**3GPP TSG-SA5 Meeting #142-e *S5-222426rev2***

**e-meeting, 4th – 12th April 2022** Revision of S5-20xxxx

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **32.255** | **CR** | **0** | **rev** | **1** | **Current version:** | **17.5.0** |  |
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| *For* [***HELP***](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:*** | Additional charging message flow for LBO | | | | | | | | | |
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| ***Source to WG:*** | Huawei | | | | | | | | | |
| ***Source to TSG:*** | S5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | CHROAM | | | | |  | ***Date:*** | | | 2022-04-08 |
|  |  | | | |  | |  | | |  |
| ***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:*** | | For the support of local breakout roaming scenario charging, the general description about local breakout roaming charging message flows should be introduced.  There are two options for the interaction between V-SMF and CHF(V-CHF and H-CHF).  - Option 1:V-SMF triggers and sends the charging data request to the V-CHF and H-CHF at the same time.  - Option 2:V-SMF triggers and sends the charging data request to V-CHF firstly and then sends the charging data request to H-CHF.  If the Roaming Charing Profile is only used for the QBC triggers setting, the option 1 and opion 2 are both applicable. If the Roaming Charging Profile is used for negotiation and QBC triggers setting, the option 2 is preferred.  If the V-CHF may reject the charging data request, the option 2 is preferred, otherwise, the SMF should terminate the charging session again with the H-CHF.  If the H-CHF may reject the charging data request, in the option 1 and option 2, the SMF should terminate the charging session with the V-CHF.  The message flow describes the option 2. | | | | | | | | |
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| ***Summary of change:*** | | Add the charging message flows for the support of local breakout roaming scenario charging. | | | | | | | | |
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| ***Consequences if not approved:*** | | The support of the local breakout roaming scenario charging is incomplete. | | | | | | | | |
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| ***Clauses affected:*** | | 5.2.2.X (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 ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

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| **First change** |

#### 5.2.2.X PDU session charging for roaming in Local breakout scenario

##### 5.2.2.X.1 General

The clause below describes PDU session charging in roaming with local breakout scenarios.

##### 5.2.2.X.2 PDU session establishment

The following figure 5.2.2.X.2-1 describes a PDU session establishment charging, based on figure 4.3.2.2.1-1 UE-requested PDU Session Establishment for non-roaming and roaming with local breakout TS 23.502 [202] description:



Figure 5.2.2.X.2-1: PDU session establishment

9ch-a. The UE is identified as a roamer (PLMN ID of the received SUPI is different from VPLMN PLMN ID), the V-CHF and H-CHF are selected accordingly.

9ch-b1. The Charging Data Request [Initial] is sent to V-CHF, indicating "in-bound roamer" for authorization for the subscriber to start the PDU session which is triggered by start of PDU session charging event.

9ch-c1. The V-CHF opens a CDR (indicating "in-bound roamer")

9ch-d1. The V-CHF acknowledges by sending Charging Data Response [Initial] to the V-SMF and optionally supplies a "Roaming Charging Profile" to the V-SMF which overrides the default one.

9ch-b2. A Charging Data Request [Initial] is sent to H-CHF, with charging id and the "Roaming Charging Profile" form V-CHF.

This step may request the quota from V-SMF, H-CHF can grant the quota in the step 9ch-h.

9ch-c2. The H-CHF opens a CDR .

9ch-d2. The H-CHF acknowledges by sending Charging Data Response [Initial] to the V-SMF and optionally supplies the HPLMN selected "Roaming Charging Profile" to the V-SMF.

10ch-a1. The Charging Data Request [Update] is sent to V-CHF, when triggers for QBC is armed with the HPLMN selected "Roaming Charging Profile"

10ch-b1. The V-CHF update the CDR.

10ch-c1. The V-CHF acknowledges by sending Charging Data Response [Update] to the V-SMF.

10ch-a2. A Charging Data Request [update] is sent to H-CHF, when the FBC or QBC triggers specified in the clause 5.2.1 is armed.

This step may occur in case "start of service data flow" needs quota from H-CHF, for the V-SMF to request quota.

10ch-b2. The H-CHF update a CDR.

10ch-c2. The H-CHF acknowledges by sending Charging Data Response [Initial] to the V-SMF.

##### 5.2.2.X.3 PDU Session Modification

The following figure 5.2.2.X.3-1 describes the PDU session modification charging, based on figure 4.3.3.2-1 UE or network requested PDU Session Modification (for non-roaming and roaming with local breakout) TS 23.502 [202] description:



Figure 5.2.2.X.3-1: PDU Session Modification

2ch-a1. The Charging Data Request [Update] is sent to V-CHF for reporting the charging information when the corresponding trigger for QBC specified in the clause 5.2.1 is armed.

2ch-b1. The V-CHF update the CDR.

2ch-c1. The V-CHF acknowledges by sending Charging Data Response [Update] to the V-SMF.

2ch-a2. A Charging Data Request [update] is sent to H-CHF, when the FBC or QBC triggers specified in the clause 5.2.1 is armed.

This step may occur in case "start of service data flow" needs quota from H-CHF, for the V-SMF to request quota.

2ch-b2. The H-CHF update a CDR.

2ch-c2. The H-CHF acknowledges by sending Charging Data Response [Initial] to the V-SMF.

##### 5.2.2.x.4 PDU Session Release

The following figure 5.2.2.x.4-1 describes the PDU session release charging, based on figure 4.3.4.2-1 UE or network requested PDU Session Release for non-roaming and roaming with local breakout TS 23.502 [202] description:



Figure 5.2.2.X.4-1: PDU Session Release

2ch-a1. The Charging Data Request [Termination] is sent to V-CHF.

2ch-b1. The V-CHF close the CDR.

2ch-c1. The V-CHF acknowledges by sending Charging Data Response [Termination] to the V-SMF.

2ch-a2. A Charging Data Request [Termination] is sent to H-CHF.

2ch-b2. The H-CHF close a CDR.

2ch-c2. The H-CHF acknowledges by sending Charging Data Response [Termination] to the V-SMF.

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| **End of change** |