**3GPP TSG-SA2 Meeting #156E *S2-230xxxx***

**EMEETING, 17th – 21st April, 2023**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **23.502** | **CR** | **-** | **rev** | **-** | **Current version:** | **18.1.1** |  |
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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:***  | Subscription data and procedure modification for PIN |
|  |  |
| ***Source to WG:*** | vivo |
| ***Source to TSG:*** | SA2 |
|  |  |
| ***Work item code:*** | PIN |  | ***Date:*** | 2023-05-12 |
|  |  |  |  |  |
| ***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 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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
|  |  |
| ***Reason for change:*** | UDM/UDR needs store parameters for PIN, 5G VN group data can be externed with “PIN communication indication” for this purpose, and SMF apply configuration for PIN communication for this group. The “Application guidance for URSP determination” can be applied for the 5G VN group if the indication is included, which enables third party AF to provision URSP rules for PIN after PIN subscription has been done.One PIN can have multiple PDU Sessions of a PEGC, so the Group Data needs sub-key of <DNN, S-NSSAI> for PIN communication. |
|  |  |
| ***Summary of change:*** | 1. 5G VN group data includes “PIN communication indication”2. Application guidance for URSP determination is applicable for 5G VN group if the indication is included3. Group Data in UDR has sub-key of <DNN, S-NSSAI>4. Remove “External Group ID” from Data Key of Group Data because Group Data does not contain “External Group ID” |
|  |  |
| ***Consequences if not approved:*** | Incomplete PIN specification. |
|  |  |
| ***Clauses affected:*** | 4.15.6.3b, 4.15.6.10, 5.2.3.3.1, 5.2.12.2.1 |
|  |  |
|  | **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:*** |  |

4.15.6.3b 5G VN group data

The 5G VN group data is described in Table 4.15.6.3b-1.

**Table 4.15.6.3b-1: Description of 5G VN group data**

|  |  |
| --- | --- |
| **Parameters** | **Description** |
| DNN | DNN for the 5G VN group |
| S-NSSAI | S-NSSAI for the 5G VN group |
| PDU Session Type | PDU Session Types allowed for 5G VN group |
| Application descriptor | There may be multiple instances of this information; this information may be used to build URSP sent to 5G VN group members (NOTE 1) |
| Information related with secondary authentication / authorization | This may indicate:- the need for secondary authentication/authorization (as defined in clause 5.6 of TS 23.501 [2]);- the need for SMF to request the UE IP address from the DN-AAA Server.If at least one of secondary authentication/authorization or DN-AAA UE IP address allocation is needed, the AF may provide DN-AAA Server addressing information. |
| 5G VN group communication indication | Indicates that the 5G VN group is associated with 5G VN group communication. (NOTE 2) |
| PIN communication indication | Indicates that the 5G VN group is associated with PIN communication. (NOTE 2) |
| NOTE 1: As described in TS 23.503 [20], the PCF may be configured with a mapping from Application Descriptor to other information required to construct the URSP rules, e.g. IP filters and SSC mode.NOTE 2: The 5G VN group communication indication and PIN communication indication are mutually exclusive. |

The information described in Table 4.15.6.3b-1 corresponds to 5G VN group data that an AF may provide together with External Group ID.

\* \* \* \* 2nd change \* \* \* \*

4.15.6.10 Application guidance for URSP determination

This clause describes the procedures to allow an AF to provide guidance for URSP determination to 5G system via NEF. The AF may belong to the operator or to an external party. The PCF may be in the Home PLMN, as it is the PCF that determines the URSP for the UE, or in the VPLMN and then the Application guidance for URSP determination is provided to the PCF in the HPLMN via the PCF of the VPLMN. The PCF in the VPLMN translates the Service Parameters values provided by the AF for inbound roamer to values applicable to the HPLMN, e.g. S-NSSAI as described in TS 23.503 [20].

NOTE 1: The operator can negotiate with external party (typically a Corporate represented by an AF) dedicated DNN(s) and/or S-NSSAI(s) for the traffic of UE(s) of this external party. UE(s) of the external party can be identified by a group identifier.

The guidance for URSP determination may be used to provide 5GC with guidance for the URSPs depending on the UE location. This is further described in TS 23.548 [74].

For providing guidance for URSP determination, the procedure defined in clause 4.15.6.7 is performed with the following considerations:

1) Service Description indicates an AF Identifier.

2) Service Parameters.

 Information on the AF guidance for URSP determination which consists of a list of URSP rules that associate an application traffic descriptor with requested features for the candidate PDU sessions the application traffic may use:

- An application traffic descriptor, whose definition corresponds to that of the URSP Traffic Descriptors (as defined for the URSP rule in TS 23.503 [20] Table 6.6.2.1-2).

- one or more sets of Route selection parameters, each parameter may correspond to:

- (DNN, S-NSSAI). This may be provided by the AF or determined by the NEF based on the AF Identifier when it is not provided by the AF and the AF provides only one instance of AF guidance for URSP determination.

- Requested PDU session type.

Editor's note: It is FFS whether the AF can provide SSC mode.

- a default Route selection precedence value to be used for the application traffic when Route selection precedence with a corresponding spatial validity condition is not provided.

- Route selection precedence with a corresponding spatial validity condition that indicates where the Route selection parameters apply. This may correspond to a geographical area (e.g. a civic address or shapes).

- VPLMN ID(s) that indicates the PLMN(s) where the AF guidance on URSP determination, and all its RSD(s), applies.

NOTE 2: The different sets of Route selection parameters indicate different sets of PDU Session information (DNN, S-NSSAI) that can be associated with applications matching the application traffic descriptor. Each set is meant to apply for a specific (set of) spatial validity condition. Each set is associated with a Route selection precedence to cope with the case where multiple spatial validity conditions overlap.

If the AF provides a geographical area as spatial validity condition, it is up to the NEF to transform this information into 3GPP identifiers (e.g. TAI(s)).

NEF may, based on local configuration, complement missing service parameters. Additionally, based on operator's local policy, NEF may request UDM for service specific authorization for the service parameters for an individual UE (e.g. to authorize the Corporate or MTC provider represented by the AF and the requested DNN, S-NSSAI for the related UE) before storing the service parameters into the UDR. If the request is targeting a group of UEs, NEF may also request UDM for service specific authorization for the group related data (see table 4.15.6.3b-1), i.e. the DNN, S-NSSAI associated to the group. If the request is targeting any UE (all UEs), NEF authorizes the request based on local policy (e.g. based on AF Id) without requesting for any service specific authorization from UDM. NEF requests UDM for service specific authorization for the service parameters provisioned via the Nudm\_ServiceSpecificAuthorisation\_Create service operation as defined in clause 4.15.6.7a.

If a group of UEs or any UE is requested, each individual UE authorization is performed at a later stage by PCF.

NOTE 3: The operator needs to ensure the consistency between the group related data and the UE group members subscription data, i.e. if a group is authorized for a given DNN/S-NSSAI as defined in the group related data, it needs to be ensured that all UE members of the group are provisioned with such DNN/S-NSSAI, since no individual UE check is required to be done by NEF against UDM.

NOTE 4: AF guidance for traffic from application (not traffic for PIN) is not related with 5G VN group.

3) The Target UE identifier(s) that may be a specific UE, identified by a GPSI, or a group of UE(s), identified by an External-Group-ID, or any UE of the PLMN of the NEF, or the PLMN ID(s) of inbound roamers that the AF request may be associated with.

 The information on the AF guidance for URSP determination provided by the AF may be associated to:

a) UEs of the PLMN (of the NEF) when roaming in other PLMNs. In this case, the AF guidance for URSP determination targets to a specific UE, a group of UEs or any UE of the PLMN. In this case, the AF guidance for URSP determination associated to a specific UE, a group of UEs or any UE of the PLMN shall be also associated with the corresponding VPLMN(s) where the AF guidance for URSP determination shall be applied if the UE roams to that VPLMN(s). The list of VPLMN ID(s) is included in the Service Parameters.

b) An inbound roamer from one or more PLMN(s). In this case, the AF targets the AF guidance for URSP determination only with the inbound roamers of corresponding PLMN(s). The PLMN ID is included in the Service Parameters.

NOTE 5: Wildcarding of "PLMN ID of inbound roamers" will be handled by stage 3.

4) Subscription to events.

 The AF may subscribe to notifications about the outcome of the UE Policies delivery due to application guidance for URSP determination.

The usage of the AF guidance for application traffic is described in clause 6.2.4 in TS 23.548 [74].

\* \* \* \* 3rd change \* \* \* \*

5.2.3.3.1 General

Subscription data types used in the Nudm\_SubscriberDataManagement Service are defined in Table 5.2.3.3.1-1 below.

**Table 5.2.3.3.1-1: UE Subscription data types**

| **Subscription data type** | **Field** | **Description** |
| --- | --- | --- |
| Access and Mobility Subscription data (data needed for UE | GPSI List | List of the GPSI (Generic Public Subscription Identifier) used both inside and outside of the 3GPP system to address a 3GPP subscription (see NOTE 9). |
| Registration and Mobility Management) | Internal Group ID-list | List of the subscribed internal group(s) that the UE belongs to. |
|  | Subscribed UE-AMBR | The maximum aggregated uplink and downlink MBRs to be shared across all Non-GBR QoS Flows according to the subscription of the user. |
|  | Subscribed UE-Slice-MBR(s) | List of maximum aggregated uplink and downlink MBRs to be shared across all GBR and Non-GBR QoS Flows related to the same S-NSSAI according to the subscription of the user. There is a single uplink and a single downlink value per S-NSSAI. |
|  | Subscribed S-NSSAIs | The Network Slices that the UE subscribes to. In the roaming case, it indicates the subscribed Network Slices applicable to the Serving PLMN (NOTE 11). |
|  | Default S-NSSAIs | The Subscribed S-NSSAIs marked as default S-NSSAI. In the roaming case, only those applicable to the Serving PLMN (NOTE 12). |
|  | S-NSSAIs subject to Network Slice-Specific Authentication and Authorization | The Subscribed S-NSSAIs marked as subject to NSSAA. When present, the GPSI list shall include at least one GPSI. |
|  | Network Slice Simultaneous Registration Group Information | Optionally, for each S-NSSAI in the Subscribed S-NSSAIs, one or more value of Network Slice Simultaneous Registration Group(s) (NOTE 11) associated with the S-NSSAI. |
|  | UE Usage Type | As defined in clause 5.15.7.2 of TS 23.501 [2]. |
|  | RAT restriction | 3GPP and non-3GPP Radio Access Technology(ies) not allowed the UE to access. |
|  | Forbidden area | Defines areas in which the UE is not permitted to initiate any communication with the network. |
|  | Service Area Restriction | Indicates Allowed Areas in which the UE is permitted to initiate communication with the network and Non-allowed areas in which the UE and the network are not allowed to initiate Service Request or SM signalling to obtain user services. |
|  | Core Network type restriction | Defines whether UE is allowed to connect to 5GC and/or EPC for this PLMN. |
|  | CAG information | The CAG information includes Allowed CAG list and, optionally an indication whether the UE is only allowed to access 5GS via CAG cells as defined in clause 5.30.3 of TS 23.501 [2]. Optionally, time duration restriction and/or location restriction information indicating when and/or where the UE can access the CAG cells. Each entry in the Allowed CAG list may also be associated with validity conditions. |
|  | CAG information Subscription Change Indication | When present, indicates to the serving AMF that the CAG information in the subscription data changed and the UE must be updated. |
|  | RFSP Index | An index to specific RRM configuration in the NG-RAN. |
|  | Subscribed Periodic Registration Timer | Indicates a subscribed Periodic Registration Timer value, which may be influenced by e.g. network configuration parameter as specified in clause 4.15.6.3a. |
|  | Subscribed Active Time | Indicates a subscribed active time value, which may be influenced by e.g. network configuration parameter as specified in clause 4.15.6.3a. |
|  | MPS priority | Indicates the user is subscribed to MPS as indicated in clause 5.16.5 of TS 23.501 [2]. |
|  | MCX priority | Indicates the user is subscribed to MCX as indicated in clause 5.16.6 of TS 23.501 [2]. |
|  | AMF-Associated Expected UE Behaviour parameters | Information on expected UE movement and communication characteristics. See clause 4.15.6.3 |
|  | Steering of Roaming | List of preferred PLMN/access technology combinations and/or Credentials Holder controlled prioritized lists of preferred SNPNs and GINs (see NOTE 21) or HPLMN/Credentials Holder indication that no change of the above list(s) stored in the UE is needed (see NOTE 3).Optionally includes an indication that the UDM requests an acknowledgement of the reception of this information from the UE. |
|  | SoR Update Indicator for Initial Registration | An indication whether the UDM requests the AMF to retrieve SoR information when the UE performs Registration with NAS Registration Type "Initial Registration". |
|  | SoR Update Indicator for Emergency Registration | An indication whether the UDM requests the AMF to retrieve SoR information when the UE performs Registration with NAS Registration Type "Emergency Registration". |
|  | Network Slicing Subscription Change Indicator | When present, indicates to the serving AMF that the subscription data for network slicing changed and the UE configuration must be updated. |
|  | Provide the UE with the full set of subscribed S-NSSAIs | Indicates the AMF to provide the UE with the full set of subscribed S-NSSAIs even if they do not share a common NSSRG. |
|  | Tracing Requirements | Trace requirements about a UE (e.g. trace reference, address of the Trace Collection Entity, etc.) is defined in TS 32.421 [39]. |
|  | Inclusion of NSSAI in RRC Connection Establishment Allowed | When present, it is used to indicate that the UE is allowed to include NSSAI in the RRC connection Establishment in clear text for 3GPP access. |
|  | Service Gap Time | Used to set the Service Gap timer for Service Gap Control (see clause 5.31.16 of TS 23.501 [2]). |
|  | Subscribed DNN list | List of the subscribed DNNs for the UE (NOTE 1). Used to determine the list of LADN available to the UE as defined in clause 5.6.5 of TS 23.501 [2]. |
|  | UDM Update Data | Includes a set of parameters see clause 4.20.1 for parameters possible to deliver) to be delivered from UDM to the UE via NAS signalling as defined in clause 4.20 (NOTE 3).Optionally includes an indication that the UDM requests an acknowledgement of the reception of this information from the UE and an indication for the UE to re-register. |
|  | NB-IoT UE priority | Numerical value used by the NG-RAN to prioritise between UEs accessing via NB-IoT. |
|  | Enhanced Coverage Restriction | Specifies whether CE mode B is restricted for the UE, or both CE mode A and CE mode B are restricted for the UE, or both CE mode A and CE mode B are not restricted for the UE. |
|  | NB-IoT Enhanced Coverage Restriction | Indicates whether Enhanced Coverage for NB-IoT UEs is restricted or not. |
|  | IAB-Operation allowed | Indicates that the subscriber is allowed for IAB-operation as specified in clause 5.35.2 of TS 23.501 [2]. |
|  | Charging Characteristics | It contains the Charging Characteristics as defined in Annex A of TS 32.256 [71].This information, when provided, shall override any corresponding predefined information at the AMF. |
|  | Extended idle mode DRX cycle length | Indicates a subscribed extended idle mode DRX cycle length value. |
|  | PCF Selection Assistance info | list of combination of DNN and S-NSSAI that indicates that the same PCF needs to be selected for AM Policy Control and SM Policy Control (NOTE 10). |
|  | AerialUESubscriptionInfo | Aerial UE Subscription Information. It contains an Indication on whether Aerial service for the UE is allowed or not. |
|  | 5G Access Stratum-based Time Synchronization Service Data | Includes the Access Stratum Time Synchronization Service Authorization to indicate whether the UE should be provisioned with 5G system internal clock timing information over access stratum.Optionally includes an Uu time synchronization error budget.Optionally includes one or more periods of start and stop times defining the times when the UE should be provisioned with 5G system internal clock timing information.Optionally includes a Time Synchronization Coverage Area comprising a list of TAs where the UE shall be provisioned with 5G system internal clock timing information (NOTE 19).Optionally includes a clock quality detail level to indicate whether and which clock quality information to provide to the UE. It comprises one of the following values: clock quality metrics or acceptable/not acceptable indication.Optionally includes the clock quality acceptance criteria for the UE. It may be defined based on one or more of the following attributes: time source, traceability to UTC and to GNSS, synchronization state, clock accuracy, frequency stability. |
|  | Routing Indicator | Routing Indicator assigned to the SUPI. |
| Slice Selection Subscription data (data needed for  | Subscribed S-NSSAIs | The Network Slices that the UE subscribes to. In roaming case, it indicates the subscribed network slices applicable to the serving PLMN (NOTE 11). |
| Slice Selection as described in clause 4.2.2.2.3 and | Default S-NSSAIs | The Subscribed S-NSSAIs marked as default S-NSSAI. In the roaming case, only those applicable to the Serving PLMN (NOTE 12). |
| in clause 4.11.0a.5) | S-NSSAIs subject to Network Slice-Specific Authentication and Authorization | The Subscribed S-NSSAIs marked as subject to NSSAA. |
|  | Network Slice Simultaneous Registration Group (NSSRG) Information | Optionally, for each S-NSSAI in the Subscribed S-NSSAIs, the one or more value of Network Slice Simultaneous Registration Group(s) (NOTE 11) associated with the S-NSSAI. |
| SMF Selection | SUPI | Key |
| Subscription data (data needed for SMF | **SMF Selection Subscription data contains one or more S-NSSAI level subscription data:** |
| Selection as described | S-NSSAI | Indicates the value of the S-NSSAI. |
| in clause 6.3.2 of | Subscribed DNN list | List of the subscribed DNNs for the UE (NOTE 1). |
| TS 23.501 [2]) | Default DNN | The default DNN if the UE does not provide a DNN (NOTE 2). |
|  | DNN(s) subject to aerial services | List of DNNs that are used for aerial services (e.g. UAS operations or C2, etc.) as described in TS 23.256 [80]. (see NOTE 13). |
|  | LBO Roaming Information | Indicates whether LBO roaming is allowed per DNN, or per (S-NSSAI, subscribed DNN). (NOTE 16) |
|  | HR-SBO allowed indication | Indicates whether Session Breakout for HR Session using ULCL/BP in VPLMN is allowed per DNN, or per (S-NSSAI, subscribed DNN).(NOTE 17) |
|  | Interworking with EPS indication list | Indicates whether EPS interworking is supported per (S-NSSAI, subscribed DNN). |
|  | Same SMF for Multiple PDU Sessions to the same DNN and S-NSSAI | Indication whether the same SMF for multiple PDU Sessions to the same DNN and S-NSSAI is required. |
|  | Invoke NEF indication | When present, indicates, per S-NSSAI and per DNN, that NEF based infrequent small data transfer shall be used for the PDU Session (see NOTE 8). |
|  | SMF information for static IP address/prefix | When static IP address/prefix is used, this may be used to indicate the associated SMF information per (S-NSSAI, DNN). |
| UE context in SMF | SUPI | Key. |
| data | PDU Session Id(s) | List of PDU Session Id(s) for the UE. |
|  | **For emergency PDU Session Id:** |
|  | Emergency Information | The SMF+PGW-C FQDN for emergency session used for interworking with EPC. |
|  | **For each non-emergency PDU Session Id:** |
|  | DNN | DNN for the PDU Session. |
|  | SMF | Allocated SMF for the PDU Session. Includes SMF IP Address and SMF NF Id. |
|  | SMF+PGW-C FQDN | The S5/S8 SMF+PGW-C FQDN used for interworking with EPS (see NOTE 5). |
|  | PCF ID | The PCF ID serving the PDU Session/PDN Connection. |
| SMS Management Subscription data (data needed by | SMS parameters | Indicates SMS parameters subscribed for SMS service such as SMS teleservice, SMS barring list |
| SMSF for SMSF Registration) | Trace Requirements | Trace requirements about a UE (e.g. trace reference, address of the Trace Collection Entity, etc.) is defined in TS 32.421 [39].This information is only sent to a SMSF in HPLMN. |
|  | Routing Indicator | Routing Indicator assigned to the SUPI. |
| SMS Subscription data | SMS Subscription | Indicates subscription to any SMS delivery service over NAS irrespective of access type. |
| (data needed in AMF) |  |  |
| UE Context in SMSF data | SMSF Information | Indicates SMSF allocated for the UE, including SMSF address and SMSF NF ID. |
|  | Access Type | 3GPP or non-3GPP access through this SMSF |
| Session Management Subscription data (data needed for PDU | GPSI List | List of the GPSI (Generic Public Subscription Identifier) used both inside and outside of the 3GPP system to address a 3GPP subscription. |
| Session Establishment) | Internal Group ID-list | List of the subscribed internal group(s) that the UE belongs to. |
|  | Trace Requirements | Trace requirements about a UE (e.g. trace reference, address of the Trace Collection Entity, etc…) is defined in TS 32.421 [39].This information is only sent to a SMF in the HPLMN or one of its equivalent PLMN(s). |
|  | Routing Indicator | Routing Indicator assigned to the SUPI. |
|  | **Session Management Subscription data contains one or more S-NSSAI level subscription data:** |
|  | S-NSSAI | Indicates the value of the S-NSSAI. |
|  | Subscribed DNN list | List of the subscribed DNNs for the S-NSSAI (NOTE 1). |
|  | **For each DNN in S-NSSAI level subscription data:** |
|  | DNN | DNN for the PDU Session. |
|  | Aerial service indication | Indicates whether the DNN is used for aerial services (e.g. UAS operations or C2, etc.) as described in TS 23.256 [80]. |
|  | Framed Route information | Set of Framed Routes. A Framed Route refers to a range of IPv4 addresses / IPv6 Prefixes to associate with a PDU Session established on this (DNN, S-NSSAI).See NOTE 4. |
|  | IP Index information | Information used for selecting how the UE IP address is to be allocated (see clause 5.8.2.2.1 in TS 23.501 [2]). |
|  | Allowed PDU Session Types | Indicates the allowed PDU Session Types (IPv4, IPv6, IPv4v6, Ethernet and Unstructured) for the DNN, S-NSSAI. See NOTE 6. |
|  | Default PDU Session Type | Indicates the default PDU Session Type for the DNN, S-NSSAI. |
|  | Allowed SSC modes | Indicates the allowed SSC modes for the DNN, S-NSSAI. |
|  | Default SSC mode | Indicate the default SSC mode for the DNN, S-NSSAI. |
|  | Interworking with EPS indication | Indicates whether interworking with EPS is supported for this DNN and S-NSSAI. |
|  | 5GS Subscribed QoS profile | The QoS Flow level QoS parameter values (5QI and ARP) for the DNN, S-NSSAI (see clause 5.7.2.7 of TS 23.501 [2]). |
|  | Charging Characteristics | It contains Charging Characteristics as defined in Annex A clause A.1 of TS 32.255 [45]. This information, when provided, shall override any corresponding predefined information at the SMF. |
|  | Subscribed-Session-AMBR | The maximum aggregated uplink and downlink MBRs to be shared across all Non-GBR QoS Flows in each PDU Session, which are established for the DNN, S-NSSAI. |
|  | Static IP address/prefix | Indicate the static IP address/prefix for the DNN, S-NSSAI. |
|  | User Plane Security Policy | Indicates the security policy for integrity protection and encryption for the user plane. |
|  | PDU Session continuity at inter RAT mobility | Provides for this DDN, S-NSSAI how to handle a PDU Session when UE the moves to or from NB-IoT. Possible values are: maintain the PDU session; disconnect the PDU session with a reactivation request; disconnect PDU session without reactivation request; or to leave it to local VPLMN policy. |
|  | NEF Identity for NIDD | When present, indicates, per S-NSSAI and per DNN, the identity of the NEF to anchor Unstructured PDU Session. When not present for the S-NSSAI and DNN, the PDU session terminates in UPF (see NOTE 8). |
|  | NIDD information | Information such as External Group Identifier, External Identifier, MSISDN, or AF Identifier used for SMF-NEF Connection. |
|  | SMF-Associated Expected UE Behaviour parameters | Parameters on expected characteristics of a PDU Session their corresponding validity times as specified in clause 4.15.6.3. |
|  | Suggested number of downlink packets | Parameters on expected PDU session characteristics as specified in clauses 4.15.3.2.3b and 4.15.6.3a. |
|  | ATSSS information | Indicates whether MA PDU session establishment is allowed. |
|  | Secondary authentication indication | Indicates that whether the Secondary authentication/authorization (as defined in clause 5.6 of TS 23.501 [2]) is required for PDU Session Establishment or PDN Connection Establishment as specified in clause 4.3.2.3 and clause H.2. (see NOTE 14) |
|  | DN-AAA Server UE IP address allocation indication | Indicates that whether the SMF is required to request the UE IP address from the DN-AAA Server (as defined in clause 5.6 of TS 23.501 [2]) for PDU Session Establishment or or PDN Connection Establishment as specified in clause 4.3.2.3 and clause H.2. |
|  | DN-AAA Server addressing information | If at least one of secondary DN-AAA authentication, DN-AAA authorization or DN-AAA UE IP address allocation is required by subscription data, the subscription data may also contain DN-AAA Server addressing information. |
|  | Edge Configuration Server Address Configuration Information | Consists of one or more ECS Configuration Information as defined in clause 8.3.2.1 of TS 23.558 [83]. The ECS Configuration Information sent by UDM to SMF is associated with the PLMN ID where the UE is roaming on. (see NOTE 20) |
|  | API based secondary authentication indication | Indicates that whether the API based Secondary authentication/authorization (as defined in clause 5.2.3 of TS 23.256 [80]) is required for PDU Session Establishment or PDN Connection Establishment as specified in clause 4.3.2.3 and clause H.2 (see NOTE 14). |
|  | UE authorization for EAS discovery via EASDF | Indicates whether the UE is authorized to use 5GC assisted EAS discovery via EASDF (as defined in TS 23.548 [74]). |
|  | HR-SBO authorization indication | Indicates whether the VPLMN is authorized for Home Routed Session Breakout (HR-SBO) (see NOTE 17 and NOTE 18). |
| Identifier translation | SUPI | Corresponding SUPI for input GPSI. |
|  | (Optional) MSISDN | Corresponding GPSI (MSISDN) for input GPSI (External Identifier). This is optionally provided for legacy SMS infrastructure not supporting MSISDN-less SMS. The presence of an MSISDN should be interpreted as an indication to the NEF that MSISDN shall be used to identify the UE when sending the SMS to the SMS-SC via T4. |
|  | GPSI | Corresponding GPSI for input SUPI and associated application information (e.g. Application Port ID) (NOTE 15). |
| Intersystem continuity Context | (DNN, PGW FQDN) list | For each DNN, indicates the SMF+PGW-C which support interworking with EPC. |
| LCS privacy(data needed by GMLC) | LCS privacy profile data | Provides information for LCS privacy classes and Location Privacy Indication (LPI) as defined in clause 5.4.2 in TS 23.273 [51] |
| LCS mobile origination(data needed by AMF) | LCS Mobile Originated Data | When present, indicates to the serving AMF which LCS mobile originated services are subscribed as defined in clause 7.1 in TS 23.273 [51]. |
| User consent (see TS 23.288 [50]) | User consent for UE data collection | Indicates whether the user has given consent for collecting, distributing and analysing UE related data. User consent is provided per purpose (e.g. analytics, model training). |
| UE reachability | UE reachability information | Provides, per PLMN, the list of NF IDs or the list of NF sets or the list of NF types authorized to request notification for UE's reachability (NOTE 7). |
| V2X Subscription data (see TS 23.287 [73]) | NR V2X Services Authorization | Indicates whether the UE is authorized to use the NR sidelink for V2X services as Vehicle UE, Pedestrian UE, or both. |
|  | LTE V2X Services Authorization | Indicates whether the UE is authorized to use the LTE sidelink for V2X services as Vehicle UE, Pedestrian UE, or both. |
|  | NR UE-PC5-AMBR | AMBR of UE's NR sidelink (i.e. PC5) communication for V2X services. |
|  | LTE UE-PC5-AMBR | AMBR of UE's LTE sidelink (i.e. PC5) communication for V2X services. |
| A2X Subscription data (see TS 23.256 [80]) | NR A2X Services Authorization | Indicates whether the UE is authorized to use the NR sidelink for A2X services. |
|  | LTE A2X Services Authorization | Indicates whether the UE is authorized to use the LTE sidelink for A2X services. |
|  | NR UE-PC5-AMBR for A2X | AMBR of UE's NR sidelink (i.e. PC5) communication for A2X services. |
|  | LTE UE-PC5-AMBR for A2X | AMBR of UE's LTE sidelink (i.e. PC5) communication for A2X services. |
| ProSe Subscription data (see TS 23.304 [77]) | ProSe Service Authorization | Indicates whether the UE is authorized to: use ProSe Direct Discovery, use ProSe Direct Communication, use both ProSe Direct Discovery and ProSe Direct Communication, use or serve as a ProSe UE-to-Network Relay and use multiple-path transmission via direct Uu path and via 5G ProSe Layer-2 UE-to-Network Relay as a 5G ProSe Layer-2 Remote UE. |
|  | ProSe NR UE-PC5-AMBR | AMBR of UE's NR sidelink (i.e. PC5) communication for ProSe services. |
| MBS Subscription data (see TS 23.247 [78]) | MBS Service Authorization | Indicates whether the UE is authorized to use Multicast MBS service. May also indicate the multicast MBS Session which the UE is allowed to join if the UE is authorized to use multicast MBS Service. |
| Time Synchronization Subscription data (see clause 5.27.1.11 of TS 23.501 [2]) | AF Request Authorization Information | Includes the AF Request Authorization to indicate whether the UE is authorized for an AF-requested 5G access stratum-based time distribution and (g)PTP-based time distribution services. The indication is provided separately for each service.Optionally includes a list of TA(s) which specifies the Authorized Time Synchronization Coverage Area in which an AF may request time synchronization services (NOTE 19). |
|  | Subscribed Time Synchronization Service ID(s) | Each containing the DNN/S-NSSAI and a reference to a PTP instance configuration pre-configured at the TSCTSF.Optionally, for each PTP instance configuration, one or more periods of start and stop times defining active times of time synchronization service for the PTP instance.Optionally, for each PTP instance configuration, a Time Synchronization Coverage Area defining a list of TAs where the (g)PTP-based time synchronization is available for the UEs in the PTP instance (NOTE 19). |
| NOTE 1: The Subscribed DNN list can include a wildcard DNN.NOTE 2: The default DNN shall not be a wildcard DNN.NOTE 3: The Steering of Roaming information and UDM Update Data are protected using the mechanisms defined in TS 33.501 [15].NOTE 4: Framed Route information and Framed Route(s) are defined in TS 23.501 [2].NOTE 5: Depending on the scenario PGW-C FQDN may be for S5/S8, or for S2b (ePDG case).NOTE 6: The Allowed PDU Session Types configured for a DNN which supports interworking with EPC should contain only the PDU Session Type corresponding to the PDN Type configured in the APN that corresponds to the DNN.NOTE 7: Providing a list of NF types or a list of NF sets may be more appropriate for some deployments, e.g. in highly dynamic NF lifecycle management deployments.NOTE 8: For a S-NSSAI and a DNN, the "Invoke NEF Indication" shall be present in the SMF selection subscription data if and only if the "NEF Identity for NIDD" Session Management Subscription Data includes a NEF Identity. When the "NEF Identity for NIDD" Session Management Subscription Data includes a NEF Identity for a S-NSSAI and DNN, the "Control Plane Only Indicator" will always be set for PDU Sessions to this S-NSSAI and DNN (see clause 5.31.4.1 of TS 23.501 [2]).NOTE 9: When multiple GPSIs are included in the GPSI list, any GPSI in the list can be used in NSSAA procedures.NOTE 10: The same PCF can be selected to serve the UE and to serve one or multiple PDU sessions, each of them is indicated in the list of S-NSSAI, DNN combinations in the PCF Selection Assistance Info. Providing one combination of DNN and S-NSSAI in the PCF Selection Assistance Info is assumed if interworking with EPS is needed. In case multiple PDU sessions to one DNN, S-NSSAI are established in EPS, it is appropriate to select same PCF by configuration or by using existing method, e.g. same PCF selection in usage monitoring.NOTE 11: If Network Slice Simultaneous Registration Group information is present and the VPLMN does not support the subscription-based restrictions to simultaneous registration of network slices, the subset of the Subscribed S-NSSAIs defined in clause 5.15.12 of TS 23.501 [2], are included, without providing the NSSRG information.NOTE 12: The Default S-NSSAIs (if more than one is present) are associated with common NSSRG values if NSSRG information is present. At least one Default S-NSSAI shall be present in a subscription including NSSRG information.NOTE 13: When UUAA is performed in the AMF (as in clause 5.2.2 of TS 23.256 [80]) and UUAA-MM status is FAILED or PENDING, the AMF shall reject PDU session establishment requests from the UE for a DNN that is subject to aerial services.NOTE 14: For a DNN in S-NSSAI either a DN-AAA based secondary authentication, or an API based secondary authentication can be configured. When API based authentication of the PDU session is required, Secondary authentication indication shall not be present.NOTE 15: A GPSI may be associated with Application Port ID, MTC Provider Information and/or AF Identifier.NOTE 16: For non-roaming UE (e.g. accessing SNPN with CH credentials), LBO roaming information does not apply.NOTE 17: This information applies only for HR PDU Session.NOTE 18: This information is only valid for the current serving network.NOTE 19: The subscribed Time Synchronization Coverage Area shall be inside of the Allowed Areas as per UE's service area restriction.NOTE 20: For roaming UE in a visited PLMN, the corresponding PLMN ID is provided with Edge Configuration Server (ECS) Address Configuration Information.NOTE 21: The entries in the Credentials Holder controlled prioritized lists of preferred SNPNs and GINs may be associated with a time validity or/and location validity condition as specified in clause 5.30.2.3 of TS 23.501 [2]. |

Editor's note: Whether the Credentials Holder controlled prioritized lists of preferred SNPNs/GINs can be extended or if a new list type is to be defined to provide entries with validity information to the UE is FFS and to be determined by CT WG1.

**Table 5.2.3.3.1-2: Group Subscription data types**

| **Subscription data type** | **Field** | **Description** |
| --- | --- | --- |
| Group Identifier translation | External Group Identifier | Identifies external group of UEs that the UE belongs to as defined in TS 23.682 [23]. |
|  | Internal Group Identifier | Identifies internal group of UEs that the UE belongs to as defined in TS 23.501 [2]. |
|  | SUPI list | Corresponding SUPI list for input External Group Identifier. |
| Group Data(NOTE 1) | Internal Group Identifier | Internal identifiers of the group of UEs that the Group Data belongs to. |
|  | Group data | In the case of 5G VN related groups the content of this information is defined in clause 4.15.6.3b. |
| NOTE 1: Group Data within Group Subscription Data can be managed using the Shared Data feature defined in TS 29.503 [52]. In that case, Shared Data is identified using Shared Data identifier and can contain additional information than the one defined in this table. |

At least a mandatory key is required for each Subscription Data Type to identify the corresponding data. Depending on the use case, for some Subscription Data Types it is possible to use one or multiple sub keys to further identify the corresponding data, as defined in Tables 5.2.3.3.1-3 and 5.2.3.3.1-4 below.

**Table 5.2.3.3.1-3: UE Subscription data types keys**

|  |  |  |
| --- | --- | --- |
| **Subscription Data Types** | **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 | S-NSSAI |
| SMS Management Subscription data  | SUPI | Serving PLMN ID and optionally NID |
| SMS Subscription data | SUPI | Serving PLMN ID and optionally NID |
| UE Context in SMSF data | SUPI | - |
| Session Management Subscription data | SUPI | S-NSSAI |
|  |  | DNN |
|  |  | Serving PLMN ID and optionally NID |
| Identifier translation | GPSI | - |
|  | SUPI | Application Port ID, MTC Provider Information, AF Identifier |
| Slice Selection Subscription data | SUPI | Serving PLMN ID and optionally NID |
| Intersystem continuity Context | SUPI | DNN |
| LCS privacy | SUPI | - |
| LCS mobile origination | SUPI | - |
| User consent | SUPI | Purpose |
| UE reachability | SUPI | - |
| V2X Subscription data | SUPI | - |
| ProSe Subscription data | SUPI | - |
| MBS Subscription data | SUPI | - |
| A2X Subscription data | SUPI | - |

**Table 5.2.3.3.1-4: Group Subscription data types keys**

|  |  |  |
| --- | --- | --- |
| **Subscription Data Types** | **Data Key** | **Data Sub Key** |
| Group Identifier translation | External Group Identifier | - |
|  | Internal Group Identifier | - |
| Group Data | Internal Group Identifier | S-NSSAI |
|  |  | DNN |

Wireline access specific subscription data parameters are specified in TS 23.316 [53].

\* \* \* \* 4th change \* \* \* \*

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 | S-NSSAI |
|  |  |  | DNN |
|  | 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 orExternal Group Identifier | - |
|  | UE context in SMSF data | SUPI | - |
|  | V2X Subscription data | SUPI | - |
|  | A2X 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, (Serving) PLMN ID (NOTE 7) |
|  | MBS Subscription data | SUPI | - |
|  | Shared data | Shared Data ID | - |
| Application data | Packet Flow Descriptions (PFDs) | Application Identifier | - |
|  | AF traffic influence request information for traffic routing | AF transaction internal ID |  |
|  | (See clause 5.6.7 and clause 6.3.7.2 of TS 23.501 [2]) | S-NSSAI and DNNand/orInternal Group Identifier(s) and/or Subscriber Category(s) or SUPI or "any UE" indication (NOTE 4) (NOTE 6) |  |
|  | AF traffic influence request information for service function chaining | AF transaction internal ID |  |
|  | (See clause 5.6.16 and clause 6.3.7.2 of TS 23.501 [2]) | S-NSSAI and DNNand/orInternal 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 DNNorInternal Group Identifier or SUPI or "any UE" indication (NOTE 4) or "PLMN ID(s) of inbound roamer" |  |
|  | 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 DNNand/orInternal Group Identifier or SUPI or "any UE" indication (NOTE 4) |  |
|  | AF request for QoS information (See clause 4.15.6.14) | AF transaction internal ID |  |
|  |  | S-NSSAI and DNNand/orInternal 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 | DNN and/or S-NSSAI |  |
| 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.NOTE 6: If a list of Internal Group IDs is used, the AF traffic influence request information request applies to the UEs that belong to every one of these groups, i.e. a single UE needs to be a member of every group in the list of Internal Group IDs.NOTE 7: When the Data Key targets "PLMN ID", then the request to UDR applies on subscription data about subscribers roaming in this PLMN. |

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.

Editor's note: Related to the DNAI mapping information, it is FFS whether and how UDR is used (e.g. How UDR data is to be structured).

\* \* \* \* End of change \* \* \* \*