**3GPP TSG-SA5 Meeting #141-eS5-221127rev1**

**e-meeting, 17 - 26 January 2022**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **32.255** | **CR** | **0363** | **rev** | **1** | **Current version:** | **17.4.0** |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

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| ***Title:*** | Add charging enhancements of 5GS CIoT in home-routed roaming procedure | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei | | | | | | | | | |
| ***Source to TSG:*** | S5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5G\_CIoT\_CH | | | | |  | ***Date:*** | | | 2022-01-07 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | B |  | | | | | ***Release:*** | | | Rel-17 |
|  | *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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
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| ***Reason for change:*** | | This tdoc is to update home-routed roaming procedure related to 5GS CIoT in TS 32.255. | | | | | | | | |
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| ***Summary of change:*** | | This tdoc is to update home-routed roaming procedure related to 5GS CIoT in TS 32.255. | | | | | | | | |
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| ***Consequences if not approved:*** | | The 5GS CIoT related steps and description are not covered in TS 32.255. | | | | | | | | |
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| ***Clauses affected:*** | | 5.2.2.12.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

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| **Start of changes** |

##### 5.2.2.12.2 PDU session establishment

The following figure 5.2.2.12.2.1 describes a PDU session charging establishment in roaming Home routed scenario based on figure 4.3.2.2.2.1 TS 23.502 [201] description:

Figure 5.2.2.12.2.1: PDU session charging: establishment roaming Home Routed

1-3a. UE initiates a new PDU session. V-SMF and H-SMF selection by the AMF.

3ch-a. The UE is identified as a roamer (PLMN ID of the received SUPI is different from VPLMN PLMN ID), the CHF is selected accordingly.

3ch-b. A Charging Data Request [Initial] is sent to CHF, indicating "in-bound roamer".

If receive 5GS CIoT optimization indicators, the V-SMF may provide charging information related to 5GS CIoT to CHF..

3ch-c. The CHF opens a CDR (indicating "in-bound roamer")

3ch-d. The CHF acknowledges by sending Charging Data Response[Initial] to the SMF and optionally supplies a "Roaming Charging Profile" to the V-SMF which overrides the default one.

10. UPF selection.

11. If dynamic PCC is deployed, SM policy association modification.

11ch-a. Based on UE is identified as roaming in a different PLMN, the CHF is selected accordingly.

11ch-b. A Charging Data Request [Initial] is sent to CHF, indicating "out-bound roamer", with the "Roaming Charging Profile" received from the VPLMN.

11ch-c. The CHF opens a CDR (indicating "out-bound roamer").

11ch-d. The CHF acknowledges by sending Charging Data Response[Initial] to the H-SMF and supplies the HPLMN selected "Roaming Charging Profile" (either the same as the one received from VPLMN, either its own selected) to the H-SMF.

If receive 5GS CIoT optimization indicators, the V-SMF may provide charging information related to 5GS CIoT to CHF.

[12a-b]. The SMF initiates an N4 Session Establishment procedure with the selected UPF.

12ch. Counts per QFI are started.

13. Nsmf\_PDUSession\_Create Response from H-SMF to V-SMF

13ch-a. Based on "received PDU session conditions" trigger, a Charging Data Request [Update] is sent to CHF with charging information received from H-SMF, which includes the HPLMN selected "Roaming Charging Profile" and counts per QFI are started.

13ch-b. The CHF updates the CDR.

13ch-c. The CHF acknowledges by sending Charging Data Response[Update] to the V-SMF.

19a-b. N4 session modification.

19ch-a. Counts per rejected QFI(s) are closed. A Charging Data Request [Update] is sent to CHF to report if needed.

19ch-b. The CHF updates the CDR.

19ch-c. The CHF acknowledges by sending Charging Data Response[Update] to the V-SMF.

23. Nsmf\_PDUSession\_UpdateRequest from V-SMF to H-SMF. The rejected QFI(s) are notified to H-SMF.

23ch-a. Counts per rejected QFI(s) are closed. A Charging Data Request [Update] is sent to CHF to report if needed.

23ch-b. The CHF updates the CDR.

23ch-c. The CHF acknowledges by sending Charging Data Response[Update] to the H-SMF.

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| **End of changes** |