**3GPP TSG-WG SA2 Meeting #146E e-meeting  *S2-2106266r03***

**Elbonia, August 16 – 27, 2021 (revision of S2-210xxxx)**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **23.502** | **CR** | **3079** | **rev** | **-** | **Current version:** | **17.1.0** |  |
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| *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:*** | Support of I-SMF removal | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon, ZTE, **Nokia, Nokia Shanghai Bell** | | | | | | | | | |
| ***Source to TSG:*** | SA2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eEDGE\_5GC | | | | |  | ***Date:*** | | | 2021-08-09 |
|  |  | | | |  | |  | | |  |
| ***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)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | According to clause 4.3.5.1 and clause 4.23.5.4, SMF sends target DNAI information to AMF which includes target DNAI and an indicator on whether I-SMF selection or SMF selection should be performed.  For I-SMF selection in clause 4.23.5.4, there is a scenario that I-SMF needs to be removed, e.g. an I-SMF has already been inserted for an existing PDU Session but SMF decides the target DNAI can be served by itself. It’s not clear how the SMF can trigger such an I-SMF removal if the removal is caused by PCC request.  In current specification, when AMF receives the target DNAI information which includes target DNAI and I-SMF selection indicator, the AMF will perform I-SMF selection for current PDU Session based on the target DNAI even though the SMF can server the target DNAI and no I-SMF is needed.  To avoid unnecessary I-SMF selection, it’s proposed that the AMF shall decide to remove the exist I-SMF if the SMF can server the target DNAI. | | | | | | | | |
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| ***Summary of change:*** | | Add I-SMF removal case into clause 4.23.5.4. | | | | | | | | |
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| ***Consequences if not approved:*** | | I-SMF cannot be removed for an existing PDU Session once the I-SMF is inserted. | | | | | | | | |
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| ***Clauses affected:*** | | 4.23.5.4 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

\* \* \* \* First change \* \* \* \*

#### 4.23.5.4 I-SMF selection per DNAI



Figure 4.23.5.4-1: I-SMF selection per DNAI

1. The PCF sends to the SMF PCC rule(s) including the DNAI(s) for the PDU sessions by invoking Npcf\_SMPolicyControl\_UpdateNotify service operation.

Based on the received DNAI(s) information, the SMF may subscribe to the UE mobility event notification from the AMF (e.g. UE moves into or out of Area of Interest).

The SMF determines the target DNAI(s) which are applicable to the current UE location. Then the SMF may decide the target DNAI finally.

2. The SMF invokes a Nsmf\_PDUSession\_SMContextStatusNotify service operation (or Nsmf\_PDUSession\_StatusNotify) if it (or the associated old I-SMF) cannot serve the target DNAI or if the SMF can serve the target DNAI and the existing I-SMF is not needed . The content of the message includes the target DNAI information which indicates that the I-SMF selection is expected. This is to trigger the AMF to (re)select a suitable I-SMF, or remove the existing I-SMF (in case the AMF decides that the SMF can serve the Target DNAI) for the PDU Session. The target DNAI is used for selecting (I-)SMF, which controls UPF connecting to that DNAI.

If there is an I-SMF serving the PDU session, the SMF invokes Nsmf\_PDUSession\_StatusNotify and then the I-SMF invokes Nsmf\_PDUSession\_SMContextStatusNotify message to send the target DNAI information for existing PDU session to AMF.

3. If the I-SMF selection is expected, the AMF selects a new I-SMF which can serve the target DNAI or remove the existing I-SMF (in case the AMF decides that the SMF can serve the Target DNAI) for the existing PDU Session as described in clause 5.34.3 of TS 23.501 [2].

4. The AMF sends a Nsmf\_PDUSession\_CreateSMContext Request to the new I-SMF as described in step 3 of clause 4.23.4.3, or to the SMF as described in step 10 of clause 4.23.4.3, with the following enhancement:

The AMF includes target DNAI received from SMF in the message. When the UE is in CONNECTED state the AMF also include indication of no NG-RAN change.

5. The procedure described in clauses 4.23.4.3 (case: I-SMF insertion or I-SMF change) starting from step 4 takes place with the following difference:

In step 4a, the (target) new I-SMF sends the indication of no NG-RAN change to the old I-SMF or SMF as it is received from AMF.

In step 4b, when the old I-SMF or SMF receives indication of no NG-RAN change it include the additional Downlink Tunnel Info of NG-RAN in the SM context of the PDU Session.

In step 5, the I-SMF selects the I-UPF based on target DNAI.

In step 6, the target I-SMF should reuse the downlink Tunnel Info of serving RAN node if received from old I-SMF/SMF as described in clause 4.23.4.3.

In step 9, if the new I-SMF receives the Downlink Tunnel Info of NG-RAN, the N2 SM information includes PDU Session Resource Modification message.

The procedure described in clauses 4.23.4.3 (case: I-SMF removal) starting from step 11 takes place with the following difference:

In step 11a, the SMF sends an indication of no NG-RAN change to the old I-SMF as it received from AMF.

In step 11b, when the old I-SMF receives indication of no NG-RAN change it include the additional Downlink Tunnel Info of NG-RAN in the SM context of the PDU Session.

In step 12, the SMF selects a new I-UPF based on target DNAI.

In step 16, if the SMF receives the Downlink Tunnel Info of NG-RAN, the N2 SM information includes PDU Session Resource Modification message.

If the UE is in IDLE state the step 17-21 are skipped. Steps 17a and 17b are still performed to release the old I-SMF.

6. The PSA and UL CL/BP controlled by I-SMF is inserted as described from steps 2 to 11 in figure 4.23.9.1-1 is performed with the following difference:

In step 2, the I-SMF selects a new PDU Session Anchor (PSA2) based on the target DNAI received in step 4.

\* \* \* \* End of changes \* \* \* \*