When the P-CSCF receives from the remote network a SIP message without satellite identifier, the P-CSCF shall determine that optimized media routing is no longer possible and execute the ground fallback procedure to reroute the media via the ground.

# AX.4 Interaction with IMS AGW

## AX.4.1 At call setup

P-CSCF shall select an IMS AGW on ground at call setup according to TS 23.334 [74] and proceeds with the determination of whether UE-Satellite-UE communication is possible. If the P-CSCF determines the activation of optimized media routing is possible, the P-CSCF shall release the IMS AGW on ground when needed and select instead an IMS AGW on satellite according to TS 23.334 [74].

Editor's note: How the SDP re-negotiation is performed to provide media continuity when IMS-AGW changes is FFS

---End of the Change---