**3GPP TSG-SA5 Meeting #129e *S5-201160rev1***

**e-meeting, 24 February – 4 March 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **32.255** | **CR** |  | **rev** | **1** | **Current version:** |  |  |
|  | | | | | | | | |
| *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:*** | Introduction of V-SMF change in Roaming HR - flows | | | | | | | | | |
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| ***Source to WG:*** |  | | | | | | | | | |
| ***Source to TSG:*** | S5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | ETSUN | | | | |  | ***Date:*** | | |  |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | |  |
|  | *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-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
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| ***Reason for change:*** | | Based on TS 23.502 clause 4.23.1, in deployments topologies with specific SMF Service Areas, if a UE moves out of V-SMF serving area in the serving PLMN, the V-SMF can be changed for a Roaming Home Routed PDU session.  Based on below Note in TS 23.502 clause 4.2.2.2.2, the V-SMF change can be inter-PLMN (session continuity can be supported when V-SMF change is inter-PLMN).  NOTE 8: If the UE moves into a different PLMN, the AMF in the serving PLMN can insert or change the V-SMF(s) in the serving PLMN for Home Routed PDU session(s). In this case, the same procedures described in clause 4.23.3 are applied for the V-SMF change as for the I-SMF change (i.e. by replacing the I-SMF with V-SMF). During inter-PLMN change, if the same SMF is used, session continuity can be supported depending on operator policies.  The V-SMF change intra-PLMN and inter-PLMN scenarios are not addressed. | | | | | | | | |
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| ***Summary of change:*** | | Introduce V-SMF change scenarios flows for a PDU session in Roaming Home Routed. | | | | | | | | |
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| ***Consequences if not approved:*** | | V-SMF change in deployments topologies with specific SMF Service Areas cannot be supported. | | | | | | | | |
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| ***Clauses affected:*** | | 5.2.2.14.1, 5.2.2.14.x(New), 5.2.2.14.y(New) | | | | | | | | |
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|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | |  | | |
| ***affected:*** | |  | **X** | Test specifications | | | |  | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | |  | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

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| **First change** |

##### 5.2.2.14.1 General

When the I-SMF is inserted, re-allocated, or removed in a PDU Session as specified in TS 23.501 [200], the SMF may report the charging information to the CHF.

When the I-SMF with UL CL/BP is inserted based on information received from SMF, the I-SMF forwards traffic usage information to the SMF as specified in TS 23.501 [200].

When the V-SMF is changed for a Home Routed PDU Session as specified in TS 23.502 [201], the H-SMF may report the charging information to the H-CHF.

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| **Next change** |

##### 5.2.2.14.x Roaming Home routed PDU session - inter-PLMN V-SMF change

The following figure 5.2.2.14.x.1 describes the Home Routed PDU Session case in which the UE moves out of V-SMF service area in the serving PLMN to a new PLMN V-SMF service area, based on figure 4.23.4.3-1 of TS 23.502 [201], with I-SMF replaced by V-SMF in I-SMF change scenario:



Figure 5.2.2.14.x.1: Roaming Home routed PDU session inter-PLMN V-SMF change

0cha: Ongoing charging session in old VPLMN for UE served by old V-SMF, using Charging Id1.

0chb: Ongoing charging session for HPLMN for UE served by old V-SMF, using Charging Id1.

1-2. UE moves into a different PLMN, and the new AMF determines the new V-SMF based on service area.

3- 4b. SM Context retrieval by new V-SMF from the old V-SMF. The Home Provided Charging Id containing Charging Id1 value is conveyed to the new V-SMF.

4ch-a. The UE is identified as a roamer, the CHF is selected accordingly.

4ch-b. A Charging Data Request [Initial] is sent to V-CHF, indicating "in-bound roamer", with charging Id = Charging Id1 contained in the Home Provided Charging Id received on step 4b.

4ch-c. The V-CHF opens a CDR (indicating "in-bound roamer").

4ch-d. 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.

5-7c. Refer steps 5 to 7c in Figure 4.23.4.3-1 of TS 23.502 [201].

8a. Nsmf\_PDUSession\_Update Request from new V-SMF towards the H-SMF with the "Roaming Charging Profile".

8ach-a. A Charging Data Request [Update] is sent to H-CHF in HPLMN, indicating the V-SMF change and "Roaming Charging Profile" received from the VPLMN.

8ach-b. The H-CHF in HPLMN updates the CDR.

8ach-c. The H-CHF in HPLMN acknowledges by sending Charging Data Response [Update] to the H-SMF and supplies the HPLMN selected "Roaming Charging Profile" for this VPLMN.

8c. Nsmf\_PDUSession\_Create Response from H-SMF to new V-SMF with the "Roaming Charging Profile".

8cch-a. A Charging Data Request [Update] is sent to V-CHF with charging information received from H-SMF, which includes the HPLMN selected "Roaming Charging Profile".

8cch-b. The V-CHF updates the CDR.

8cch-c. The V-CHF acknowledges by sending Charging Data Response [Update] to the V-SMF.

9, 17-21. Refer steps 9 and 17 to 21 in Figure 4.23.4.3-1 of TS 23.502 [201].

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| **Next change** |

##### 5.2.2.14.y Roaming Home routed PDU session - intra-PLMN V-SMF change

The following figure 5.2.2.14.y.1 describes the Home Routed PDU Session case in which the UE moves out of V-SMF service area in the serving PLMN to a new V-SMF service area in the serving PLMN, based on figure 4.23.4.3-1 of TS 23.502 [201], with I-SMF replaced by V-SMF in I-SMF change scenario:



Figure 5.2.2.14.y.1: Roaming Home routed PDU session intra-PLMN V-SMF change

0cha and Ochb: same as in Figure 5.2.2.14.x.1

1-2. UE moves out of the old V-SMF service area, and the new AMF determines the new V-SMF service area in the same VPLMN.

3- 4b. SM Context retrieval by new V-SMF from the old V-SMF. The Home Provided Charging Id containing Charging Id1 value, the "Home Roaming Charging Profile", and the V-CHF address, are conveyed to the new V-SMF.

4ch-a. A Charging Data Request [Initial] is sent to V-CHF, indicating "in-bound roamer", with charging Id containing the Home Provided Charging Id (i.e. Charging Id1) received on step 4b.

NOTE: Since the same V-CHF is used, the Home Roaming Charging Profile to be used is already known by the V-CHF

4ch-b. The V-CHF opens a CDR (indicating "in-bound roamer").

4ch-c. The V-CHF acknowledges by sending Charging Data Response [Initial] to the V-SMF.

5-21. Same steps as in Figure 5.2.2.14.x.1, except the "Roaming Charging Profile" is not renegotiated, i.e.not contained in steps 8a, 8ach-a, 8ach-c, 8c and 8cch-a.

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| **End of changes** |