**3GPP TSG-SA5 Meeting #142-e *S5-222429***

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

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **32.255** | **CR** | **0** | **rev** | **-** | **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 and charging information for MVNO | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei | | | | | | | | | |
| ***Source to TSG:*** | S5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | CHROAM | | | | |  | ***Date:*** | | | 2022-03-25 |
|  |  | | | |  | |  | | |  |
| ***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 MVNO (with CHF) charging, the message flow and charging information are introduced. | | | | | | | | |
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| ***Summary of change:*** | | Add the charging message flow and charging information for the support of MVNO (with CHF) charging. | | | | | | | | |
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| ***Consequences if not approved:*** | | The support of the MVNO (with CHF) charging is incomplete. | | | | | | | | |
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| ***Clauses affected:*** | | X.3(New), X.4(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** |

# X.3 Message flow

#### 5.2.2.X PDU session charging for MVNO (with CHF)

##### 5.2.2.X.1 General

The clause below describes PDU session charging for MVNO (with CHF).

##### 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-a1. The UE is identified as a MVNO user (PLMN ID of the received SUPI is different from PLMN PLMN ID), the CHF is selected accordingly.

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

9ch-c1. The CHF opens a CDR

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

9ch-a2. Based on the agreement, the A-CHF is selected.

9ch-b2. A Charging Data Request [Initial] is sent to A-CHF, with charging id.

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

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

9ch-d2. The A-CHF acknowledges by sending Charging Data Response [Initial] to the SMF and supplies the MVNO set the QBC triggers via the "Roaming Charging Profile" to the SMF.

10ch-a1. The Charging Data Request [Update] is sent to CHF, when triggers for QBC or the triggers for FBC is armed.

10ch-b1. The CHF update the CDR.

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

10ch-a2. A Charging Data Request [update] is sent to A-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 A-CHF, for the SMF to request quota.

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

10ch-c2. The A-CHF acknowledges by sending Charging Data Response [Initial] to the 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 CHF for reporting the charging information when the corresponding trigger for FBC and/or QBC specified in the clause 5.2.1 is armed.

2ch-b1. The CHF update the CDR.

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

2ch-a2. A Charging Data Request [update] is sent to A-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 A-CHF, for the SMF to request quota.

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

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

2ch-b1. The CHF close the CDR.

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

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

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

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

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| **Next change** |

# X.4 Definition of charging information

## X.4.1 Data description for 5G data connectivity charging

### X.4.1.1 Message contents

#### X.4.1.1.1 General

This clause describes the messages content applicable for 5G data connectivity-MNVO (with CHF) charging, based on the Charging Data Request and Charging Data Response specified in TS 32.290 [57], including the charging information.

The following clauses describe the different fields used in the Charging Data messages and the category in the tables for MVNO (with CHF) charging is used according to the charging data configuration defined in clause 5.4 of TS 32.240 [1].

Information Elements are provided with explicit description when specific, and indicated with "This field is not applicable" to reflect the Information Element is not part of the dedicated profile.

#### X.4.1.1.2 Charging Data Request message

The basic structure of a Charging Data Request message from the SMF as used for MVNO (with CHF) charging refers to the local breakout roaming scenario charging specified in the table 6.1.1.2.1.

#### X.4.1.1.3 Charging data response message

The basic structure of a Charging Data Response message from the CHF as used for MVNO (with CHF) charging refers to the local breakout roaming scenario charging specified in the table 6.1.1.2.2.

### X.4.1.2 Ga message contents

### X.4.1.3 CDR description on the Bd interface

#### X.4.1.3.1 General

This clause describes the CDR content and format generated for 5G data connectivity – MVNO (with CHF) charging.

The following tables provide a brief description of each CDR parameter. The category in the tables is used according to the charging data configuration defined in clause 5.4 of TS 32.240 [1]. Full definitions of the CDR parameters, sorted by the name in alphabetical order, are provided in TS 32.298 [51].

#### X.4.1.3.2 PDU session charging CHF CDR data

If enabled, CHF CDRs for PDU session charging shall be produced for each PDU session. In MVNO (with CHF) charging scenario, the PDU session charging CHF CDR may cover both Flow based Charging and Qos flow Based Charging (QBC) from SMF.

The fields of PDU session charging CHF CDR are specified in table 6.1.3.2.1.

#### X.4.1.3.3 QBC CHF CDR data

If enabled, CHF CDRs for QBC shall be produced in PLMN for each PDU session established for an MVNO user. The fields of QBC CHF CDR are specified in table 6.1.3.3.1.

## X.4.2 5G data connectivity charging specific parameters

### X.4.2.1 Definition of 5G data connectivity charging information

##### X.4.1.2.1 General

The Charging Information parameter used for 5G data connectivity – MVNO (with CHF) charging refers to the local breakout roaming scenario charging specified in the clause 6.2.1.2. 6.2.1.3. 6.2.1.4 and 6.2.1.5.

### X.4.2.2 Detailed message format for converged charging

The clause specifies per Operation Type the charging data that are sent by SMF for 5G data connectivity converged – MVNO (with) charging or offline only – MVNO (with) charging.

Table 6.2.2.1 defines the the supported fields in the *Charging Data Request* and *Charging Data Response* message for 5G data connectivity Local breakout charging is also applicable for the 5G data connectivity– MVNO (with CHF) charging.

### X.4.2.3 Formal 5G data connectivity charging parameter description

The CHF CDR parameters and resources attributes defined in clause 6.2.3 which is applicabe for roaming local breakout charging shall also be applicable for 5G data connectivity– MVNO (with CHF) charging.

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| **End of change** |