**3GPP TSG- WG2 Meeting #154 *S2-2210374***

**Toulouse, 14 - 18 Nov, 2022**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **23.502** | **CR** | **3608** | **rev** |  | **Current version:** | **17.6.0** |  |
|  | | | | | | | | |
| *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:*** | NEF and UDR service update to support for DNAI mapping | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | China Mobile | | | | | | | | | |
| ***Source to TSG:*** | SA2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | **EDGE\_Ph2** | | | | |  | ***Date:*** | | | 2 |
|  |  | | | |  | |  | | |  |
| ***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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | This clause contains the service update of UDR and NEF. Add parameters in UDR data management service. And add new service in NEF to support for AF request for DNAI mapping information by providing EAS IP information. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Add the detailed description of Nudr\_DataManagement (DM) service. Add a new service in NEF. | | | | | | | | |
| ***--*** | |  | | | | | | | | |
| ***Consequences if not approved:*** | | 5GC cannot support for DNAI mapping. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.2.12, 5.2.6, 5.2.6.x | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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**

### 5.2.12 UDR Services

#### 5.2.12.1 General

The following Data Set Identifiers shall be considered in this release: Subscription Data, Policy Data, Application data and Data for Exposure. The corresponding Data Subset Identifiers and Data (Sub)Key(s) are defined in Table 5.2.12.2.1-1.

The set of Data Set Identifiers shall be extensible to cater for new identifiers as well as for operator specific identifiers and related data to be consumed.

The following table illustrates the UDR Services.

Table 5.2.12.1-1: NF services provided by UDR

|  |  |  |  |
| --- | --- | --- | --- |
| NF service | Service Operations | Operation Semantics | Example Consumer(s) |
| Data Management (DM) | Query | Request/Response | UDM, PCF, NEF |
|  | Create | Request/Response | NEF |
|  | Delete | Request/Response | NEF |
|  | Update | Request/Response | UDM, PCF, NEF |
|  | Subscribe | Subscribe/Notify | UDM, PCF, NEF |
|  | Unsubscribe |  | UDM, PCF, NEF |
|  | Notify |  | UDM, PCF, NEF |
| GroupIDmap | Query | Request/Response | NRF, SCP |

The following table shows the Exposure data that may be stored in the UDR along with a time stamp using Data Management (DM) Service:

NOTE: When the data in Table 5.2.12.1-2 need to be monitored in real time, they should be monitored directly at the originating NF (e.g. registration state changes may be monitored via the Namf\_EventExposure service) and not use the stored information from UDR if it is not the latest. It is expected that such dynamically changing information (e.g. UE reachability status) is used for statistical purpose and analytics.

Table 5.2.12.1-2: Exposure data stored in the UDR

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Category | Information | Description | Data key | Data Sub key |
| **Access and mobility information** | UE location | Gives the Location or the last known location of a UE (e.g. Tai, Cell Id… both 3GPP and non-3GPP access location) | SUPI or GPSI |  |
|  | UE time zone | Current time zone for the UE | SUPI or GPSI |  |
|  | UE Access type | 3GPP access or non-3GPP access | SUPI or GPSI |  |
|  | UE RAT type | Determined as defined in clause 5.3.2.3 of TS 23.501 [2].  The values are defined in TS 29.571 [70] | SUPI or GPSI |  |
|  | UE registration state | Registered or Deregistered | SUPI or GPSI |  |
|  | UE connectivity state | IDLE or CONNECTED | SUPI or GPSI |  |
|  | UE reachability status | It indicates if the UE is reachable for sending either SMS or downlink data to the UE, which is detected when the UE transitions to CM-CONNECTED state or when the UE will become reachable for paging, e.g. Periodic Registration Update timer | SUPI or GPSI |  |
|  | UE SMS over NAS service status | SMS over NAS supported or not in the UE | SUPI or GPSI |  |
|  | UE Roaming status | It indicates UE's current roaming status (the serving PLMN and/or whether the UE is in its HPLMN) | SUPI or GPSI |  |
|  | UE Current PLMN | Current PLMN for the UE | SUPI or GPSI |  |
| **Session management** | UE IP address | UE IP address | SUPI or GPSI | PDU session ID or DNN |
| **information** | PDU session status | Active / released | SUPI or GPSI | PDU session ID or DNN or UE IP address |
|  | DNAI | DNAI | SUPI or GPSI | PDU session ID or DNN or UE IP address |
|  | N6 traffic routing information | N6 traffic routing information | SUPI or GPSI | PDU session ID or DNN or UE IP address |
| **DNAI mapping information** | DNAI information | DNAI | EAS IP/IP range/FQDN  (optionally) DNN, S-NSSAI, geographical area | - |

#### 5.2.12.2 Nudr\_DataManagement (DM) service

##### 5.2.12.2.1 General

The operations defined for Nudr\_DM service use following set of parameters defined in this clause:

- Data Set Identifier: uniquely identifies the requested set of data within the UDR (see clause 4.2.5).

- Data Subset Identifier: it uniquely identifies the data subset within each Data Set Identifier. As specified in the procedures in clause 4, e.g. subscription data can consist of subsets particularised for specific procedures like mobility, session, etc.

- Data Keys defined in Table 5.2.12.2.1-1

For Nudr\_DM\_Subscribe and Nudr\_DM\_Notify operations:

- The Target of Event Reporting is made up of a Data Key and possibly a Data Sub Key both defined in Table 5.2.12.2.1-1. When a Data Sub Key is defined in the table but not present in the Nudr\_DM\_Subscribe this means that all values of the Data Sub Key are targeted.

- The Data Set Identifier plus (if present) the (set of) Data Subset Identifier(s) corresponds to a (set of) Event ID(s) as defined in clause 4.15.1

An NF Service Consumer may include an indicator when it invokes Nudr\_DM Query/Create/Update service operation to subscribe the changes of the data, to avoid a separate Nudr\_DM\_Subscribe service operation.

Depending on the use case, it is possible to use a Data Key and/or one or multiple Data sub keys to further identify the corresponding data, as defined in Table 5.2.12.2.1-1 below.

Table 5.2.12.2.1-1: Data keys

|  |  |  |  |
| --- | --- | --- | --- |
| Data Set | Data Subset | Data Key | Data Sub Key |
|  | Access and Mobility Subscription data | SUPI | Serving PLMN ID and optionally NID |
|  | SMF Selection Subscription data | SUPI | Serving PLMN ID and optionally NID |
|  | UE context in SMF data | SUPI | PDU Session ID or DNN |
| Subscription Data (see clause 5.2.3.3.1) | SMS Management Subscription data | SUPI | Serving PLMN ID and optionally NID |
|  | SMS Subscription data | SUPI | Serving PLMN ID and optionally NID |
|  | Session Management Subscription data | SUPI | S-NSSAI |
|  |  |  | DNN |
|  |  |  | Serving PLMN ID and optionally NID |
|  | Slice Selection Subscription data | SUPI | Serving PLMN ID and optionally NID |
|  | Group Data  (NOTE 5) | Internal Group Identifier or  External Group Identifier | - |
|  | Identifier translation | GPSI |  |
|  |  | SUPI | Application Port ID, MTC Provider Information, AF Identifier |
|  | Intersystem continuity Context | SUPI | DNN |
|  | LCS privacy | SUPI | - |
|  | LCS mobile origination | SUPI | - |
|  | UE reachability | SUPI | - |
|  | Group Identifier Translation | Internal Group Identifier or  External Group Identifier | - |
|  | UE context in SMSF data | SUPI | - |
|  | V2X Subscription data | SUPI | - |
|  | ProSe Subscription data | SUPI | - |
|  | User consent | SUPI | Purpose |
|  | ECS Address Configuration Information (See Table 4.15.6.3d-1) | SUPI, Internal group identifier or external group identifier or any UE | DNN, S-NSSAI |
|  | MBS Subscription data | SUPI | - |
|  | Shared data | Shared Data ID | - |
| Application data | Packet Flow Descriptions (PFDs) | Application Identifier | - |
|  | AF traffic influence request information | AF transaction internal ID |  |
|  | (See clause 5.6.7 and clause 6.3.7.2 of TS 23.501 [2]) | S-NSSAI and DNN  and/or  Internal Group Identifier or SUPI or "any UE" indication (NOTE 4) |  |
|  | Background Data Transfer  (NOTE 3) | Internal Group Identifier or SUPI |  |
|  | Service specific information (See clause 4.15.6.7) | S-NSSAI and DNN  or  Internal Group Identifier or SUPI or "any UE" indication (NOTE 4) |  |
|  | EAS Deployment Information  (See clause 7.1 of TS 23.548 [74]) | DNN and/or S-NSSAI | Application Identifier and/or Internal Group Identifier |
|  | AM influence information (See clause 4.15.6.9.3) | AF transaction internal ID |  |
|  |  | S-NSSAI and DNN  and/or  Internal Group Identifier or SUPI or "any UE" indication (NOTE 4) |  |
| Policy Data | UE context policy control data  (See clause 6.2.1.3 of TS 23.503 [20]) | SUPI |  |
|  | PDU Session policy control data | SUPI | S-NSSAI |
|  | (See clause 6.2.1.3 of TS 23.503 [20]) |  | DNN |
|  | Policy Set Entry data  (See clause 6.2.1.3 of TS 23.503 [20]) | SUPI (for the UDR in HPLMN) |  |
|  |  | PLMN ID (for the UDR in VPLMN) |  |
|  | Remaining allowed Usage data | SUPI | S-NSSAI |
|  | (See clause 6.2.1.3 of TS 23.503 [20]) |  | DNN |
|  | Sponsored data connectivity profiles (See clause 6.2.1.6 of TS 23.503 [20]) | Sponsor Identity |  |
|  | Background Data Transfer data  (See clause 6.2.1.6 of TS 23.503 [20]) | Background Data Transfer Reference ID. (NOTE 2) |  |
|  |  | None. (NOTE 1) |  |
|  | Network Slice Specific Control Data  (See clause 6.2.1.3 of TS 23.503 [20]) | S-NSSAI |  |
|  | Operator Specific Data | SUPI or GPSI |  |
| Exposure Data | Access and Mobility Information | SUPI or GPSI | PDU Session ID or |
| (see clause 5.2.12.1) | Session Management information | SUPI or GPSI | UE IP address or DNN |
| DNAI mapping information | EAS IP/IP range/FQDN  (optionally) DNN, S-NSSAI, geographical area | - |
| NOTE 1: Retrieval of the stored Background Data Transfer References for all ASP identifiers in the UDR requires Data Subset but no Data Key or Data Subkey(s).  NOTE 2: Update of a Background Data Transfer Reference in the UDR requires a Data key to refer to a Background Data Transfer Reference as input data.  NOTE 3: The Background Data Transfer includes the Background Data Reference ID and the ASP Identifier that requests to apply the Background Data Reference ID to the UE(s). Furthermore, the Background Data Transfer includes the relevant information received from the AF as defined in clause 6.1.2.4 of TS 23.503 [20].  NOTE 4: When the Data Key targets "any UE", then the request to UDR applies on Application data that applies on all subscribers of the PLMN. For encoding, see TS 29.519 [82].  NOTE 5: Group Data includes 5G VN group configuration and any other data related to a group stored in the UDR. | | | |

The content of the UDR storage for (Data Set Id= Application Data, Data Subset Id = AF TrafficInfluence request information) is specified in clause 5.6.7, Table 5.6.7-1 of TS 23.501 [2]. This information is written by the NEF and read by the PCF(s). PCF(s) may also subscribe to changes onto this information.

## **Second CHANGE**

### 5.2.6 NEF Services

#### 5.2.6.1 General

The following table shows the NEF Services and Service Operations:

Table 5.2.6.1-1: NF Services provided by the NEF

|  |  |  |  |
| --- | --- | --- | --- |
| Service Name | Service Operations | Operation  Semantics | Example Consumer(s) |
| **Nnef\_EventExposure** | Subscribe | Subscribe/Notify | AF, NWDAF |
|  | Unsubscribe |  | AF, NWDAF |
|  | Notify |  | AF, NWDAF |
| **Nnef\_PFDManagement** | Fetch | Request/Response | SMF |
|  | Subscribe | Subscribe/Notify | SMF |
|  | Notify |  | SMF |
|  | Unsubscribe |  | SMF |
|  | Create | Request/Response | AF |
|  | Update | Request/Response | AF |
|  | Delete | Request/Response | AF |
| **Nnef\_EASDeployment** | Create | Request/Response | AF |
|  | Update | Request/Response | AF |
|  | Delete | Request/Response | AF |
|  | Subscribe | Subscribe/Notify | SMF |
|  | Unsubscribe |  | SMF |
|  | Notify |  | SMF |
| **Nnef\_ParameterProvision** | Update | Request/Response | AF |
|  | Create | Request/Response | AF |
|  | Delete | Request/Response | AF |
|  | Get | Request/Response | AF |
| **Nnef\_Trigger** | Delivery | Request/Response | AF |
|  | DeliveryNotify | Subscribe/Notify | AF |
| **Nnef\_BDTPNegotiation** | Create | Request/Response | AF |
|  | Update | Request/Response | AF |
|  | Notify |  | AF |
| **Nnef\_TrafficInfluence** | Create | Request/Response | AF |
|  | Update | Request/Response | AF |
|  | Delete | Request/Response | AF |
|  | Get | Request/Response | AF |
|  | Notify | Subscribe/Notify | AF |
|  | AppRelocationInfo | Subscribe/Notify | AF |
| **Nnef\_ChargeableParty** | Create | Request/Response | AF |
|  | Update | Request/Response | AF |
|  | Notify | Request/Response | AF |
| **Nnef\_AFsessionWithQoS** | Create | Request/Response | AF |
|  | Notify | Request/Response | AF |
|  | Update | Request/Response | AF |
|  | Revoke | Request/Response | AF |
| **Nnef\_MSISDN-less\_MO\_SMS** | Notify | Notify | AF |
| **Nnef\_ServiceParameter** | Create | Request/Response | AF |
|  | Update | Request/Response | AF |
|  | Delete | Request/Response | AF |
|  | Get | Request/Response | AF |
| **Nnef\_APISupportCapability** | Subscribe | Subscribe/Notify | AF |
|  | Unsubscribe | Subscribe/Notify | AF |
|  | Notify | Subscribe/Notify | AF |
| **Nnef\_NIDDConfiguration** | Create | Request/Response | AF |
|  | TriggerNotify | Subscribe/Notify | AF |
|  | UpdateNotify | Subscribe/Notify | AF |
|  | Delete | Request/Response | AF |
| **Nnef\_NIDD** | Delivery | Request/Response | AF |
|  | DeliveryNotify | Subscribe/Notify | AF |
|  | GroupDeliveryNotify | Notify | AF |
| **Nnef\_SMContext** | Create | Request/Response | SMF |
|  | Delete | Request/Response | SMF |
|  | DeleteNotify | Subscribe/Notify | SMF |
|  | Delivery | Request/Response | SMF |
| **Nnef\_AnalyticsExposure** | Subscribe | Subscribe/Notify | AF |
|  | Unsubscribe |  | AF |
|  | Notify |  | AF |
|  | Fetch | Request/Response | AF |
| **Nnef\_UCMFProvisioning** | Create | Request/Response | AF |
|  | Delete | Request/Response | AF |
|  | Update | Request/Response | AF |
| **Nnef\_ECRestriction** | Get | Request/Response | AF |
|  | Update | Request/Response | AF |
| **Nnef\_ApplyPolicy** | Create | Request/Response | AF |
|  | Update | Request/Response | AF |
|  | Delete | Request/Response | AF |
| **Nnef\_Location** | LocationUpdateNotify | Notify | AF |
| **Nnef\_TimeSynchronization** | ConfigUpdate | Request/Response | AF |
|  | ConfigCreate | Request/Response | AF |
|  | ConfigDelete | Request/Response | AF |
|  | ConfigUpdateNotify | Subscribe/Notify | AF |
|  | CapsSubscribe | Subscribe/Notify | AF |
|  | CapsUnsubscribe | Subscribe/Notify | AF |
|  | CapsNotify | Subscribe/Notify | AF |
| **Nnef\_ASTI** | Create | Request/Response | AF |
|  | Update | Request/Response | AF |
|  | Delete | Request/Response | AF |
|  | Get | Request/Response | AF |
| **Nnef\_AMPolicyAuthorization** | Create | Request/Response | AF |
|  | Update | Request/Response | AF |
|  | Delete | Request/Response | AF |
|  | Notify | Subscribe/Notify | AF |
|  | Subscribe |  | AF |
|  | Unsubscribe |  | AF |
| **Nnef\_AMInfluence** | Create | Request/Response | AF |
|  | Update | Request/Response | AF |
|  | Delete | Request/Response | AF |
|  | Notify | Subscribe/Notify | AF |
| **Nnef\_UEId** | Get | Request/Response | AF |
| **Nnef\_SMService** | MoForwardSm | Request/Response | SMS-SC |
| Nnef\_DNAIMapping | Subscribe | Subscribe/Notify | AF |
| Unsubscribe | AF |
| UpdateNotify | AF |

## **Third CHANGE**

#### 5.2.6.x Nnef\_DNAIMapping service

##### 5.2.6.x.1 General

The service is allowing AF to obtain DNAI.

##### 5.2.6.x.2 Nnef\_DNAIMapping\_Subscribe service operation

**Service operation name:** Nnef\_DNAIMapping\_Subscribe

**Description:** This service operation is used by the consumer to subscribe for DNAI information by providing specific information of AF.

**Inputs, Required:** EAS IP/IP range and/or FQDN.

**Inputs, Optional:** DNN, S-NSSAI, geographical area.

**Outputs, Required:** When the subscription is accepted: Subscription Correlation ID, Expiry time (required if the subscription can be expired based on the operator's policy).

**Outputs, Optional:** DNAI, if available.

##### 5.2.6.x.3 Nnef\_DNAIMapping\_Unsubscribe service operation

**Service operation name:** Nnef\_DNAIMapping\_Unsubscribe

**Description:** The NF consumer unsubscribes to an existing DNAI mapping subscription.

**Inputs, Required:** Subscription Correlation ID.

**Outputs, Required:** Operation execution result indication.

##### 5.2.6.x.4 Nnef\_DNAIMapping\_UpdateNotify service operation

**Service operation name:** Nnef\_DNAIMapping\_UpdateNotify

**Description:** This service operation is used by the NEF to notify NF consumer the DNAI mapping information update due to EAS IP /IP range is changed or removed.

**Inputs, Required:** DNAI.

**Inputs, Optional:** Cause.

**Outputs, Required:** None.

## **END of CHANGES**