**3GPP TSG-SA WG2 Meeting #164 *S2-2409114***

**Maastricht, NL, August 19-23, 2024 *(revision of S2-2408850)***

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  | **23.228** | **CR** | **1428** | **rev** | **2** | **Current version:** | **18.6.0** |  |
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| *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)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

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| ***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:*** | 2024-08-22 |
|  |  |  |  |  |
| ***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 canbe 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)* |
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| ***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. |
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| ***Summary of change:*** | Addition of Support of UE-Satellite-UE communication in IMS. |
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| ***Consequences if not approved:*** | An objective of the 5GSAT\_Ph3\_ARCH work item is not achieved. |
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| ***Clauses affected:*** | Annex AX (new) |
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|  | **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 ...  |
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| ***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.

The 5GS architecture for UE-Satellite-UE communication is defined in TS 23.501 [93]. IP-CAN for it is realized by 5GS with functionalities defined in clause x.x of TS 23.501 [93]. The optimized media routing described in this annex refers to a routing of media between UEs under the coverage of one or more serving satellites, using this IP-CAN without the media transiting through the ground segment. The ground fallback routing refers to the case with the media transiting through the ground segment.

P-CSCFs in the MO side and in the MT side exchange the identifier of a satellite serving the MO UE and the MT UE, respectively, and enable the IP-CAN of the MO side and of the MT side in coordination to provide a media routing path with or without the media transiting through the ground segment. P-CSCF also establish IMS AGW either on ground or on satellite accordingly.

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

# AX.2 Architecture and functional entities

## AX.2.1 Architecture

## AX.2.2 Functional entities

### AX.2.2.1 P-CSCF

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

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

- P-CSCF controls IMS AGW relocation, as described in Annex AX.4.

# AX.3 Optimized media routing activation

## AX.3.1 At call setup

When the P-CSCF receives the identifier of a satellite serving the UE from PCF and finds the identifier of a satellite serving the remote UE in a SIP message received from the remote network, the P-CSCF shall determine the activation of optimized media routing based on those satellite identifiers.

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 activation of optimized media routing, P-CSCF shall send Npcf\_PolicyAuthorization request as per TS 23.502 [94] to PCF, so that the PCF proceeds to establish a path for optimized media routing.

Editor's note: FFS if Npcf\_PolicyAuthorization\_Create request or Npcf\_PolicyAuthorization\_Update request.

## AX.3.2 At change of satellite

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

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

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

Editor's note: A message used by P-CSCF to inform to PCF is defined in 23.501/502/503 CR. FFS.

When P-CSCF receives from the remote network a SIP re-INVITE without satellite identifier, the P-CSCF shall determine that optimized media routing becomes not possible and execute the procedure defined in clause AX.4 to relocate path of the session for ground fallback routing.

If P-CSCF determines that optimized media routing becomes not possible e.g. at change of satellite, P-CSCF shall send a message to PCF, so that the PCF proceeds to establish a path for ground fallback routing.

Editor's note: A message used by P-CSCF to inform to PCF is defined in 23.501/502/503 CR. FFS.

# AX.4 IMS AGW relocation

## AX.4.1 At call setup

P-CSCF shall establish an IMS AGW on ground at call setup according to TS 23.334 [74], as long as the P-CSCF does not determine the activation of optimized media routing. After the P-CSCF determines the activation of optimized media routing, the P-CSCF shall release the IMS AGW on ground and establish an IMS AGW on satellite according to TS 23.334 [74].

---End of the Change---