**3GPP TSG-WG SA2 Meeting # 164 *S2-2409063***

**Maastricht, NL, 19 - 23 August 2024 (revision of S2-2408781)**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **23.502** | **CR** | **4913** | **rev** | **2** | **Current version:** | **19.0.0** |  |
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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:*** | MPS support for MO and MT SMS over NAS procedures | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson, Peraton Labs, Nokia, Samsung, CISA ECD | | | | | | | | | |
| ***Source to TSG:*** | SA2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | MPS4msg | | | | |  | ***Date:*** | | | 2024-08-23 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | B |  | | | | | ***Release:*** | | | Rel-19 |
|  | *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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | MPS support for MO and MT SMS procedures based on the outcome of the study for FS\_MPS4msg. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Following procedures are updated to handling the MPS priority for SMS   1. Registration procedure in clause 4.2.2.2.2. 2. Registration proceudre for SMS over NAS in clause 4.13.3.1 3. MO SMS over NAS in CM-IDLE procedure in clause 4.13.3.3 4. MT SMS over NAS in CM-IDLE and RRC\_INACTIVE in clause 4.13.3.6   Subscription data update to include the MPS priority for the SMS. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Missing funcitions | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.2.2.2.2, 4.13.3.1, 4.13.3.3, 4.13.3.6, 5.2.3.3.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

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

##### 4.2.2.2.2 General Registration



Figure 4.2.2.2.2-1: Registration procedure

1. UE to (R)AN: AN message (AN parameters, Registration Request (Registration type, SUCI or 5G-GUTI or PEI, [last visited TAI (if available)], Security parameters, [Requested NSSAI], [Mapping Of Requested NSSAI], [Default Configured NSSAI Indication], [UE Radio Capability Update], [UE MM Core Network Capability], [PDU Session status], [List Of PDU Sessions To Be Activated], [Follow-on request], [MICO Indication], [Requested Active Time], [Requested DRX parameters for E-UTRA and NR], [Requested DRX parameters for NB-IoT], [extended idle mode DRX parameters], [LADN DNN(s) or Indicator Of Requesting LADN Information], [NAS message container], [Support for restriction of use of Enhanced Coverage], [Preferred Network Behaviour], [UE paging probability information], [Paging Subgrouping Support Indication], [UE Policy Container (the list of PSIs, indication of UE support for ANDSP, the operating system identifier, Indication of URSP Provisioning Support in EPS, UE capability of reporting URSP rule enforcement to network, UE capability of supporting VPLMN-specific URSP rules)] and [UE Radio Capability ID], [Release Request indication], [Paging Restriction Information], PEI, [PLMN with Disaster Condition], [Requested Periodic Update time], [Unavailability Period Duration], [Start of Unavailability Period], [Unavailability Type])).

NOTE 1: The UE Policy Container and its usage is defined in TS 23.503 [20].

In the case of NG-RAN, the AN parameters include e.g. 5G-S-TMSI or GUAMI, the Selected PLMN ID (or PLMN ID and NID, see clause 5.30 of TS 23.501 [2]) and NSSAI information, the AN parameters also include Establishment cause. The Establishment cause provides the reason for requesting the establishment of an RRC connection. Whether and how the UE includes the NSSAI information as part of the AN parameters is dependent on the value of the Access Stratum Connection Establishment NSSAI Inclusion Mode parameter, as specified in clause 5.15.9 of TS 23.501 [2].

The AN parameters shall also include an IAB-Indication if the UE is an IAB-node accessing 5GS.

The AN parameters shall also include a MBSR Indication if the UE is part of an MBSR node accessing 5GS attempting MBSR operation in the PLMN as specified in clause 5.35A.1 of TS 23.501 [2].

The Registration type indicates if the UE wants to perform an Initial Registration (i.e. the UE is in RM-DEREGISTERED state), a Mobility Registration Update (i.e. the UE is in RM-REGISTERED state and initiates a Registration procedure due to mobility or due to the UE needs to update its capabilities or protocol parameters, or to request a change of the set of network slices it is allowed to use), a Periodic Registration Update (i.e. the UE is in RM-REGISTERED state and initiates a Registration procedure due to the Periodic Registration Update timer expiry, see clause 4.2.2.2.1), an Emergency Registration (i.e. the UE is in limited service state), a Disaster Roaming Initial Registration, or a Disaster Roaming Mobility Registration Update.

When the UE is using E-UTRA, the UE indicates its support of CIoT 5GS Optimisations, which is relevant for the AMF selection, in the RRC connection establishment signalling associated with the Registration Request.

When the UE is performing an Initial Registration or a Disaster Roaming Registration the UE shall indicate its UE identity in the Registration Request message as follows, listed in decreasing order of preference in the case of registration with a PLMN:

i) a 5G-GUTI mapped from an EPS GUTI, if the UE has a valid EPS GUTI.

ii) a native 5G-GUTI assigned by the PLMN to which the UE is attempting to register, if available;

iii) a native 5G-GUTI assigned by an equivalent PLMN to the PLMN to which the UE is attempting to register, if available;

iv) a native 5G-GUTI assigned by any other PLMN, if available; or

NOTE 2: This can also be a 5G-GUTIs assigned via another access type.

v) Otherwise, the UE shall include its SUCI in the Registration Request as defined in TS 33.501 [15].

If the UE is registering with an SNPN, when the UE is performing an Initial Registration the UE shall indicate its UE identity in the Registration Request message as follows, listed in decreasing order of preference:

i) a native 5G-GUTI assigned by the same SNPN to which the UE is attempting to register, if available;

ii) a native 5G-GUTI assigned by an equivalent SNPN to the SNPN to which the UE is attempting to register along with the NID of the SNPN that assigned the 5G-GUTI, if available;

iii) a native 5G-GUTI assigned by any other SNPN along with the NID of the SNPN that assigned the 5G-GUTI, if available; or

iv) Otherwise, the UE shall include its SUCI in the Registration Request as defined in TS 33.501 [15].

When the UE performing an Initial Registration has both a valid EPS GUTI and a native 5G-GUTI, the UE shall also indicate the native 5G-GUTI as Additional GUTI. If more than one native 5G-GUTIs are available, the UE shall select the 5G-GUTI in decreasing order of preference among items (ii)-(iv) in the list above.

The NAS message container shall be included if the UE is sending a Registration Request message as an Initial NAS message and the UE has a valid 5G NAS security context and the UE needs to send non-cleartext IEs, see clause 4.4.6 of TS 24.501 [25]. If the UE does not need to send non-cleartext IEs, the UE shall send a Registration Request message without including the NAS message container.

If the UE does not have a valid 5G NAS security context, the UE shall send the Registration Request message without including the NAS message container. The UE shall include the entire Registration Request message (i.e. containing cleartext IEs and non-cleartext IEs) in the NAS message container that is sent as part of the Security Mode Complete message in step 9b.

When the UE is performing an Initial Registration (i.e. the UE is in RM-DEREGISTERED state) with a native 5G-GUTI then the UE shall indicate the related GUAMI information in the AN parameters. When the UE is performing an Initial Registration with its SUCI, the UE shall not indicate any GUAMI information in the AN parameters.

When the UE is performing an Initial Registration or a Mobility Registration and if CIoT 5GS Optimisations are supported the UE shall indicate its Preferred Network Behaviour (see clause 5.31.2 of TS 23.501 [2]). If S1 mode is supported the UE's EPC Preferred Network Behaviour is included in the S1 UE network capabilities in the Registration Request message, see clause 8.2.6.1 of TS 24.501 [25].

For an Emergency Registration, the SUCI shall be included if the UE does not have a valid 5G-GUTI available; the PEI shall be included when the UE has no SUPI and no valid 5G-GUTI. In other cases, the 5G-GUTI is included and it indicates the last serving AMF.

The UE may provide the UE's usage setting based on its configuration as defined in clause 5.16.3.7 of TS 23.501 [2]. The UE provides Requested NSSAI (as described in clause 5.15.5.2.1 of TS 23.501 [2] and if the UE supports the subscription-based restrictions to simultaneous registration of network slices, also taking into account the NSSRG Information constraints as described in clause 5.15.12 of TS 23.501 [2] and in the case of Initial Registration or Mobility Registration Update, the UE includes the Mapping Of Requested NSSAI (if available), which is the mapping of each S-NSSAI of the Requested NSSAI to the HPLMN S-NSSAIs, to ensure that the network is able to verify whether the S-NSSAI(s) in the Requested NSSAI are permitted based on the Subscribed S-NSSAIs. If the Network Slice Replacement is used and the UE is configured with Mapping Of Alternative NSSAI, the Requested NSSAI may include Alternative S-NSSAI(s). If the AMF determines that S-NSSAI(s) that the UE requests are not Alternative S-NSSAI(s) in the UE context and not Subscribed S-NSSAIs, the AMF determines to update the UE configuration as described in clause 5.15.19 of TS 23.501 [2]. In the case of inter PLMN mobility, if the serving PLMN S-NSSAI(s) corresponding to the established PDU Session(s) are not present in the UE, the associated HPLMN S-NSSAI(s) associated with the established PDU Session(s) shall be provided in the Mapping Of Requested NSSAI as described in clause 5.15.5.2.1 TS 23.501 [2]. If the UEs supports reconnection to the network due to RAN timing synchronization status change as described in TS 23.501 [2], the UE indicates the support of this capability to the network. If the UE supports UE configuration of network-controlled Slice Usage Policy and the UE stores Slice Usage Policy, the UE shall include an on demand S-NSSAI in the Requested NSSAI only when applications in the UE require data transmission by a PDU session associated with the on demand S-NSSAI as described in clause 5.15.15 of TS 23.501 [2].

The UE includes the Default Configured NSSAI Indication if the UE is using a Default Configured NSSAI, as defined in TS 23.501 [2].

The UE may include UE paging probability information if it supports the assignment of WUS Assistance Information or AMF PEIPS Assistance Information from the AMF (see TS 23.501 [2]).

The UE may include Paging Subgrouping Support Indication as defined in TS 23.501 [2].

In the case of Mobility Registration Update, the UE includes in the List Of PDU Sessions To Be Activated the PDU Sessions for which there are pending uplink data. When the UE includes the List Of PDU Sessions To Be Activated, the UE shall indicate PDU Sessions only associated with the access the Registration Request is related to. As defined in TS 24.501 [25] the UE shall include always-on PDU Sessions which are accepted by the network in the List Of PDU Sessions To Be Activated even if there are no pending uplink data for those PDU Sessions.

NOTE 3: A PDU Session corresponding to a LADN is not included in the List Of PDU Sessions To Be Activated when the UE is outside the area of availability of the LADN.

The UE MM Core Network Capability is provided by the UE and handled by AMF as defined in clause 5.4.4a of TS 23.501 [2]. The UE includes in the UE MM Core Network Capability an indication if it supports Request Type flag "handover" for PDN connectivity request during the attach procedure as defined in clause 5.17.2.3.1 of TS 23.501 [2]. If the UE supports 'Strictly Periodic Registration Timer Indication', the UE indicates its capability of 'Strictly Periodic Registration Timer Indication' in the MICO Indication. If the UE supports CAG, the UE indicates its capability of "CAG supported" in the UE MM Core Network Capability. If the UE operating two or more USIMs, supports and intends to use one or more Multi-USIM feature(s), the UE indicates one or more Multi-USIM specific features described in clause 5.38 of TS 23.501 [2] in the UE MM Core Network Capability. If the UE supports equivalent SNPNs, the UE indicates its capability of "equivalent SNPNs" in the UE MM Core Network Capability. If the UE supports Unavailability Period, the UE indicates its capability of "Unavailability Period Support" in the UE MM Core Network Capability. If the UE supports LADN per DNN and S-NSSAI, the UE indicates its support of LADN per DNN and S-NSSAI in the UE MM Core Network Capability. If the UE supports the Network Slice Replacement feature, the UE indicates support for Network Slice Replacement feature as described in clause 5.15.19 of TS 23.501 [2]. If the UE supports UE configuration of network-controlled Slice Usage Policy, the UE indicates its capability of "UE Configuration of network-controlled Slice Usage Policy" in the UE MM Core Network Capability as described in clause 5.15.15 of TS 23.501 [2].

The UE may provide either the LADN DNN(s) or an Indication Of Requesting LADN Information as described in clause 5.6.5 of TS 23.501 [2].

If available, the last visited TAI shall be included in order to help the AMF produce Registration Area for the UE.

NOTE 4: With NR satellite access, the last visited TAI is determined as specified in clause 5.4.11.6 of TS 23.501 [2].

The Security parameters are used for Authentication and integrity protection, see TS 33.501 [15]. Requested NSSAI indicates the Network Slice Selection Assistance Information (as defined in clause 5.15 of TS 23.501 [2]). The PDU Session status indicates the previously established PDU Sessions in the UE. When the UE is connected to the two AMFs belonging to different PLMN via 3GPP access and non-3GPP access then the PDU Session status indicates the established PDU Session of the current PLMN in the UE.

The Follow-on request is included when the UE has pending uplink signalling and the UE doesn't include List Of PDU Sessions To Be Activated, or the Registration type indicates the UE wants to perform an Emergency Registration. In Initial Registration and Mobility Registration Update, UE provides the UE Requested DRX parameters, as defined in clause 5.4.5 of TS 23.501 [2]. The UE may provide the extended idle mode DRX parameters as defined in clause 5.31.7.2 of TS 23.501 [2] to request extended idle mode DRX.

The UE provides UE Radio Capability Update indication as described in TS 23.501 [2].

The UE includes the MICO Indication and optionally a Requested Active Time value and Requested Periodic Update time value if the UE wants to use MICO Mode with Active Time.

For a UE using NR satellite access that provides discontinuous coverage or an event is triggered in the UE that would make the UE unavailable for a certain period of time, the UE may include an Unavailability Type, an Unavailability Period Duration and/or Start of Unavailability Period as described in clause 5.4.13.1 of TS 23.501 [2].

The UE may indicate its Service Gap Control Capability in the UE MM Core Network Capability, see clause 5.31.16 of TS 23.501 [2].

For a UE with a running Service Gap timer in the UE, the UE shall not set Follow-on Request indication or Uplink data status in the Registration Request message (see clause 5.31.16 of TS 23.501 [2]), except for network access for regulatory prioritized services like Emergency services or exception reporting.

If UE supports RACS and has been assigned UE Radio Capability ID(s), the UE shall indicate a UE Radio Capability ID as defined in clause 5.4.4.1a of TS 23.501 [2] as non-cleartext IE.

The PEI may be retrieved in initial registration from the UE as described in clause 4.2.2.2.1.

If a UE supports the subscription-based restrictions to simultaneous registration of network slices feature, it includes the NSSRG handling support indication in the UE 5GMM Core Network Capability according to clause 5.15.12 of TS 23.501 [2]. The AMF stores whether the UE supports this feature in the UE context.

If a UE supports the temporary available network slices feature, it includes the indication of support for temporary available network slices in the UE 5GMM Network Capability according to clause 5.15.16 of TS 23.501 [2].

When a Multi-USIM UE wants to enter CM-IDLE state immediately e.g. after having performed mobility or periodic registration, it includes the Release Request indication and optionally provides Paging Restriction Information.

When the UE is performing a Disaster Roaming Registration, the UE may indicate the PLMN with Disaster Condition for the cases as defined in TS 24.501 [25].

2. If a 5G-S-TMSI or GUAMI is not included or the 5G-S-TMSI or GUAMI does not indicate a valid AMF the (R)AN, based on (R)AT and Requested NSSAI, if available, selects an AMF

The (R)AN selects an AMF as described in clause 6.3.5 of TS 23.501 [2]. If UE is in CM-CONNECTED state, the (R)AN can forward the Registration Request message to the AMF based on the N2 connection of the UE.

If the (R)AN cannot select an appropriate AMF, it forwards the Registration Request to an AMF which has been configured, in (R)AN, to perform AMF selection.

3. (R)AN to new AMF: N2 message (N2 parameters, Registration Request (as described in step 1) and [LTE-M Indication].

When NG-RAN is used, the N2 parameters include the Selected PLMN ID (or PLMN ID and NID, see clause 5.30 of TS 23.501 [2]), Location Information and Cell Identity related to the cell in which the UE is camping, UE Context Request which indicates that a UE context including security information needs to be setup at the NG-RAN.

When NG-RAN is used, the N2 parameters shall also include the Establishment cause and IAB-Indication or MBSR Indication if the indication is received in AN parameters in step 1.

Mapping Of Requested NSSAI is provided only if available.

If the Registration type indicated by the UE is Periodic Registration Update, then steps 4 to 19 may be omitted.

When the Establishment cause is associated with priority services (e.g. MPS, MCS), the AMF includes a Message Priority header to indicate priority information. Other NFs relay the priority information by including the Message Priority header in service-based interfaces, as specified in TS 29.500 [17].

The RAT Type the UE is using is determined (see clause 4.2.2.2.1) and based on it the AMF determines whether the UE is performing Inter-RAT mobility to or from NB-IoT. If the AMF receives the LTE M indication, then it considers that the RAT Type is LTE-M and stores the LTE-M Indication in UE Context.

If a UE includes a Preferred Network Behaviour, this defines the Network Behaviour the UE supports and is expecting to be available in the network as defined in clause 5.31.2 of TS 23.501 [2].

If the UE has included the Preferred Network Behaviour and what the UE indicated it supports in Preferred Network Behaviour is incompatible with the network support, the AMF shall reject the Registration Request with an appropriate cause value (e.g. one that avoids retries on this PLMN).

If there is a Service Gap timer running in the UE Context in AMF for the UE and Follow-on Request indication or Uplink data status is included in the Registration Request message, the AMF shall ignore the Follow-on Request indication and Uplink data status and not perform any of the actions related to the status.

If the UE has included a UE Radio Capability ID in step 1 and the AMF supports RACS, the AMF stores the Radio Capability ID in UE context.

For NR satellite access, the AMF may verify the UE location and determine whether the PLMN is allowed to operate at the UE location, as described in clause 5.4.11.4 of TS 23.501 [2]. If the UE receives a Registration Reject message with cause value indicating that the PLMN is not allowed to operate at the present UE location, the UE shall attempt to select a PLMN as specified in TS 23.122 [22].

For a Disaster Roaming Registration, based on the ULI (including Cell ID) received from the NG-RAN, the PLMN with Disaster Condition derived from the UE's 5G-GUTI, derived from the UE's SUCI or indicated by the UE and the local configuration, the AMF determines if Disaster Roaming service can be provided. If the current location is not subject to Disaster Roaming service or the Disaster Roaming service is not provided to the PLMN with Disaster Condition derived from the UE's 5G-GUTI, derived from the UE's SUCI or indicated by UE, then the AMF should reject the Registration Request indicating a suitable Cause value.

4. [Conditional] new AMF to old AMF: Namf\_Communication\_UEContextTransfer (complete Registration Request) or new AMF to UDSF: Nudsf\_Unstructured Data Management\_Query().

The new AMF determines the old AMF using the UE's 5G-GUTI. If the new AMF received an NID in the Registration request, it determines that the 5G-GUTI was assigned by an SNPN and determines the old AMF using the 5G-GUTI and NID of the SNPN.

(With UDSF Deployment): If the UE's 5G-GUTI was included in the Registration Request and the serving AMF has changed since last Registration procedure, new AMF and old AMF are in the same AMF Set and UDSF is deployed, the new AMF retrieves the stored UE's SUPI and UE context directly from the UDSF using Nudsf\_UnstructuredDataManagement\_Query service operation or they can share stored UE context via implementation specific means if UDSF is not deployed. This includes also event subscription information by each NF consumer for the given UE. In this case, the new AMF uses integrity protected complete Registration request NAS message to perform and verify integrity protection.

(Without UDSF Deployment): If the UE's 5G-GUTI was included in the Registration Request and the serving AMF has changed since last Registration procedure, the new AMF may invoke the Namf\_Communication\_UEContextTransfer service operation on the old AMF including the complete Registration Request NAS message, which may be integrity protected, as well as the Access Type, to request the UE's SUPI and UE Context. See clause 5.2.2.2.2 for details of this service operation. In this case, the old AMF uses either 5G-GUTI and the integrity protected complete Registration request NAS message, or the SUPI and an indication that the UE is validated from the new AMF, to verify integrity protection if the context transfer service operation invocation corresponds to the UE requested. The old AMF also transfers the event subscriptions information by each NF consumer, for the UE, to the new AMF. If the old AMF has not yet reported a non-zero MO Exception Data Counter to the (H-)SMF, the Context Response also includes the MO Exception Data Counter.

If the old AMF has PDU Sessions for another access type (different from the Access Type indicated in this step) and if the old AMF determines that there is no possibility for relocating the N2 interface to the new AMF, the old AMF returns UE's SUPI and indicates that the Registration Request has been validated for integrity protection, but does not include the rest of the UE context.

For inter PLMN mobility, UE Context information includes HPLMN S-NSSAIs corresponding to the Allowed NSSAI for each Access Type and Partially Allowed NSSAI, without Allowed NSSAI and Partially Allowed NSSAI of old PLMN.

NOTE 5: The new AMF Sets the indication that the UE is validated according to step 9a, if the new AMF has performed successful UE authentication after previous integrity check failure in the old AMF.

NOTE 6: The NF consumers do not need to subscribe for the events once again with the new AMF after the UE is successfully registered with the new AMF.

If the new AMF has already received UE contexts from the old AMF during handover procedure, then step 4,5 and 10 shall be skipped.

For an Emergency Registration, if the UE identifies itself with a 5G-GUTI that is not known to the AMF, steps 4 and 5 are skipped and the AMF immediately requests the SUPI from the UE. If the UE identifies itself with PEI, the SUPI request shall be skipped. Allowing Emergency Registration without a user identity is dependent on local regulations.

5. [Conditional] old AMF to new AMF: Response to Namf\_Communication\_UEContextTransfer (SUPI, UE Context in AMF (as per Table 5.2.2.2.2-1)) or UDSF to new AMF: Nudsf\_Unstructured Data Management\_Query(). The old AMF may start an implementation specific (guard) timer for the UE context.

If the UDSF was queried in step 4, the UDSF responds to the new AMF for the Nudsf\_Unstructured Data Management\_Query invocation with the related contexts including established PDU Sessions, the old AMF includes SMF information DNN, S-NSSAI(s) and PDU Session ID, active NGAP UE-TNLA bindings to N3IWF/TNGF/W-AGF, the old AMF includes information about the NGAP UE-TNLA bindings. If the Old AMF was queried in step 4, Old AMF responds to the new AMF for the Namf\_Communication\_UEContextTransfer invocation by including the UE's SUPI and UE Context.

If old AMF holds information about established PDU Session(s) and it is not an Initial Registration, the old AMF includes SMF information, DNN(s), S-NSSAI(s) and PDU Session ID(s).

If old AMF holds UE context established via N3IWF, W-AGF or TNGF, the old AMF includes the CM state via N3IWF, W-AGF or TNGF. If the UE is in CM-CONNECTED state via N3IWF, W-AGF or TNGF, the old AMF includes information about the NGAP UE-TNLA bindings.

If old AMF fails the integrity check of the Registration Request NAS message, the old AMF shall indicate the integrity check failure. If the new AMF is configured to allow emergency services for unauthenticated UE, the new AMF behaves as follows:

- If the UE has only an emergency PDU Session, the AMF either skips the authentication and security procedure or accepts that the authentication may fail and continues the Mobility Registration Update procedure; or

- If the UE has both emergency and non emergency PDU Sessions and authentication fails, the AMF continues the Mobility Registration Update procedure and deactivates all the non-emergency PDU Sessions as specified in clause 4.3.4.2.

NOTE 7: The new AMF can determine if a PDU Session is used for emergency service by checking whether the DNN matches the emergency DNN.

If old AMF holds information about AM Policy Association and the information about UE Policy Association (i.e. the Policy Control Request Trigger for updating UE Policy as defined in TS 23.503 [20]), the old AMF includes the information about the AM Policy Association, the UE Policy Association and PCF ID. In the roaming case, V-PCF ID and H-PCF ID are included.

If old AMF was a consumer of UE related NWDAF services, the old AMF includes information about active analytics subscriptions, i.e. the Subscription Correlation ID, NWDAF identifier (i.e. Instance ID or Set ID), Analytics ID(s) and associated Analytics specific data in the Namf\_Communication\_UEContextTransfer response. Usage of the analytics information by the new AMF is specified in TS 23.288 [50].

During inter PLMN mobility, the handling of the UE Radio Capability ID in the new AMF is as defined in TS 23.501 [2].

NOTE 8: When new AMF uses UDSF for context retrieval, interactions between old AMF, new AMF and UDSF due to UE signalling on old AMF at the same time is implementation issue.

6. [Conditional] new AMF to UE: Identity Request ().

If the SUCI is not provided by the UE nor retrieved from the old AMF the Identity Request procedure is initiated by AMF sending an Identity Request message to the UE requesting the SUCI.

7. [Conditional] UE to new AMF: Identity Response ().

The UE responds with an Identity Response message including the SUCI. The UE derives the SUCI by using the provisioned public key of the HPLMN, as specified in TS 33.501 [15].

8. The AMF may decide to initiate UE authentication by invoking an AUSF. In that case, the AMF selects an AUSF based on SUPI or SUCI, as described in clause 6.3.4 of TS 23.501 [2].

If the AMF is configured to support Emergency Registration for unauthenticated SUPIs and the UE indicated Registration type Emergency Registration, the AMF skips the authentication or the AMF accepts that the authentication may fail and continues the Registration procedure.

9a. If authentication is required, the AMF requests it from the AUSF; if Tracing Requirements about the UE are available at the AMF, the AMF provides Tracing Requirements in its request to AUSF. For a Disaster Roaming Registration, the AMF may provide the indication of Disaster Roaming service in its request to AUSF. Upon request from the AMF, the AUSF shall execute authentication of the UE. The authentication is performed as described in TS 33.501 [15]. The AUSF selects a UDM as described in clause 6.3.8 of TS 23.501 [2] and gets the authentication data from UDM.

The AUSF may provide the indication of Disaster Roaming service to UDM if the indication is received from AMF. For a Disaster Roaming Registration, the AUSF executes authentication of the UE based on the local policy and/or local configuration as specified in clause 5.40.4 of TS 23.501 [2] and in TS 33.501 [15].

Once the UE has been authenticated the AUSF provides relevant security related information to the AMF. If the AMF provided a SUCI to AUSF, the AUSF shall return the SUPI to AMF only after the authentication is successful.

After successful authentication in new AMF, which is triggered by the integrity check failure in old AMF at step 5, the new AMF invokes step 4 above again and indicates that the UE is validated (i.e. through the reason parameter as specified in clause 5.2.2.2.2).

9b If NAS security context does not exist, the NAS security initiation is performed as described in TS 33.501 [15]. If the UE had no NAS security context in step 1, the UE includes the full Registration Request message as defined in TS 24.501 [25].

The AMF decides if the Registration Request needs to be rerouted as described in clause 4.2.2.2.3, where the initial AMF refers to the AMF.

9c. The AMF initiates NGAP procedure to provide the 5G-AN with security context as specified in TS 38.413 [10] if the 5G-AN had requested for UE Context. Also, if the AMF decides that EPS fallback is supported (e.g. based on UE capability to support Request Type flag "handover" for PDN connectivity request during the attach procedure as defined in clause 5.17.2.3.1 of TS 23.501 [2], subscription data and local policy), the AMF shall send an indication "Redirection for EPS fallback for voice is possible" towards 5G-AN as specified in TS 38.413 [10]. Otherwise, the AMF indicates "Redirection for EPS fallback for voice is not possible". In addition, if Tracing Requirements about the UE are available at the AMF, the AMF provides the 5G-AN with Tracing Requirements in the NGAP procedure. If QMC Configuration information is available at the AMF, the AMF provides the 5G-AN with QMC Configuration information in the NGAP procedure.

9d. The 5G-AN stores the security context and acknowledges to the AMF. The 5G-AN uses the security context to protect the messages exchanged with the UE as described in TS 33.501 [15].

10. [Conditional] new AMF to old AMF: Namf\_Communication\_RegistrationStatusUpdate (PDU Session ID(s) to be released e.g. due to slice not supported).

If the AMF has changed the new AMF informs the old AMF that the registration of the UE in the new AMF is completed by invoking the Namf\_Communication\_RegistrationStatusUpdate service operation.

If the authentication/security procedure fails, then the Registration shall be rejected and the new AMF invokes the Namf\_Communication\_RegistrationStatusUpdate service operation with a reject indication towards the old AMF. The old AMF continues as if the UE context transfer service operation was never received.

The new AMF determines the PDU Session(s) that cannot be supported in the new Registration Area in the cases below:

- If one or more of the S-NSSAIs used in the old Registration Area cannot be served in the target Registration Area.

- When continuity of the PDU Session(s) cannot be supported between networks (e.g. SNPN-SNPN mobility, inter-PLMN mobility where no HR agreement exists).

If any of the cases is met, the new AMF invokes the Namf\_Communication\_RegistrationStatusUpdate service operation including the rejected PDU Session ID towards the old AMF. Then the new AMF modifies the PDU Session Status correspondingly. The old AMF informs the corresponding SMF(s) to locally release the UE's SM context by invoking the Nsmf\_PDUSession\_ReleaseSMContext service operation.

If new AMF received in the UE context transfer in step 5 the information about the AM Policy Association and the UE Policy Association and decides, based on local policies, not to use the PCF(s) identified by the PCF ID(s) for the AM Policy Association and the UE Policy Association, then it will inform the old AMF that the AM Policy Association and the UE Policy Association in the UE context is not used any longer and then the PCF selection is performed in step 15.

If the new AMF received in the UE context transfer in step 5 the information about UE related analytics subscription(s), the new AMF may take over the analytics subscription(s) from the old AMF. Otherwise, if the new AMF instead determines to create new analytics subscription(s), it informs the old AMF about the analytics subscriptions (identified by their Subscription Correlation ID) that are not needed any longer and the old AMF may now unsubscribe those NWDAF analytics subscriptions for the UE according to TS 23.288 [50].

11. [Conditional] new AMF to UE: Identity Request/Response (PEI).

If the PEI was not provided by the UE nor retrieved from the old AMF the Identity Request procedure is initiated by AMF sending an Identity Request message to the UE to retrieve the PEI. The PEI shall be transferred encrypted unless the UE performs Emergency Registration and cannot be authenticated.

For an Emergency Registration, the UE may have included the PEI in the Registration Request. If so, the PEI retrieval is skipped.

If the UE supports RACS as indicated in UE MM Core Network Capability, the AMF shall use the PEI of the UE to obtain the IMEI/TAC for the purpose of RACS operation.

12. Optionally the new AMF initiates ME identity check by invoking the N5g-eir\_EquipmentIdentityCheck\_Get service operation (see clause 5.2.4.2.2).

The PEI check is performed as described in clause 4.7.

For an Emergency Registration, if the PEI is blocked, operator policies determine whether the Emergency Registration procedure continues or is stopped.

13. If step 14 is to be performed, the new AMF, based on the SUPI, selects a UDM, then UDM may select a UDR instance. See clause 6.3.9 of TS 23.501 [2].

The AMF selects a UDM as described in clause 6.3.8 of TS 23.501 [2].

14a-c. If the AMF has changed since the last Registration procedure, if UE Registration type is Initial Registration or Emergency Registration, or if the UE provides a SUPI which does not refer to a valid context in the AMF, or if the UE registers to the same AMF it has already registered to a non-3GPP access (i.e. the UE is registered over a non-3GPP access and initiates this Registration procedure to add a 3GPP access), the new AMF registers with the UDM using Nudm\_UECM\_Registration for the access to be registered (and subscribes to be notified when the UDM deregisters this AMF). The UDM based on the "Registration Type" in the Nudm\_UECM\_Registration request, can act on SoR information according to TS 23.122 [22]. In this case, if the AMF does not have event exposure subscription information for this UE, the AMF indicates it to UDM. Then, if the UDM has existing applicable event exposure subscriptions for events detected in AMF for this UE or for any of the groups this UE belongs to (possibly retrieved from UDR), UDM invokes the Namf\_EventExposure\_Subscribe service for recreating the event exposure subscriptions.

The AMF provides the "Homogenous Support of IMS Voice over PS Sessions" indication (see clause 5.16.3.3 of TS 23.501 [2]) to the UDM. The "Homogenous Support of IMS Voice over PS Sessions" indication shall not be included unless the AMF has completed its evaluation of the support of "IMS Voice over PS Session" as specified in clause 5.16.3.2 of TS 23.501 [2].

During initial Registration, if the AMF and UE supports SRVCC from NG-RAN to UTRAN the AMF provides UDM with the UE SRVCC capability.

If the AMF determines that only the UE SRVCC capability has changed, the AMF sends UE SRVCC capability to the UDM.

NOTE 9: At this step, it is possible that the AMF does not have all the information needed to determine the setting of the IMS Voice over PS Session Supported indication for this UE (see clause 5.16.3.2 of TS 23.501 [2]). Hence the AMF can send the "Homogenous Support of IMS Voice over PS Sessions" later on in this procedure.

After AMF has successfully completed the Nudm\_UECM\_Registration operation and if the AMF does not have subscription data for the UE, the AMF retrieves the Access and Mobility Subscription data, SMF Selection Subscription data, UE context in SMF data and LCS mobile origination using Nudm\_SDM\_Get. If the AMF already has subscription data for the UE but the SoR Update Indicator in the UE context requires the AMF to retrieve SoR information depending on the NAS Registration Type ("Initial Registration" or "Emergency Registration") (see Annex C of TS 23.122 [22]), the AMF retrieves the Steering of Roaming information using Nudm\_SDM\_Get. This requires that UDM may retrieve this information from UDR by Nudr\_DM\_Query. After a successful response is received, the AMF subscribes to be notified using Nudm\_SDM\_Subscribe when the data requested is modified, UDM may subscribe to UDR by Nudr\_DM\_Subscribe. The GPSI is provided to the AMF in the Access and Mobility Subscription data from the UDM if the GPSI is available in the UE subscription data. The UDM may provide indication that the subscription data for network slicing is updated for the UE. If the UE is subscribed to MPS in the serving PLMN, "MPS priority" (and optionally, the MPS priority for Messaging indication if it is set (enabled) in the UDM) is included in the Access and Mobility Subscription data provided to the AMF. If the UE is subscribed to MCX in the serving PLMN, "MCX priority" is included in the Access and Mobility Subscription data provided to the AMF. The UDM also provides the IAB-Operation allowed indication or MBSR Operation allowed indication to AMF as part of the Access and Mobility Subscription data. The AMF shall trigger the setup of the UE context in NG-RAN, or modification of the UE context in NG-RAN if the initial setup is at step 9c, including an indication that the IAB-node is authorized or MBSR is authorized. If a S-NSSAI in the Subscribed S-NSSAIs is subject to network slice usage control and the S-NSSAI is dedicated to a single AF, the UDM may provide a Slice Usage Policy information including whether a network slice is on demand and a slice deregistration inactivity timer value for the Subscribed S-NSSAIs as described in clause 5.15.15 of TS 23.501 [2].

The UDM may provide the NCR-Operation allowed indication to AMF as part of the Access and Mobility Subscription data. The AMF shall trigger the setup of the UE context in NG-RAN, or modification of the UE context in NG-RAN if the initial setup is at step 9c, including an indication of NCR-MT authorization information.

For a Disaster Roaming Registration, the AMF may provide the indication of Disaster Roaming service to the UDM. The UDM provides the subscription data for a Disaster Roaming service to the AMF based on the local policy and/or the local configuration as specified in clause 5.40.4 of TS 23.501 [2].

The AMF provides MINT support indication via Nudm\_UECM\_Registration towards UDM, if UE includes the MINT support indication in the 5GMM capability as specified in clause 5.40.2 of TS 23.501 [2] or if the MINT support indication in the 5GMM capability is changed.

If the AMF receives a priority indication (e.g. MPS, MCX) as part of the Access and Mobility Subscription data, but the UE did not provide an Establishment cause associated with priority services, the AMF shall include a Message Priority header to indicate priority information for all subsequent messages (including messages related to SMS delivery as specified in clause 4.13 if the MPS for Messaging indication is included in subscription data). Other NFs relay the priority information by including the Message Priority header in service-based interfaces, as specified in TS 29.500 [17].

The new AMF provides the Access Type it serves for the UE to the UDM and the Access Type is set to "3GPP access". The UDM stores the associated Access Type together with the serving AMF and does not remove the AMF identity associated to the other Access Type if any. The UDM may store in UDR information provided at the AMF registration by Nudr\_DM\_Update.

If the UE was registered in the old AMF for an access and the old and the new AMFs are in the same PLMN, the new AMF sends a separate/independent Nudm\_UECM\_Registration to update UDM with Access Type set to access used in the old AMF, after the old AMF relocation is successfully completed.

The new AMF creates an UE context for the UE after getting the Access and Mobility Subscription data from the UDM. The Access and Mobility Subscription data includes whether the UE is allowed to include NSSAI in the 3GPP access RRC Connection Establishment in clear text. The Access and Mobility Subscription data may include Enhanced Coverage Restricted information. If received from the UDM and the UE included support for restriction of use of Enhanced Coverage in step 1, the AMF determines whether Enhanced Coverage is restricted or not for the UE as specified in clause 5.31.12 of TS 23.501 [2] and stores the updated Enhanced Coverage Restricted information in the UE context.

The Access and Mobility Subscription data may include the NB-IoT UE Priority. For subscribed S-NSSAIs subject to NSAC, the AMF stores the corresponding applicable NSAC admission mode.

The subscription data may contain Service Gap Time parameter. If received from the UDM, the AMF stores this Service Gap Time in the UE Context in AMF for the UE.

If the AMF has the LADN service area and UE indication of support for LADN per DNN and S-NSSAI, the AMF applies LADN per DNN and S-NSSAI as described in 5.20b.2 of TS 23.501 [2].

For an Emergency Registration in which the UE was not successfully authenticated, the AMF shall not register with the UDM.

The AMF enforces the Mobility Restrictions as specified in clause 5.3.4.1.1 of TS 23.501 [2]. For an Emergency Registration, the AMF shall not check for Mobility Restrictions, access restrictions, regional restrictions or subscription restrictions. For an Emergency Registration, the AMF shall ignore any unsuccessful registration response from UDM and continue with the Registration procedure.

NOTE 10: The AMF can, instead of the Nudm\_SDM\_Get service operation, use the Nudm\_SDM\_Subscribe service operation with an Immediate Report Indication that triggers the UDM to immediately return the subscribed data if the corresponding feature is supported by both the AMF and the UDM.

14d. When the UDM stores the associated Access Type (e.g. 3GPP) together with the serving AMF as indicated in step 14a, it will cause the UDM to initiate a Nudm\_UECM\_DeregistrationNotification (see clause 5.2.3.2.2) to the old AMF corresponding to the same (e.g. 3GPP) access, if one exists. If the timer started in step 5 is not running, the old AMF may remove the UE context for the same Access Type. Otherwise, the AMF may remove UE context for the same Access Type when the timer expires. If the serving NF removal reason indicated by the UDM is Initial Registration, then, as described in clause 4.2.2.3.2, the old AMF invokes the Nsmf\_PDUSession\_ReleaseSMContext (SM Context ID) service operation towards all the associated SMF(s) of the UE to notify that the UE is deregistered from old AMF for the same Access Type. The SMF(s) shall release the PDU Session on getting this notification.

If the old AMF has established an AM Policy Association and a UE Policy Association with the PCF(s) and the old AMF did not transfer the PCF ID(s) to the new AMF (e.g. new AMF is in different PLMN), the old AMF performs an AMF-initiated Policy Association Termination procedure, as defined in clause 4.16.3.2 and performs an AMF-initiated UE Policy Association Termination procedure, as defined in clause 4.16.13.1. In addition, if the old AMF transferred the PCF ID(s) in the UE context but the new AMF informed in step 10 that the AM Policy Association information and UE Policy Association information in the UE context will not be used then the old AMF performs an AMF-initiated Policy Association Termination procedure, as defined in clause 4.16.3.2 and performs an AMF-initiated UE Policy Association Termination procedure, as defined in clause 4.16.13.1.

If the old AMF has an N2 connection for that UE (e.g. because the UE was in RRC\_INACTIVE state but has now moved to E-UTRAN or moved to an area not served by the old AMF), the old AMF shall perform AN Release (see clause 4.2.6) with a cause value that indicates that the UE has already locally released the NG-RAN's RRC Connection.

If the UE context in the old AMF contains an Allowed NSSAI or Partially Allowed NSSAI including one or more S-NSSAI(s) subject to NSAC, the old AMF upon receipt of the Nudm\_UECM\_DeregistrationNotification from the UDM, sends an update request message for each S-NSSAI subject to NSAC to the corresponding NSACF(s) with update flag parameter set to decrease (see clause 4.2.11.2).

At the end of registration procedure, the AMF may initiate synchronization of event exposure subscriptions with the UDM if the AMF does not indicate unavailability of event exposure subscription in step 14a.

NOTE 11: The AMF can initiate synchronization with UDM even if events are available in the UE context (e.g. as received from old AMF) at any given time and based on local policy. This can be done during subscription change related event.

14e. [Conditional] If old AMF does not have UE context for another access type (i.e. non-3GPP access), the Old AMF unsubscribes with the UDM for subscription data using Nudm\_SDM\_unsubscribe.

15. If the AMF decides to initiate PCF communication, the AMF acts as follows.

If the new AMF decides to use the (V-)PCF identified by the (V-)PCF ID included in UE context from the old AMF in step 5, the AMF contacts the (V-)PCF identified by the (V-)PCF ID to obtain policy. If the AMF decides to perform PCF discovery and selection and the AMF selects a (V)-PCF and may select an H-PCF (for roaming scenario) as described in clause 6.3.7.1 of TS 23.501 [2] and according to the V-NRF to H-NRF interaction described in clause 4.3.2.2.3.3.

As described in clause 6.3.7.1 of TS 23.501 [2], if the AMF receives PCF Selection Assistance info from the UDM, the AMF checks if a list of DNN, S-NSSAI combinations are provided in the PCF Selection Assistance Info then the AMF checks local configuration to determine which DNN, S-NSSAI to use then selects the PCF ID included in the corresponding UE Context in the SMF data. If no PCF ID is received, the AMF select the PCF by considering other criteria, defined in clause 6.3.7.1 of TS 23.501 [2].

16. [Optional] new AMF performs an AM Policy Association Establishment/Modification. For an Emergency Registration, this step is skipped.

If the new AMF selects a new (V-)PCF in step 15, the new AMF performs AM Policy Association Establishment with the selected (V-)PCF as defined in clause 4.16.1.2.

If the (V-)PCF identified by the (V-)PCF ID included in UE context from the old AMF is used, the new AMF performs AM Policy Association Modification with the (V-)PCF as defined in clause 4.16.2.1.2.

If the AMF notifies the Mobility Restrictions (e.g. UE location) to the PCF for adjustment, or if the PCF updates the Mobility Restrictions itself due to some conditions (e.g. application in use, time and date), the PCF shall provide the updated Mobility Restrictions to the AMF. If the subscription information includes Tracing Requirements, the AMF provides the PCF with Tracing Requirements.

If the AMF supports DNN replacement, the AMF provides the PCF with the Allowed NSSAI and Partially Allowed NSSAI and if available, the Mapping Of Allowed NSSAI and Mapping Of Partially Allowed NSSAI.

If the PCF supports DNN replacement, the PCF provides the AMF with triggers for DNN replacement.

If the PCF supports the slice replacement, the PCF provides the AMF with triggers for slice replacement.

If a S-NSSAI in subject to network slice usage control, the PCF may provide a Slice Usage Policy information including, whether a network slice is on demand and a slice deregistration inactivity timer value, for the Subscribed S-NSSAIs as described in clause 5.15.15 of TS 23.501 [2].

17. [Conditional] AMF to SMF: Nsmf\_PDUSession\_UpdateSMContext () or Nsmf\_PDUSession\_ReleaseSMContext ().

For an Emergency Registered UE (see TS 23.501 [2]), this step is applied when the Registration Type is Mobility Registration Update.

The AMF invokes the Nsmf\_PDUSession\_UpdateSMContext (see clause 5.2.8.2.6) in the following scenario(s):

- If the List Of PDU Sessions To Be Activated is included in the Registration Request in step 1, the AMF sends Nsmf\_PDUSession\_UpdateSMContext Request to SMF(s) associated with the PDU Session(s) in order to activate User Plane connections of these PDU Session(s). Steps from step 5 onwards described in clause 4.2.3.2 are executed to complete the User Plane connection activation without sending the RRC Inactive Assistance Information and without sending MM NAS Service Accept from the AMF to (R)AN described in step 12 of clause 4.2.3.2. When a User Plane connection for a PDU Session is activated, the AS layer in the UE indicates it to the NAS layer.

- If the AMF has determined in step 3 that the UE is performing Inter-RAT mobility to or from NB-IoT, the AMF sends Nsmf\_PDUSession\_UpdateSMContext Request to SMF(s) associated with the UEs PDU Session(s), so the SMF(s) can update them according to the "PDU Session continuity at inter RAT mobility" subscription data. Steps from step 5 onwards described in clause 4.2.3.2 are executed without sending MM NAS Service Accept from the AMF to (R)AN described in step 12 of clause 4.2.3.2.

When the serving AMF has changed, the new serving AMF notifies the SMF for each PDU Session that it has taken over the responsibility of the signalling path towards the UE: the new serving AMF invokes the Nsmf\_PDUSession\_UpdateSMContext service operation using SMF information received from the old AMF at step 5. It also indicates whether the PDU Session is to be re-activated.

NOTE 12: 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 addition, a V-SMF is removed in case the UE moves from a VPLMN into the HPLMN. In these cases, 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.

NOTE 13: In the case of Indirect Network Sharing, when UE of participating operator moves between the shared network area and an area of its home network, a V-SMF can be inserted or removed. In this case, the related procedure of mobility registration update with V-SMF insertion/removal described in clause 4.23.3 is applied.

Steps from step 5 onwards described in clause 4.2.3.2 are executed. In the case that the intermediate UPF insertion, removal, or change is performed for the PDU Session(s) not included in "PDU Session(s) to be re-activated", the procedure is performed without N11 and N2 interactions to update the N3 user plane between (R)AN and 5GC.

The AMF invokes the Nsmf\_PDUSession\_ReleaseSMContext service operation towards the SMF in the following scenario:

- If any PDU Session status indicates that it is released at the UE, the AMF invokes the Nsmf\_PDUSession\_ReleaseSMContext service operation towards the SMF in order to release any network resources related to the PDU Session.

- If the UE has moved into a TA not supporting the S-NSSAI associated with the PDU Session, and the AMF determines to release the PDU Session, and no N2 interaction is needed (i.e. UP connection of the PDU Session is not active), the AMF sets the PDU Session status indicating that the PDU Session is released in the network and the AMF invokes the Nsmf\_PDUSession\_ReleaseSMContext service operation towards the SMF.

If the serving AMF is changed, the new AMF shall wait until step 18 is finished with all the SMFs associated with the UE. Otherwise, steps 19 to 22 can continue in parallel to this step.

18. [Conditional] If the new AMF and the old AMF are in the same PLMN, the new AMF sends a UE Context Modification Request to N3IWF/TNGF/W-AGF as specified in TS 29.413 [64].

If the AMF has changed and the old AMF has indicated that the UE is in CM-CONNECTED state via N3IWF, W-AGF or TNGF and if the new AMF and the old AMF are in the same PLMN, the new AMF creates an NGAP UE association towards the N3IWF/TNGF/W-AGF to which the UE is connected. This automatically releases the existing NGAP UE association between the old AMF and the N3IWF/TNGF/W-AGF.

19. N3IWF/TNGF/W-AGF sends a UE Context Modification Response to the new AMF.

19a. [Conditional] After the new AMF receives the response message from the N3IWF, W-AGF or TNGF in step 19, the new AMF registers with the UDM using Nudm\_UECM\_Registration as step 14a, but with the Access Type set to "non-3GPP access". The UDM stores the associated Access Type together with the serving AMF and does not remove the AMF identity associated to the other Access Type if any. The UDM may store in UDR information provided at the AMF registration by Nudr\_DM\_Update.

19b. [Conditional] When the UDM stores the associated Access Type (i.e. non-3GPP) together with the serving AMF as indicated in step 19a, it will cause the UDM to initiate a Nudm\_UECM\_DeregistrationNotification (see clause 5.2.3.2.2) to the old AMF corresponding to the same (i.e. non-3GPP) access. The old AMF removes the UE context for non-3GPP access.

19c. The Old AMF unsubscribes with the UDM for subscription data using Nudm\_SDM\_unsubscribe.

20a. Void.

21. New AMF to UE: Registration Accept (5G-GUTI, Registration Area, [Mobility restrictions], [PDU Session status], [Allowed NSSAI], [Mapping Of Allowed NSSAI], [Partially Allowed NSSAI], [Mapping Of Partially Allowed NSSAI], [TAI List for S-NSSAIs in Partially Allowed NSSAI], [Configured NSSAI for the Serving PLMN], [Mapping Of Configured NSSAI], [NSSRG Information], [NSAG Information], [rejected S-NSSAIs], [TAI List for any rejected S-NSSAI Partially in the RA], [Pending NSSAI], [Mapping Of Pending NSSAI], [Periodic Registration Update timer], [Active Time], [Strictly Periodic Registration Timer Indication], [LADN Information], [MICO Indication], [IMS Voice over PS session supported Indication], [Emergency Service Support indicator], [Accepted DRX parameters for E-UTRA and NR], [Accepted DRX parameters for NB-IoT], [extended idle mode DRX parameters], [Paging Time Window], [Network support of Interworking without N26], [Access Stratum Connection Establishment NSSAI Inclusion Mode], [Network Slicing Subscription Change Indication], [Operator-defined access category definitions], [List of equivalent PLMNs], [Enhanced Coverage Restricted information], [Supported Network Behaviour], [Service Gap Time], [PLMN-assigned UE Radio Capability ID], [PLMN-assigned UE Radio Capability ID deletion], [WUS Assistance Information], [AMF PEIPS Assistance Information], [Truncated 5G-S-TMSI Configuration], [Connection Release Supported], [Paging Cause Indication for Voice Service Supported], [Paging Restriction Supported], [Reject Paging Request Supported], [Paging Restriction Information acceptance / rejection], ["List of PLMN(s) to be used in Disaster Condition"], [Disaster Roaming wait range information], [Disaster Return wait range information], [Forbidden TAI(s)], [List of equivalent SNPNs], [Registered NID], [Unavailability Period Support], [MBSR authorization information], [Return To Coverage Notification Not Required], [Unavailability Period Duration], [Start of Unavailability Period], [S-NSSAI location availability information], [Mapping Of Alternative NSSAI], [Slice Usage Policy], [Maximum Time Offset]).

If the Requested NSSAI does not include S-NSSAIs which map to S-NSSAIs of the HPLMN subject to Network Slice-Specific Authentication and Authorization and the AMF determines that no S-NSSAI can be provided in the Allowed NSSAI for the UE in the current UE's Tracking Area and if no default S-NSSAI(s) not yet involved in the current UE Registration procedure could be further considered, the AMF shall reject the UE Registration and shall include in the rejection message the list of Rejected S-NSSAIs, each of them with the appropriate rejection cause value.

The Allowed NSSAI for the Access Type for the UE is included in the N2 message carrying the Registration Accept message. The Allowed NSSAI contains only S-NSSAIs that do not require, based on subscription information, Network Slice-Specific Authentication and Authorization and based on the UE Context in the AMF, those S-NSSAIs for which Network Slice-Specific Authentication and Authorization previously succeeded, regardless of the Access Type. The Mapping Of Pending NSSAI is the mapping of each S-NSSAI of the Pending NSSAI for the Serving PLMN to the HPLMN S-NSSAIs.

If the UE has indicated its support for the Partial Network Slice support in a Registration Area (see clause 5.15.17 of TS 23.501 [2]) in the UE MM Core Network Capability in the Registration Request, the AMF may include Partially Allowed NSSAI in the Registration Accept with the related TAI List for S-NSSAIs in Partially allowed NSSAI as per TS 23.501 [2] clause 5.1517 and in the N2 message carrying the Registration Accept message without the TAI List for S-NSSAIs in Partially allowed NSSAI. The Partially Allowed NSSAI contains only S-NSSAIs that do not require, based on subscription information, Network Slice-Specific Authentication and Authorization and based on the UE Context in the AMF, those S-NSSAIs for which Network Slice-Specific Authentication and Authorization previously succeeded, regardless of the Access Type. The Mapping Of Partially Allowed NSSAI is the mapping of each S-NSSAI of the Partially Allowed NSSAI for the Serving PLMN to the HPLMN S-NSSAIs.

If the UE has indicated its support for the Partial Network Slice support in a Registration Area (see clause 5.15.17 of TS 23.501 [2]) in the UE MM Core Network Capability in the Registration Request, the AMF may include S-NSSAI(s) rejected partially in the RA in the Registration Accept with the applicable TAI List for rejected S-NSSAI partially in the RA.

If the UE has indicated its support of the Network Slice-Specific Authentication and Authorization procedure in the UE MM Core Network Capability in the Registration Request, AMF includes in the Pending NSSAI the S-NSSAIs that map to an S-NSSAI of the HPLMN which in the subscription information has indication that it is subject to Network Slice-Specific Authentication and Authorization, as described in clause 4.6.2.4 of TS 24.501 [25]. In such case, the AMF then shall trigger at step 25 the Network Slice-Specific Authentication and Authorization procedure, specified in clause 4.2.9.2, except, based on Network policies, for those S-NSSAIs for which Network Slice-Specific Authentication and Authorization have already been initiated on another Access Type for the same S-NSSAI(s). The UE shall not attempt re-registration with the S-NSSAIs included in the list of Pending NSSAIs until the Network Slice-Specific Authentication and Authorization procedure has been completed, regardless of the Access Type.

If the UE has not indicated its support of the Network Slice-Specific Authentication and Authorization procedure in the UE 5GMM Core Network Capability in the Registration Request and the Requested NSSAI includes S-NSSAIs which map to HPLMN S-NSSAIs subject to Network Slice-Specific Authentication and Authorization, the AMF includes those S-NSSAIs in the Requested NSSAI in the Rejected S-NSSAIs.

If no S-NSSAI can be provided in the Allowed NSSAI because:

- all the S-NSSAI(s) in the Requested NSSAI are to be subject to Network Slice-Specific Authentication and Authorization; or

- no Requested NSSAI was provided or none of the S-NSSAIs in the Requested NSSAI matches any of the Subscribed S-NSSAIs and all the S-NSSAI(s) marked as default in the Subscribed S-NSSAIs are to be subject to Network Slice-Specific Authentication and Authorization.

The AMF shall provide an empty Allowed NSSAI. Upon receiving an empty Allowed NSSAI and a Pending NSSAI, the UE is registered in the PLMN but shall wait for the completion of the Network Slice-Specific Authentication and Authorization procedure without attempting to use any service provided by the PLMN on any access, except e.g. emergency services (see TS 24.501 [25]), until the UE receives an Allowed NSSAI.

The AMF stores the NB-IoT Priority retrieved in Step 14 and associates it to the 5G-S-TMSI allocated to the UE.

If the Registration Request message received over 3GPP access does not include any Paging Restriction Information, the AMF shall delete any stored Paging Restriction Information for this UE and stop restricting paging accordingly.

If the Registration Request message received over 3GPP access includes the Paging Restriction Information, AMF may accept or reject the Paging Restriction Information requested by the UE based on operator policy. If the AMF rejects the Paging Restriction Information, the AMF removes any stored Paging Restriction Information from the UE context and discards the UE requested Paging Restriction Information. If the AMF accepts the Paging Restriction Information from the UE, the AMF stores the Paging Restriction Information from the UE in the UE context and informs the UE about the acceptance/rejection of the requested Paging Restriction Information in the Registration Accept message.

If the Registration Request message received over 3GPP access includes a Release Request indication, then:

- the AMF updates the UE context with any received Paging Restriction Information, then enforces it in the network triggered Service Request procedure as described in clause 4.2.3.3;

- the AMF does not establish User Plane resources and triggers the AN release procedure as described in clause 4.2.6 after the completion of Registration procedure.

The AMF sends a Registration Accept message to the UE indicating that the Registration Request has been accepted. 5G-GUTI is included if the AMF allocates a new 5G-GUTI. Upon receiving a Registration Request message of type "Initial Registration", "mobility registration update", "Disaster Roaming Initial Registration" or "Disaster Roaming Mobility Registration Update" from the UE, the AMF shall include a new 5G-GUTI in the Registration Accept message. Upon receiving a Registration Request message of type "periodic registration update" from the UE, the AMF should include a new 5G-GUTI in the Registration Accept message. If the UE is already in RM-REGISTERED state via another access in the same PLMN, the UE shall use the 5G-GUTI received in the Registration Accept for both registrations. If no 5G-GUTI is included in the Registration Accept, then the UE uses the 5G-GUTI assigned for the existing registration also for the new registration. If the AMF allocates a new Registration area, it shall send the Registration area to the UE via Registration Accept message. For a Disaster Roaming Registration, the AMF allocates the Registration Area limited to the area with Disaster Condition as specified in clause 5.40 of TS 23.501 [2]. If there is no Registration area included in the Registration Accept message, the UE shall consider the old Registration Area as valid. Mobility Restrictions is included if mobility restrictions applies for the UE and Registration Type is not Emergency Registration. The AMF indicates the established PDU Sessions to the UE in the PDU Session status. The UE removes locally any internal resources related to PDU Sessions that are not marked as established in the received PDU Session status. If the AMF invokes the Nsmf\_PDUSession\_UpdateSMContext procedure for UP activation of PDU Session(s) in step 18 and receives rejection from the SMF, then the AMF indicates to the UE the PDU Session ID and the cause why the User Plane resources were not activated. When the UE is connected to the two AMFs belonging to different PLMN via 3GPP access and non-3GPP access then the UE removes locally any internal resources related to the PDU Session of the current PLMN that are not marked as established in received PDU Session status. If the PDU Session status information was in the Registration Request, the AMF shall indicate the PDU Session status to the UE.

If the RAT Type is NB-IoT and the network is configured to use the Control Plane Relocation Indication procedure then the AMF shall include in the Registration Accept message the Truncated 5G-S-TMSI Configuration that the UE using Control Plane CIoT 5GS Optimisation uses to create the Truncated 5G-S-TMSI, see clause 5.31.4.3 of TS 23.501 [2].

The Allowed NSSAI provided in the Registration Accept is valid in the Registration Area and it applies for all the PLMNs which have their Tracking Areas included in the Registration Area. The Mapping Of Allowed NSSAI is the mapping of each S-NSSAI of the Allowed NSSAI to the HPLMN S-NSSAIs. The Mapping Of Configured NSSAI is the mapping of each S-NSSAI of the Configured NSSAI for the Serving PLMN to the HPLMN S-NSSAIs.

For non-roaming UE, if the UE has indicated its support of Slice Usage Policy in the UE 5GMM Core Network Capability, the AMF may include Slice Usage Policies for the slices in the Configured NSSAI as described in clause 5.15.15 of TS 23.501 [2]. In the Slice Usage Policy, the AMF indicates if an S-NSSAI is on demand slice and optionally slice deregistration inactivity timer value. If the AMF includes slice deregistration inactivity timer value, the UE starts any slice deregistration inactivity timer for the on demand S-NSSAIs as described in clause 5.15.15 of TS 23.501 [2]. If the AMF includes updated slice deregistration timer value(s), the UE uses the updated slice deregistration inactivity timer value(s) next time the slice deregistration inactivity timer(s) starts.

If the UE has indicated its support of the subscription-based restrictions to simultaneous registration of network slices feature in the UE 5GMM Core Network Capability, the AMF includes, if available, the NSSRG Information, defined in clause 5.15.12 of TS 23.501 [2].

If the UE has not indicated its support of the subscription-based restrictions to simultaneous registration of network slices feature and the subscription information for the UE includes NSSRG information and the AMF is providing the Configured NSSAI to the UE, the Configured NSSAI shall include the S-NSSAIs according to clause 5.15.12 of TS 23.501 [2].

If the UE has indicated its support for temporary available network slices feature in the UE 5GMM Core Network Capability, the AMF includes validity time defined in clause 5.15.16 of TS 23.501 [2].

If the UE has not indicated its support for temporary available network slices feature in the UE 5GMM Core Network Capability and the AMF is providing the Configured NSSAI to the UE, the Configured NSSAI shall not include the S-NSSAIs if the validity time indicates S-NSSAI is not available according to clause 5.15.16 of TS 23.501 [2].

If the UE has indicated its support of the NSAG feature in the 5GMM Core Network Capability, the AMF includes, if available, the NSAG Information, defined in clause 5.15.14 of TS 23.501 [2].

The AMF shall include in the Registration Accept message the LADN Information for the list of LADNs, described in clause 5.6.5 of TS 23.501 [2], that are available within the Registration area determined by the AMF for the UE. If the UE indicates its support of LADN per DNN and S-NSSAI in the UE MM Core Network Capability, the AMF may include LADN Information per DNN and S-NSSAI. The AMF may include Operator-defined access category definitions to let the UE determinine the applicable Operator-specific access category definitions as described in TS 24.501 [25].

If the UE included MICO Indication in the Registration Request, then AMF responds in the Registration Accept message whether MICO mode should be used in the MICO Indication. When MICO mode is allowed for the UE, the AMF may include an Active Time value and/or Strictly Periodic Registration Timer Indication in the Registration Accept message. The AMF determines the Periodic Registration Update timer value, Active Time value and the Strictly Periodic Registration Timer Indication based on:

- local configuration;

- Expected UE Behaviour if available;

- UE indicated preferences;

- UE capability;

- UE subscription information;

- if using a RAN that provides discontinuous coverage, UE availability (see clause 5.4.13.1 of TS 23.501 [2]); and

- network policies,

or any combination of them so as to enable UE power saving, as described in clause 5.31.7 of TS 23.501 [2]. The AMF determines to apply the Strictly Periodic Registration Timer Indication to the UE if the UE indicates its capability of the Strictly Periodic Registration Timer Indication in the registration request message, as described in step 1. If the AMF provides the Periodic Registration Update timer value with the Strictly Periodic Registration Timer Indication to the UE, the UE and the AMF start the Periodic Registration Update timer after this step, as described in clause 5.31.7.5 of TS 23.501 [2].

In the case of registration over 3GPP access, the AMF Sets the IMS Voice over PS session supported Indication as described in clause 5.16.3.2 of TS 23.501 [2]. In order to set the IMS Voice over PS session supported Indication the AMF may need to perform the UE Capability Match Request procedure in clause 4.2.8a to check the compatibility of the UE and NG-RAN radio capabilities related to IMS Voice over PS. If the AMF hasn't received Voice Support Match Indicator from the NG-RAN on time then, based on implementation, AMF may set IMS Voice over PS session supported Indication and update it at a later stage.

In the case of registration over 3GPP access and the AMF has retrieved or determined according to local configuration a Target NSSAI and a corresponding RFSP Index for the purpose of allowing the NG-RAN to redirect the UE to a cell supporting network slices not available in the current TA as described in clause 5.3.4.3.3 of TS 23.501 [2], the AMF provides the Target NSSAI and the corresponding RFSP Index to the NG-RAN.

In the case of registration over non-3GPP access, the AMF Sets the IMS Voice over PS session supported Indication as described in clause 5.16.3.2a of TS 23.501 [2].

The Emergency Service Support indicator informs the UE that emergency services are supported, i.e. the UE is allowed to request PDU Session for emergency services. If the AMF received "MPS priority" from the UDM as part of Access and Mobility Subscription data, based on operator policy, "MPS priority" is included in the Registration Accept message to the UE to inform the UE whether configuration of Access Identity 1 is valid within the selected PLMN, as specified in TS 24.501 [25]. If the AMF received "MCX priority" from the UDM as part of Access and Mobility Subscription data, based on operator policy and UE subscription to MCX Services, "MCX priority" is included in the Registration Accept message to the UE to inform the UE whether configuration of Access Identity 2 is valid within the selected PLMN, as specified in TS 24.501 [25].

The Accepted DRX parameters are defined in clause 5.4.5 of TS 23.501 [2]. The AMF includes Accepted DRX parameters for NB-IoT, if the UE included Requested DRX parameters for NB-IoT in the Registration Request message. The AMF Sets the Network support of Interworking without N26 parameter as described in clause 5.17.2.3.1 of TS 23.501 [2]. If the AMF accepts the use of extended idle mode DRX, the AMF includes the extended idle mode DRX parameters and Paging Time Window as described in 5.31.7.2 of TS 23.501 [2]. For a UE using NR satellite access that provides discontinuous coverage, the AMF may determine extended idle mode DRX parameters and Paging Time Window considering the Unavailability Period Duration (if available), Start of Unavailability Period (if available) and the UE requested extended idle mode DRX parameters as described in clause 5.4.13.1 of TS 23.501 [2].

If the UDM intends to indicate the UE that subscription has changed, the Network Slicing Subscription Change Indication is included. If the AMF includes Network Slicing Subscription Change Indication, then the UE shall locally erase all the network slicing configuration for all PLMNs and if applicable, update the configuration for the current PLMN based on any received information.

The Access Stratum Connection Establishment NSSAI Inclusion Mode, as specified in clause 5.15.9 of TS 23.501 [2], is included to instruct the UE on what NSSAI, if any, to include in the Access Stratum connection establishment. The AMF can set the value to modes of operation a,b,c defined in clause 5.15.9 of TS 23.501 [2] in the 3GPP Access only if the Inclusion of NSSAI in RRC Connection Establishment Allowed indicates that it is allowed to do so.

For a UE registered in a PLMN, the AMF may provide a List of equivalent PLMNs which is handled as specified in TS 24.501 [25]. The AMF shall not provide a list of equivalent SNPNs to the UE.

For a UE registered in an SNPN and the UE has included support of equivalent SNPNs in step 1, the AMF may provide a List of equivalent SNPNs which is handled as specified in TS 24.501 [25]. The AMF shall not provide a list of equivalent PLMNs to the UE.

If the UE included support for restriction of use of Enhanced Coverage in step 1, the AMF sends the Enhanced Coverage Restricted information to the NG-RAN in N2 message. The AMF also sends Enhanced Coverage Restricted information to the UE in the Registration Accept message.

If the UE receives Enhanced Coverage Restricted information in the Registration Accept message, the UE shall store this information and shall use the value of Enhanced Coverage Restricted information to determine if Enhanced Coverage feature should be used or not.

If the UE and the AMF have negotiated to enable MICO mode via MICO Indication and the AMF uses the Extended connected timer, then the AMF provides the Extended Connected time value to NG-RAN (see clause 5.31.7.3 of TS 23.501 [2]) in this step. The Extended Connected Time value indicates the minimum time the RAN should keep the UE in RRC\_CONNECTED state regardless of inactivity. For a UE using NR satellite access that provides discontinuous coverage, the AMF may determine the Extended Connected Timer value considering the Unavailability Period Duration (if available), Start of Unavailability Period (if available) as described in clause 5.4.13.1 of TS 23.501 [2].

The AMF indicates the CIoT 5GS Optimisations it supports and accepts in the Supported Network Behaviour information (see clause 5.31.2 of TS 23.501 [2]) if the UE included Preferred Network Behaviour in its Registration Request.

The AMF may steer the UE from 5GC by rejecting the Registration Request. The AMF should take into account the Preferred and Supported Network Behaviour (see clause 5.31.2 of TS 23.501 [2]) and availability of EPC to the UE before steering the UE from 5GC.

If the AMF accepts MICO mode as indicated in Registration Accept via MICO Indication and knows there may be mobile terminated data or signalling pending, the AMF maintains the N2 connection for at least the Extended Connected Time as described in clause 5.31.7.3 of TS 23.501 [2] and provides the Extended Connected Time value to the RAN.

The AMF includes Service Gap Time if Service Gap Time is present in the subscription information (steps 14a-c) or the Service Gap Time has been updated by the Subscriber Data Update Notification to AMF procedure (see clause 4.5.1) and the UE has indicated UE Service Gap Control Capability.

If the UE receives a Service Gap Time in the Registration Accept message, the UE shall store this parameter and apply Service Gap Control (see clause 5.31.16 of TS 23.501 [2]).

If the network supports WUS grouping (see TS 23.501 [2]), the AMF shall send the WUS Assistance Information to the UE. If the UE provided the UE paging probability information in Step 1, the AMF takes it into account to determine the WUS Assistance Information.

If the UE provided Paging Subgrouping Support Indication in step 1, a supporting AMF may provide the AMF PEIPS Assistance Information, including the Paging Subgroup ID as defined in TS 23.501 [2].

When the UE and the AMF supports RACS as defined in clause 5.4.4.1a of TS 23.501 [2] and the AMF needs to configure the UE with a UE Radio Capability ID and the AMF already has the UE radio capabilities other than NB-IoT radio capabilities for the UE, the AMF may provide the UE with the UE Radio Capability ID for the UE radio capabilities the UCMF returns to the AMF in a Nucmf\_assign service operation for this UE. Alternatively, when the UE and the AMF support RACS, the AMF may provide the UE with an indication to delete any PLMN-assigned UE Radio Capability ID in this PLMN (see clause 5.4.4.1a of TS 23.501 [2]).

If the UE is "CAG supported" and the AMF needs to update the CAG information of the UE, the AMF may include the CAG information as part of the Mobility Restrictions in the Registration Accept message.

If the UE has indicated the support of Unavailability Period in the UE MM Core Network Capability in the Registration Request, the AMF shall indicate to the UE whether the corresponding feature is supported by providing the "Unavailability Period Support" indication.

If both the UE and the AMF support the Unavailability Period, the AMF may provide an Unavailability Period Duration and/or Start of Unavailability Period determined due to NR satellite access discontinuous coverage during initial registration procedure as described in clause 5.4.1.4 of TS 23.501 [2]. If the UE has provided Unavailability Period Duration and/or Start of Unavailability Period in step 1, the AMF shall store the received Unavailability Period Duration and/or Start of Unavailability Period in UE context. The AMF considers that the UE is unavailable at the start of unavailability period as described in clause 5.4.1.4 of TS 23.501 [2]. The AMF may provide Periodic Registration Update timer based on Unavailability Period Duration and/or Start of Unavailability Period indicated by the UE as described in clause 5.4.1.4 of TS 23.501 [2].

If the Multi-USIM UE has indicated support for one or more Multi-USIM Specific Capabilities in the UE 5GMM Core Network Capability in step 1, the AMF shall indicate to the Multi-USIM UE whether the corresponding one or more Multi-USIM specific features described in clause 5.38 of TS 23.501 [2] are supported, based on network capability and preference by the network (i.e. based on local network policy), by providing one or more of the Connection Release Supported, Paging Cause Indication for Voice Service Supported, Paging Restriction Supported and Reject Paging Request Supported indications. The AMF shall only indicate Paging Restriction Supported together with either Connection Release Supported or Reject Paging Request Supported. The UE shall only use Multi-USIM specific features that the AMF indicated as being supported.

If the NG-RAN provides MBSR indication in step 3 and the subscription data received in step 14 does not allow the MBSR operation, the AMF may either accept the registration with providing the MBSR authorization information to MBSR (IAB-UE), or the AMF may reject the registration if the PLMN does not allow the MBSR (IAB-UE) to be registered to the PLMN as specified in clause 5.35A.4 of TS 23.501 [2].

If the UE and AMF supports Disaster Roaming service, the AMF may include the "list of PLMN(s) to be used in Disaster Condition", Disaster Roaming wait range information and Disaster Return wait range information as specified in TS 23.501 [2].

If AMF receives multiple TAIs from the NG-RAN in step 3 and determines that some, but not all of them are forbidden by subscription or by operator policy, the AMF shall include the forbidden TAI(s) in the Registration Accept message.

In the case of Emergency Registration, the AMF shall not indicate support for any Multi-USIM specific features to the UE.

If the UE has included support of equivalent SNPNs in step 1 and the serving SNPN changes, the AMF shall include the Registered NID in the Registration Accept message as specified in TS 23.501 [2].

For a UE using NR satellite access that provides discontinuous coverage, the AMF may provide Return To Coverage Notification Not Required, which requests the UE in CM-IDLE state to not perform the Mobility Registration Update procedure when it returns to coverage and/or provide the UE with a Unavailability Period Duration and/or Start of Unavailability Period (if available), as described in clause 5.4.13.1 of TS 23.501 [2]. The AMF may determine a Maximum Time Offset and provide it to UE when it is allowed to initiate NAS signalling with the network as described in clause 5.4.13.5 of TS 23.501 [2].

If the UE has indicated the support of S-NSSAI location availability information, the AMF may include S-NSSAI location availability information as described in clause 5.15.18 of TS 23.501 [2].

If the UE indicated a support for the Network Slice Replacement feature in the 5GMM Core Network Capability and the AMF determines that an S-NSSAI from an Allowed NSSAI is to be replaced with an Alternative S-NSSAI (as described in clause 5.15.19 of TS 23.501 [2]), the AMF includes the Mapping Of Alternative NSSAI within the Registration Accept message to the UE and also adds the Alternative S-NSSAI to the Allowed NSSAI and/or Configured NSSAI, if not already included. The Mapping Of Alternative NSSAI is the mapping of each Alternative S-NSSAI, included in the Allowed NSSAI and/or Configured NSSAI, to the corresponding replaced VPLMN S-NSSAI or HPLMN S-NSSAI (as described in clause 5.15.19 of TS 23.501 [2]).

If the UE has indicated a support for reconnection to the network due to RAN timing synchronization status in step 1 as described in TS 23.501 [2], and if the AMF received "clock quality detail level" either as part of an AM Policy Association procedure or from the UDM as part of Clock Quality Reporting Control Information (CQRCI) included in the Access and Mobility Subscription data, "UE reconnection indication" is included in the Registration Accept message to the UE to inform the UE when to connect to the network in case when the UE later detects that the NG-RAN timing synchronization status has changed while the UE is in RRC IDLE or RRC INACTIVE state, as specified in clause 5.27.1.12 of TS 23.501 [2].

21b. [Optional] The new AMF performs a UE Policy Association Establishment as defined in clause 4.16.11. For an Emergency Registration, this step is skipped.

The new AMF sends a Npcf\_UEPolicyControl Create Request to PCF. PCF sends a Npcf\_UEPolicyControl Create Response to the new AMF.

PCF triggers UE Configuration Update Procedure as defined in clause 4.2.4.3.

22. [Conditional] UE to new AMF: Registration Complete ().

The UE sends a Registration Complete message to the AMF when it has successfully updated itself after receiving any of the [Configured NSSAI for the Serving PLMN], [Mapping Of Configured NSSAI], [NSSRG Information], [NSAG Information] and a Network Slicing Subscription Change Indication, or CAG information in step 21.

The UE sends a Registration Complete message to the AMF to acknowledge if a new 5G-GUTI was assigned.

If new 5G-GUTI was assigned, then the UE passes the new 5G-GUTI to its 3GPP access' lower layer when a lower layer (either 3GPP access or non-3GPP access) indicates to the UE's RM layer that the Registration Complete message has been successfully transferred across the radio interface.

NOTE 14: The above is needed because the NG-RAN may use the RRC\_INACTIVE state and a part of the 5G-GUTI is used to calculate the Paging Frame (see TS 38.304 [44] and TS 36.304 [43]). It is assumed that the Registration Complete is reliably delivered to the AMF after the 5G-AN has acknowledged its receipt to the UE.

When the List Of PDU Sessions To Be Activated is not included in the Registration Request and the Registration procedure was not initiated in CM-CONNECTED state, the AMF releases the signalling connection with UE, according to clause 4.2.6.

When the Follow-on request is included in the Registration Request, the AMF should not release the signalling connection after the completion of the Registration procedure.

If the AMF is aware that some signalling is pending in the AMF or between the UE and the 5GC, the AMF should not release the signalling connection immediately after the completion of the Registration procedure.

If the UE has provided Unavailability Period Duration and not included Start of Unavailability Period in step 1, the AMF shall release the signalling connection immediately after the completion of the Registration procedure.

If the UE has indicated Start of Unavailability Period in step 1, the AMF shall release the signalling connection before the start of unavailability period.

If PLMN-assigned UE Radio Capability ID is included in step 21, the AMF stores the PLMN-assigned UE Radio Capability ID in UE context if receiving Registration Complete message.

If the AMF provided updated slice deregistration timer value(s) to the UE in step 21, the AMF uses the corresponding slice deregistration inactivity timer value(s) next time the slice deregistration inactivity timer(s) starts.

If the UE receives PLMN-assigned UE Radio Capability ID deletion indication in step 21, the UE shall delete the PLMN-assigned UE Radio Capability ID(s) for this PLMN.

23. [Conditional] AMF to UDM: If the Access and Mobility Subscription data provided by UDM to AMF in 14b includes Steering of Roaming information with an indication that the UDM requests an acknowledgement of the reception of this information from the UE, the AMF provides the UE acknowledgement to UDM using Nudm\_SDM\_Info. For more details regarding the handling of Steering of Roaming information refer to TS 23.122 [22].

23a. For Registration over 3GPP Access, if the AMF does not release the signalling connection, the AMF sends the RRC Inactive Assistance Information to the NG-RAN.

For Registration over non-3GPP Access, if the UE is also in CM-CONNECTED state on 3GPP access, the AMF sends the RRC Inactive Assistance Information to the NG-RAN. If the Multi-USIM UE has indicated support for the Paging Cause Indication for Voice Service feature and the network supports the Paging Cause Indication for Voice Service, the AMF shall include an indication in the RRC Inactive Assistance Information that the UE supports the Paging Cause Indication for Voice Service to NG-RAN to enable NG-RAN to apply the Paging Cause Indication for Voice Service feature for RAN based paging.

The AMF also uses the Nudm\_SDM\_Info service operation to provide an acknowledgment to UDM that the UE received CAG information, or the Network Slicing Subscription Change Indication (see step 21 and step 22) and acted upon it.

24. [Conditional] AMF to UDM: After step 14a and in parallel to any of the preceding steps, the AMF shall send a "Homogeneous Support of IMS Voice over PS Sessions" indication to the UDM using Nudm\_UECM\_Update:

- If the AMF has evaluated the support of IMS Voice over PS Sessions, see clause 5.16.3.2 of TS 23.501 [2]; and

- If the AMF determines that it needs to update the Homogeneous Support of IMS Voice over PS Sessions, see clause 5.16.3.3 of TS 23.501 [2].

25. [Conditional] If the UE indicates its support for Network Slice-Specific Authentication and Authorization procedure in the UE MM Core Network Capability in Registration Request and any S-NSSAI of the HPLMN is subject to Network Slice-Specific Authentication and Authorization, the related procedure is executed at this step (see clause 4.2.9.1). Once the Network Slice-Specific Authentication and Authorization procedure is completed for all S-NSSAIs, the AMF shall trigger a UE Configuration Update procedure to deliver an Allowed NSSAI (or Partially Allowed NSSAI) containing also the S-NSSAIs for which the Network Slice-Specific Authentication and Authorization was successful and include any rejected NSSAIs with an appropriate rejection cause value.

The AMF stores an indication in the UE context for any S-NSSAI of the HPLMN subject to Network Slice-Specific Authentication and Authorization for which the Network Slice-Specific Authentication and Authorization succeeds.

Once completed the Network Slice-Specific Authentication and Authorization procedure, if the AMF determines that no S-NSSAI can be provided in the Allowed NSSAI for the UE, which is already authenticated and authorized successfully by a PLMN and if no default S-NSSAI(s) could be further considered, the AMF shall execute the Network-initiated Deregistration procedure described in clause 4.2.2.3.3 and shall include in the explicit De-Registration Request message the list of Rejected S-NSSAIs, each of them with the appropriate rejection cause value.

If Unavailability Period Duration is received from the UE and there is "Loss of Connectivity" monitoring event subscription for the UE, the AMF triggers "Loss of Connectivity" monitoring event report and includes the remaining values of the Unavailability Period Duration as described in clause 4.15.

The mobility related event notifications towards the NF consumers are triggered at the end of this procedure for cases as described in clause 4.15.4.

\* \* \* \* Next change \* \* \* \*

#### 4.13.3.1 Registration procedures for SMS over NAS



Figure 4.13.3.1-1: Registration procedure supporting SMS over NAS

1. During Registration procedure in 5GS defined in Figure 4.2.2.2.2-1, to enable SMS over NAS transporting, the UE includes an "SMS supported" indication in Registration Request in step 1-3 indicating the UE's capability for SMS over NAS transport. The "SMS supported" indication indicates whether the UE supports SMS delivery over NAS.

2. Step 4 to step 14 of the Registration procedure in Figure 4.2.2.2.2-1 are performed. The AMF may retrieve the SMS Subscription data and UE Context in SMSF data using Nudm\_SDM\_Get. This requires that UDM may retrieve this information from UDR by Nudr\_DM\_Query. The UDM includes the SMSF information in the Nudm\_SDM\_Get response message if the stored SMSF belongs to the same PLMN of the AMF. After a successful response is received and if SMS service is allowed, the AMF subscribes to be notified using Nudm\_SDM\_Subscribe when the SMS Subscription data is modified and UDM may subscribe to UDR by Nudr\_DM\_Subscribe. For an MPS-subscribed UE, the subscription data may include the MPS priority for Messaging indication. If the AMF receives the MPS for Messaging indication from UDM, the AMF stores the MPS for Messaging indication in the UE context.

The AMF can also receive UE context information containing SMSF Information from old AMF. When AMF re-allocation happens during the Registration procedure, the old AMF transfers SMSF Information to the new AMF as part of UE context in step 5 of Figure 4.2.2.2.2-1.

NOTE 1: The AMF can, instead of the Nudm\_SDM\_Get service operation, use the Nudm\_SDM\_Subscribe service operation with an Immediate Report Indication that triggers the UDM to immediately return the subscribed data if the corresponding feature is supported by both the AMF and the UDM.

3. If the "SMS supported" indication is included in the Registration Request, the AMF checks in the SMS Subscription data that was received in step 2 whether the SMS service is allowed to the UE. If SMS service is allowed and the UE context received in step 2 includes an available SMSF of the serving PLMN, the AMF activates this SMSF Address and continues the registration procedure. If SMS service is allowed but an SMSF of the serving PLMN was not received in step 2, the AMF discovers and selects an SMSF to serve the UE as described in clause 6.3.10 of TS 23.501 [2].

4. Step 15 to step 20 of the Registration procedure in Figure 4.2.2.2.2-1 are performed.

5. The AMF invokes Nsmsf\_SMService\_Activate service operation from the SMSF. The invocation includes AMF address, Access Type, RAT Type, Trace Requirements, GPSI (if available) and SUPI. AMF uses the SMSF Information derived from step 3. Trace Requirements is provided if it has been received by AMF as part of subscription data. When the AMF determines the UE has the MPS for Messaging indication in UE context as specified in step 2, the AMF includes a Message Priority header with a value appropriate for MPS to indicate priority treatment.

6. The SMSF discovers a UDM as described in clause 6.3.8 of TS 23.501 [2].

7a. If the UE context for the current Access Type already exists in the SMSF, the SMSF shall replace the old AMF address with the new AMF address.

Otherwise, the SMSF considers this a Registration request from a new Access Type and the SMSF registers with the UDM using Nudm\_UECM\_Registration with Access Type. As a result, the UDM stores the following information: SUPI, SMSF identity, SMSF address, Access Type(s) in UE Context in SMSF data. The UDM may further store SMSF Information in UDR by Nudr\_DM\_Update (SUPI, Subscription Data, UE Context in SMSF data).

If the Nsmsf\_SMService\_Activate request contains two Access Types and one of them is already registered in the SMSF, the SMSF shall replace the old AMF address with the new AMF address for that Access Type. The SMSF shall then register the other Access Type with the UDM using Nudm\_UECM\_Registration request.

7b-7c SMSF retrieves SMS Management Subscription data (e.g. SMS teleservice, SMS barring list) using Nudm\_SDM\_Get and this requires that UDM may get this information from UDR by Nudr\_DM\_Query (SUPI, Subscription Data, SMS Management Subscription data). After a successful response is received, the SMSF subscribes to be notified using Nudm\_SDM\_Subscribe when the SMS Management Subscription data is modified and UDM may subscribe to notifications from UDR by Nudr\_DM\_Subscribe.

SMSF also creates a UE context to store the SMS subscription information and the AMF address that is serving this UE.

NOTE 2: The SMSF can, instead of the Nudm\_SDM\_Get service operation, use the Nudm\_SDM\_Subscribe service operation with an Immediate Report Indication that triggers the UDM to immediately return the subscribed data if the corresponding feature is supported by both the SMSF and the UDM.

8. The SMSF responds back to the AMF with Nsmsf\_SMService\_Activate service operation response message. The AMF stores the SMSF Information received as part of the UE context.

9. The AMF includes the "SMS allowed" indication to the UE in the Registration Accept message of step 21 of Figure 4.2.2.2.2-1 only after step 8 in which the AMF has received a positive indication from the selected SMSF.

The "SMS allowed" indication in the Registration Accept message indicates to the UE whether the network allows the SMS message delivery over NAS.

\* \* \* \* Next change \* \* \* \*

#### 4.13.3.3 MO SMS over NAS in CM-IDLE (baseline)



Figure 4.13.3.3-1: MO SMS over NAS

1. The UE performs domain selection for UE originating SMS as defined in clause 5.16.3.8 of TS 23.501 [2] if SMS delivery via non 3GPP access is allowed and possible. If an UE under CM-IDLE state is going to send uplink SMS message, then UE and network perform the UE Triggered Service Request procedure firstly as defined in clause 4.2.3.2 to establish a NAS signalling connection to AMF.

2a. The UE builds the SMS message to be sent as defined in TS 23.040 [7] (i.e. the SMS message consists of CP-DATA/RP-DATA/TPDU/SMS-SUBMIT parts). The SMS message is encapsulated in an NAS message with an indication indicating that the NAS message is for SMS transporting. The UE send the NAS message to the AMF.

2b. The AMF forwards the SMS message and SUPI to the SMSF serving the UE over N20 message by invoking Nsmsf\_SMService\_UplinkSMS service operation. In order to permit the SMSF to create an accurate charging record, the AMF adds the IMEISV, the current UE Location Information (ULI) of the UE as defined in clause 5.6.2 of TS 23.501 [2] and if the UE has sent the SMS via 3GPP access, the local time zone.

When the AMF determines that the UE has the MPS for Messaging indication set (enabled) in the UE context, the AMF includes a Message Priority header to indicate priority information. Other NFs relay the priority information by including the Message Priority header in service-based interfaces, as specified in TS 29.500 [17].

2c. The SMSF invokes Namf\_Communication\_N1N2MessageTransfer service operation to forward SMS ack message to AMF.

2d. The AMF forwards the SMS ack message from the SMSF to the UE using downlink unit data message.

3-5. The SMSF checks the SMS management subscription data. If SMS delivery is allowed, the procedure defined in TS 23.040 [7] or TS 23.540 [84] applies.

6a-6b. The SMSF forwards the submit report to AMF by invoking Namf\_Communication\_N1N2MessageTransfer service operation which is forwarded to UE via Downlink NAS transport. If the SMSF knows the submit report is the last message to be transferred for UE, the SMSF shall include a last message indication in the Namf\_Communication\_N1N2MessageTransfer service operation so that the AMF knows no more SMS data is to be forwarded to UE.

NOTE: The behaviour of AMF based on the "last message indication" is implementation specific.

If the UE has more than one SMS message to send, the AMF and SMSF forwards SMS /SMS ack/submit report the same way as described in step 2a-6b.

6c-6d. When no more SMS is to be sent, UE returns a CP-ack as defined in TS 23.040 [7] to SMSF. The AMF forwards the SMS ack message by invoking Nsmsf\_SMService\_UplinkSMS service operation to SMSF.

\* \* \* \* Next change \* \* \* \*

#### 4.13.3.6 MT SMS over NAS in CM-IDLE state and RRC\_INACTIVE with CN based MT communication state via 3GPP access



Figure 4.13.3.6-1: MT SMS over NAS in CM-IDLE and RRC\_INACTIVE state via 3GPP access

1-3 MT SMS interaction between SC/SMS-GMSC/UDM follow the procedure as defined in TS 23.040 [7] or TS 23.540 [84]. If there are two AMFs serving the UE, one is for 3GPP access and another is for non-3GPP access, there are two SMSF addresses stored in UDM/UDR. The UDM shall return both SMSF addresses.

If the MPS for Messaging indication is set for the UE, the UDM may provide the parameter to the SMS-GMSC. If the MPS for Messaging indication from the UDM is set(enabled), the SMS-GMSC shall include a Message Priority header (or DRMP) to indicate priority information towards SMSF.

4. The SMSF checks the SMS management subscription data. If SMS delivery is allowed, SMSF invokes Namf\_MT\_EnableUEReachability service operation to AMF. AMF pages the UE using the procedure defined in clause 4.2.3.3. The AMF includes Paging Priority if Paging needs to be triggered and the MPS for Messaging indication is stored in the UE context. The UE responds to the page with Service Request procedure.

If the AMF indicates SMSF that UE is not reachable (including the cases that UE applies power saving enhancement as described in clause 5.31.7 of TS 23.501 [2]), the procedure of the unsuccessful Mobile terminating SMS delivery described in clause 4.13.3.9 is performed and the following steps are skipped. In the case of power saving enhancement, the AMF further stores the information received in the Namf\_MT\_EnableUEReachability request and pages the UE when UE is considered reachable.

If the UE access to the AMF via both 3GPP access and non-3GPP access, the AMF determines the Access Type to transfer the MT-SMS based on operator local policy.

5a-5b. SMSF forward the SMS message to be sent as defined in TS 23.040 [7] (i.e. the SMS message consists of CP‑DATA/RP‑DATA/TPDU/SMS‑DELIVER parts) to AMF by invoking Namf\_Communication\_N1N2MessageTransfer service operation. The AMF transfers the SMS message to the UE.

5c-5d. The UE acknowledges receipt of the SMS message to the SMSF. For uplink unitdata message toward the SMSF, the AMF invokes Nsmsf\_SMService\_UplinkSMS service operation to forward the message to SMSF. In order to permit the SMSF to create an accurate charging record, the AMF also includes IMEISV, the current UE Location Information (ULI) of the UE as defined in clause 5.6.2 of TS 23.501 [2] and if the SMS is delivered to the UE via 3GPP access, the local time zone.

6a-6b. The UE returns a delivery report as defined in TS 23.040 [7]. The delivery report is encapsulated in an NAS message and sent to the AMF which is forwarded to SMSF by invoking Nsmsf\_SMService\_UplinkSMS service operation.

6c-6d. The SMSF acknowledges receipt of the delivery report to the UE. The SMSF uses Namf\_Communication\_N1N2MessageTransfer service operation to send SMS CP ack message to the AMF. The AMF encapsulates the SMS message via a NAS message to the UE. If SMSF has more than one SMS to send, the SMSF and the AMF forwards subsequent SMS /SMS ack/ delivery report the same way as described in step 4-6c.

If the SMSF knows the SMS CP ack is the last message to be transferred for UE, the SMSF shall include a last message indication in the Namf\_Communication\_N1N2MessageTransfer service operation so that the AMF knows no more SMS data is to be forwarded to UE.

NOTE: The behaviour of AMF based on the "last message indication" is implementation specific.

7. In parallel to steps 6c and 6d, the SMSF delivers the delivery report to SC as defined in TS 23.040 [7] or TS 23.540 [84].

\* \* \* \* Next 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).  For a subscribed S-NSSAI subject to NSAC for the registered number of UE, the applicable NSAC admission mode is included as described in clause 4.2.11.5.2. |
|  | 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). |
|  | Slice Usage Policy information | Includes:  - indication the S-NSSAI is on demand; and  - slice deregistration inactivity timer value.  The AMF uses this information as described in clause 5.15.15 of TS 23.501 [2].  (NOTE 22) |
|  | 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. |
|  | Network Slice validity time information | Optionally, if the Subscribed S-NSSAI is temporarily available network slice, one validity time is associated with this 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 and each entry in the Allowed CAG list may also be associated with time validity information as defined in clause 5.30.3 of TS 23.501 [2]. |
|  | 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]. |
|  | MPS for Messaging indication | Indicates whether the user has MPS for Messaging set (enabled)/cleared (disabled) as described in clause 5.16.5 of TS 23.501 [2]. This parameter is valid only when the MPS priority parameter is set and UE is allowed to use the SMS service. |
|  | 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 and/or Credentials Holder controlled prioritized lists of preferred SNPNs and GINs for accessing Localized Services (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]. |
|  | LADN Service Area | List of Tracking Areas configured per DNN and S-NSSAI within which UE is permitted to initiate Service Request or SM signalling. |
|  | 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]. |
|  | MBSR Operation allowed | Indicates the subscriber is allowed for MBSR operation as specified in clause 5.35A.4 of TS 23.501 [2]. If present, additional location information (i.e. a list of TAIs or Area Codes that can be interpreted by AMF into TAIs ) and/or time information (including one or more time windows, and/or one or more recurring time periods) may also be present to restrict the MBSR operation to be within the location and time provided. |
|  | 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. |
|  | ODB for Packet services | Operator Determined Barring for Packet Oriented Services. See TS 23.015 [90] and TS 29.503 [52] for the handling of ODB for Packet service parameter. |
|  | QMC Configuration information | The content of QMC Configuration information (e.g. QoE reference, QoE collection entity address, etc.) is defined in TS 28.405 [92]. |
|  | NCR-Operation allowed | Indicates that the subscriber is allowed for NCR-operation as specified in clause 5.xx of TS 23.501 [2]. |
|  | AM Policy Association indicator | Indicates whether the AM Policy Association is "enabled", "disabled". |
|  | UE Policy Association indicator | Indicates whether the UE Policy Association is "enabled" or "disabled". |
| 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. |
|  | Network Slice validity time information | Optionally, if the Subscribed S-NSSAI is temporarily available network slice, one validity time is associated with this 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 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). |
|  | Additional parameters for SMF selection in target PLMN | Indicates the target PLMN identifier where SMF resource resides. |
| 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.  For a subscribed S-NSSAI subject to NSAC for the established PDU session number, the applicable NSAC admission mode is included as described in clause 4.2.11.5.2. |
|  | Subscribed DNN list | List of the subscribed DNNs for the S-NSSAI (NOTE 1). |
|  | Slice Usage Policy information | Includes:  - indication the S-NSSAI is on demand; and  - PDU Session inactivity timer value.  The SMF uses this information as described in clause 5.15.15 of TS 23.501 [2].  (NOTE 22). |
|  | ODB for Packet services | Operator Determined Barring for Packet Oriented Services. See TS 23.015 [90] and TS 29.503 [52] for the handling of ODB for Packet service parameter. |
|  | **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 of 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. |
|  | SMF-Associated Application-Specific Expected UE Behaviours parameters | Parameters characterise the foreseen behaviour of a UE for a specific application as specified in clause 4.15.6.3f. |
|  | 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 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 of TS 23.273 [51] |
| Ranging/Sidelink Positioning privacy (data needed by GMLC) | UE Ranging/SL Positioning privacy profile data | Provides information for Ranging/Sidelink Positioning privacy classes and Ranging/SL Positioning Privacy Indication (RSPI) as defined in Annex B of TS 33.533 [94]. |
| 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 of 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 | Indications for whether the UE is authorised to use the 5G ProSe service(s), including:  - use 5G ProSe Direct Discovery;  - use 5G ProSe Direct Communication;  - act as a 5G ProSe Remote UE;  - serve as a 5G ProSe UE-to-Network Relay;  - use multi-path communication via direct Uu path and via 5G ProSe Layer-2 UE-to-Network Relay as a 5G ProSe Layer-2 Remote UE;  - act as a 5G ProSe End UE; and  - serve as a 5G ProSe UE-to-UE Relay. |
|  | 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. |
|  | MBS Assistance Information | Include MBS assistance information for a UE that joins a multicast group. |
| 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 (per DNN/S-NSSAI). 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).  Optionally, one or more periods of authorized start and stop times, which indicates the allowed time period during which an AF may request time synchronization services.  Optionally, authorized Uu time synchronization error budget, which indicates the limit the AF may request.  Optionally includes information to determine whether the AF may request  - to provide clock quality metric information to the UE;  - to provide an acceptable/not acceptable indication to the UE.  Optionally includes one or more sets of the clock quality acceptance criteria for the UE that the AF may request. Clock quality acceptance criteria may be defined using TSS attributes from Table 5.27.1.12-1 of TS 23.501 [2]. |
|  | 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).  Optionally, for each PTP instance configuration, Uu time synchronization error budget. |
| Ranging/Sidelink Positioning Subscription data (see TS 23.586 [88]) | Ranging/SL Positioning Service Authorization | Indicates whether the UE is authorized to use Ranging/SL Positioning Service. |
| 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. When Session Breakout for HR Session is authorized, usage of corresponding EAS Deployment Information and AF traffic influence in VPLMN is also authorized.  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 for accessing Localized Services are associated with a time validity information and optionally a location validity information indicating the conditions allowing the UE to access to localized services in the SNPN or/and location assistance information used to aid the UE where to search for the SNPN as specified in clause 5.30.2.3 of TS 23.501 [2].  NOTE 22: Only for an S-NSSAI dedicated to a single AF is associated with Slice Usage Policy information. For roaming UE, Slice Usage Policy information does not apply. | | |

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 contains parameters defined in clause 4.15.6.3b.  In the case of DNN and S-NSSAI specific parameters in the Groups, the content of this information contains parameters defined in clause 4.15.6.3e. |
| 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 | - |
| Ranging/Sidelink Positioning 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 | - |
| Ranging/Sidelink Positioning 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 | - |

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

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