**3GPP TSG-WG SA2 Meeting #154 *S2-2211361***

**Toulouse, France, November 14 – 18, 2022 (revision of S2-2210546)**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **23.502** | **CR** | **3625** | **rev** | **2** | **Current version:** | **17.6.0** |  |
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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:*** | KI#4 23.502 AF traffic influence for common EAS, DNAI selection | | | | | | | | | |
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| ***Source to WG:*** |  | | | | | | | | | |
| ***Source to TSG:*** | SA2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | EDGE\_Ph2 | | | | |  | ***Date:*** | | | 2022-11-04 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-18 |
|  | *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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
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| ***Reason for change:*** | |  | | | | | | | | |
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| ***Summary of change:*** | |  | | | | | | | | |
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| ***Consequences if not approved:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.3.6.1, 5.2.6.7.2, 5.2.5.3.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS23.501 CR3788, TS23.503 CR0776, TS23.548 CR0075 | | |
| ***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 \* \* \* \*

### 4.3.6 Application Function influence on traffic routing

#### 4.3.6.1 General

Clause 4.3.6 describes the procedures between an Application Function and the SMF to maintain an efficient user plane path for Application Functions that require it.

As described in clause 5.6.7 of TS 23.501 [2], an Application Function may send requests to influence SMF routeing decisions for User Plane traffic of PDU Sessions. The AF requests may influence UPF (re)selection and allow routeing of user traffic to a local access (identified by a DNAI) to a Data Network. The AF may also provide in its request subscriptions to SMF events.

The following cases can be distinguished:

- AF requests targeting an individual UE by a UE address; these requests are routed (by the AF or by the NEF) to an individual PCF using the BSF. This is described in clause 4.3.6.4.

NOTE 1: Such requests target an on-going PDU Session. Whether the AF needs to use the NEF or not is according to local deployment.

- AF requests described in clause 5.6.7 of TS 23.501 [2] targeting a group of UE(s), or any UE accessing a combination of DNN and S-NSSAI, or targeting individual UE(s) by one or more GPSI(s) as described in table 5.6.7-1. These AF requests may also affect UE(s) with an established PDU session. For such requests the AF shall contact the NEF and the NEF stores the AF request information in the UDR. PCF(s) receive a corresponding notification if they had subscribed to the creation / modification/ deletion of the AF request information corresponding to UDR Data Keys / Data Sub-Keys. This is defined in clause 6.3.7.2 of TS 23.501 [2] and further described in clause 4.3.6.2.

NOTE 2: Such requests can target on-going or future PDU Sessions.

If the AF interacts with PCF via the NEF, the NEF performs the following mappings where needed:

- Map the AF-Service-Identifier into DNN and S-NSSAI combination, determined by local configuration.

- Map the AF-Service-Identifier into a list of DNAI(s) and Routing Profile ID(s) determined by local configuration.

The NEF can only provide this mapping when the DNAI(s) being used by the applications are statically defined. When the DNAI(s) where applications are instantiated may vary dynamically, the AF should provide the target DNAI(s) in its request together with either Routing Profile ID(s) or with N6 traffic routing information.

- Map the GPSI in Target UE Identifier into SUPI, according to information received from UDM.

- Map the External Group Identifier in Target UE Identifier into Internal Group Identifier, according to information received from UDM.

- Map the geographical area in Spatial Validity Condition into areas of validity, determined by local configuration.

#### 4.3.6.2 Processing AF requests to influence traffic routing for Sessions not identified by an UE address



Figure 4.3.6.2-1: Processing AF requests to influence traffic routing for Sessions not identified by an UE address

NOTE 1: The 5GC functions used in this scenario are assumed to all belong to the same PLMN (HPLMN in non-roaming case or VPLMN in the case of a PDU Session in LBO mode).

NOTE 2: Nnef\_TrafficInfluence\_Create or Nnef\_TrafficInfluence\_Update or Nnef\_TrafficInfluence\_Delete service operations invoked from an AF located in the HPLMN for local breakout and home routed roaming scenarios are not supported.

1. To create a new request, the AF invokes a Nnef\_TrafficInfluence\_Create service operation. The content of this service operation (AF request) is defined in clause 5.2.6.7. The request contains also an AF Transaction Id. If it subscribes to events related with PDU Sessions the AF indicates also where it desires to receive the corresponding notifications (AF notification reporting information).

To update or remove an existing request, the AF invokes a Nnef\_TrafficInfluence\_Update or Nnef\_TrafficInfluence\_Delete service operation providing the corresponding AF Transaction Id.

The Nnef\_TrafficInfluence\_Create (initiated by target AF) or Nnef\_TrafficInfluence\_Update (initiated by source AF or target AF) service operation may be used for the case of AF instance change. If Nnef\_TrafficInfluence\_Update service operation is invoked, the NEF is required to update the subscription resource. The Nnef\_TrafficInfluence\_Update service operation may include an updated notification target address. The updated subscription resource is used by the target AF.

NOTE 3: If the source AF transfers the application context to the target AF, then target AF may create new subscription via Nnef\_TrafficInfluence\_Create operation or update existing subscription via Nnef\_TrafficInfluence\_Update. However, whether and how the application context transfer is done is out of this specification.

2. The AF sends its request to the NEF. If the request is sent directly from the AF to the PCF, the AF reaches the PCF selected for the existing PDU Session by configuration or by invoking Nbsf\_management\_Discovery service.

The NEF ensures the necessary authorization control, including throttling of AF requests and, as described in clause 4.3.6.1, mapping from the information provided by the AF into information needed by the 5GC.

3. (in the case of Nnef\_TrafficInfluence\_Create or Update): The NEF stores the AF request information in the UDR (Data Set = Application Data; Data Subset = AF traffic influence request information, Data Key = AF Transaction Internal ID, S-NSSAI and DNN and/or Internal Group Identifier or SUPI).

NOTE 4: Both the AF Transaction Internal ID and, S-NSSAI and DNN and/or Internal Group Identifier or SUPI are regarded as Data Key when the AF request information are stored into the UDR, see Table 5.2.12.2.1-1.

(in the case of Nnef\_TrafficInfluence\_delete): The NEF deletes the AF requirements in the UDR (Data Set = Application Data; Data Subset = AF traffic influence request information, Data Key = AF Transaction Internal ID).

The NEF responds to the AF.

4. The PCF(s) that have subscribed to modifications of AF requests (Data Set = Application Data; Data Subset = AF traffic influence request information, Data Key = S-NSSAI and DNN and/or Internal Group Identifier or SUPI) receive(s) a Nudr\_DM\_Notify notification of data change from the UDR.

5. The PCF determines if existing PDU Sessions are potentially impacted by the AF request. For each of these PDU Sessions, the PCF updates the SMF with corresponding new policy information about the PDU Session by invoking Npcf\_SMPolicyControl\_UpdateNotify service operation as described in steps 5 and 6 in clause 4.16.5.

If the AF request includes a notification reporting request for UP path change, the PCF includes in the PCC rule(s) the information required for reporting the event, including the Notification Target Address pointing to the NEF or AF and the Notification Correlation ID containing the AF Transaction Internal ID.

If the AF request includes an EAS Correlation indication or indication of traffic correlation, PCF includes in the PCC rule(s) an EAS Correlation indication or indication of traffic correlation, and a Application ID corresponding to a set of UEs that AF request aims at.

The PCF includes the Application ID into the PCC rule(s) if included into the traffic influence information in the UDR. The SMF may use the Application ID to correlate the EAS Deployment Information with the PCC Rule as described in TS 23.548 [130]. If the SMF receives the list of DNAI(s) for the same application from the PCC rule and from EAS Deployment Information, the SMF ignores the configured list of DNAI(s) in the EAS Deployment Information.

If the indication of the traffic correlation or EAS Correlation is set in the PCC rule that includes an Application ID, the SMF can use the Application ID to determine that the UE belongs to a set of UEs identified by the Application ID and the PDU Session needs to use a common EAS for the set of UEs.

The PCF may, optionally, use service experience analytics per UP path, as defined in clause 6.4.3 of TS 23.288 [50], to provide an updated list of DNAI(s) to the SMF.

6. When the updated policy information about the PDU Session is received from the PCF, the SMF may take appropriate actions to reconfigure the User plane of the PDU Session. The SMF may consider service experience analytics and/or DN Performance analytics per UP path (i.e. including UPF and/or DNAI and/or AS instance) as defined in clauses 6.4.3 and 6.14.3, respectively, of TS 23.288 [50] before taking such actions. Examples of actions are:

- Determining a target DNAI and adding, replacing or removing a UPF in the data path to e.g. act as an UL CL or a Branching Point e.g. as described in clause 4.3.5.

- Allocate a new Prefix to the UE (when IPv6 multi-Homing applies).

- Updating the UPF in the target DNAI/Common DNAI with new traffic steering rules.

- Subscribe to notifications from the AMF for an Area of Interest via Namf\_EventExposure\_Subscribe service operation.

- Determining whether to relocate PSA UPF considering the user plane latency requirements provided by the AF (see clause 6.3.6 of TS 23.548 [74]).

When the updated policy information about the PDU Session is received from the PCF, the SMF may take appropriate actions to assist the EAS discovery and re-discovery for PDU Session with Session Breakout connectivity model such as:

- Retrieve the EAS deployment information as defined in clause 6.2.3.4.1 of TS 23.548 [74].

- Providing DNS message handling rule to forward DNS messages of the UE and/or report when detecting DNS messages as defined in clause 6.2.3.2.2 of TS 23.548 [74].

- Use the Application ID in EAS Deployment Information to find the corresponding PCC rule(s) for the application as described in TS 23.548 [130].

7. The SMF may decide whether it is required to send the target DNAI to the AMF for triggering SMF/I-SMF (re)selection and then inform the target DNAI information for the current PDU session or for the next PDU session to AMF via Nsmf\_PDUSession\_SMContextStatusNotify service operation.

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