**3GPP TSG-SA5 Meeting #142-e *S5-222427rev2***

**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 principles for LBO |
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| ***Source to WG:*** | Huawei |
| ***Source to TSG:*** | S5 |
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| ***Work item code:*** | CHROAM |  | ***Date:*** | 2022-04-08 |
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| ***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 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-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 scenario charging principles should be introduced. |
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| ***Summary of change:*** | Add the charging principles 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:*** | 5.1.9.1,5.1.9.2,5.2.1.2.2 |
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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:*** |  |
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| ***This CR's revision history:*** |  |

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| **First change** |

#### 5.1.9.1 General

Based on roaming agreements between the V-PLMN and the H-PLMN, in Home Routed scenario, for each UE roaming in VPLMN:

- The SMF in VPLMN (V-SMF) shall be able to collect charging information per QoS Flow within a PDU session when UE is determined as an in-bound roamer, for CDR generation in VPLMN.

- The SMF in HPLMN (H-SMF) shall be able to collect charging information per QoS Flow within a PDU session when UE is determined as an out-bound roamer, for CDR generation in HPLMN.

This charging information collection mechanism is achieved under Roaming QoS flow Based Charging (QBC) performed by each PLMN, based on a set of charging parameters exchanged between the V-SMF and the H-SMF on a per PDU session basis.

The main parameters exchanged at PDU session establishment are:

- The Charging Id which may include the VPLMN PLMN ID, assigned by the V-SMF and transferred to the H-SMF in the HPLMN.

- Optionally, the "Roaming Charging Profile" negotiated between the VPLMN and the HPLMN.

The parameters exchanged during the PDU session handover from EPS to 5GS in Home routed roaming scenario:

- The Home Provided Charging Id which includes the Charging Id assigned by the H-SMF to the original PDU session over EPS and transferred by the H-SMF to the V-SMF. This Home Provided Charging Id shall be used by the V-SMF to replace the existing Charging Id previously generated by V-SMF.

- Optionally, the "Roaming Charging Profile" negotiated between the VPLMN and the HPLMN on 5GS side.

In roaming Home routed PDU session, upon V-SMF change:

- intra-PLMN V-SMF change: Charging Id, "Roaming Charging Profile" and CHF address (optional) are transferred from the old V-SMF to the new V-SMF.

NOTE: how the new V-SMF selects the CHF is operator specific.

- inter-PLMN V-SMF change: The Charging Id is transferred from the old V-SMF to the new V-SMF.

- The "Roaming Charging Profile" is optionally exchanged between the new V-SMF and the H-SMF as for a PDU session establishment.

Based on roaming agreements between the V-PLMN and the H-PLMN, in local breakout scenario, for each UE roaming in VPLMN:

- The SMF in VPLMN (V-SMF) shall be able to collect charging information per QoS Flow within a PDU session when UE is determined as an in-bound roamer, for CDR generation in VPLMN.

- The SMF in VPLMN (V-SMF) shall be able to collect charging information per QoS Flow and per service data flow within a PDU session when UE is determined as an in-bound roamer, for converged charging in HPLMN.

The main parameters exchanged at PDU session establishment are:

- The Charging Id assigned by the V-SMF and reported to the V-CHF and H-CHF.

- Optionally, for QBC, the "Roaming Charging Profile" is used for the set of triggers, associated category, and trigger thresholds and negotiated between the VPLMN and the HPLMN

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| **Next change** |

#### 5.1.9.2 CHF selection

In roaming Home routed scenario, at PDU session establishment, the CHF selection mechanism specified in clause 5.1.8 applies to:

- The V-SMF for CHF selection in VPLMN, with the following differences:

- CHF address(es) selection mechanisms based on PCF and UDM are not applicable.

- When charging characteristics is used it will be based on local configuration.

- When NRF is used, the V-CHF can be selected based on UE identified as in-bound roamer and the PLMN Id of the H-PLMN;

- The H-SMF for CHF selection in HPLMN, with the following difference: when NRF is used, the H-CHF can be selected based on UE identified as out-bound roamer and the PLMN Id of the V-PLMN.

In roaming Home routed PDU session, upon V-SMF change:

- intra-PLMN V-SMF change: CHF address supplied by the old V-SMF shall be used.

- inter-PLMN V-SMF change: CHF selection mechanism as per V-SMF CHF selection in VPLMN at PDU session establishment.

In roaming Local breakout scenario, at PDU session establishment, the CHF selection mechanism specified in clause 5.1.8 applies to:

The V-SMF for CHF selection in VPLMN, with the following differences:

- CHF address(es) selection mechanisms based on PCF and UDM are not applicable.

- When charging characteristics is used it will be based on local configuration.

- NRF based discovery. The V-CHF can be selected based on UE identified as in-bound roamer and the PLMN Id of the H-PLMN;

The V-SMF for CHF selection in HPLMN, with the following differences:

- CHF address(es) selection mechanisms based on PCF, UDM, and local configuration are not applicable.

- NRF based discovery, the H-CHF can be selected based on the H-PLMN of the UE

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| **Next change** |

##### 5.2.1.2.2 QoS flow Based Charging (QBC) triggers

The set of chargeable events and associated category, which shall be supported by the SMF as the default for QoS flow Based Charging, when applicable, is specified in the sub-clause 5.2.1.6.

Two level of triggers can be supplied by the CHF:

- Triggers associated to the PDU session.

- Triggers associated to a QoS Flow within the PDU session.

The set of triggers along with their category (i.e. immediate or deferred report) and level (i.e. per PDU session or per QoS Flow), which can be supplied by the CHF to the SMF for 5G data connectivity converged charging are detailed in the sub-clause 5.2.1.6 for QBC.

In Home Routed roaming scenario, when QBC is used in the context of roaming, the set of triggers, their associated category, and trigger thresholds, compose the "Roaming Charging Profile", which governs the SMF charging data generation, synchronously between the V-SMF and the H-SMF when shared.

In local breakout scenario, the default "Roaming charging profile" for the V-SMF is based on the “Charging characteristics”, and may be set, changed, applied, and transferred in the following order:

1. Default set by V-SMF and transferred to V-CHF

2. Changed by V-CHF and transferred to V-SMF

3. Transferred to H-CHF

4. Changed by H-CHF and transferred to V-SMF

5. Applied in V-SMF and transferred to V-CHF

Support for “Roaming changing profile” exchange is done by transferring it i.e., an NF may only change the “Roaming charging profile” if it has received it. The "Roaming charging profile" resulting from the exchange between the VPLMN and HPLMN shall remain valid until it is replaced.

The "Roaming charging profile" overrides any triggers set or updated by the CHF for Roaming QBC.

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| **End of change** |