**3GPP TSG- Meeting #*****s3i230598***

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** |  | **rev** |  | **Current version:** |  |  |
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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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| ***Work item code:*** |  | | | | |  | ***Date:*** | | |  |
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| ***Category:*** |  |  | | | | | ***Release:*** | | |  |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | While reviewing the AMF records to align the MME records, multiple editorial and reference errors were found. Additionally, it was determined that some of the complex types in the tables did not have definition tables. There were also some parameters added to upstream documents that need to be added to the AMF records. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Corrections in the existing tables and addition of Tables for parameters that did not have type definition tables. Addition of missing parameters to some records and correction of some existing records. | | | | | | | | |
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| ***Consequences if not approved:*** | | The tables and parameters will still be missing or contain errors. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.2.2.2.1A, 6.2.2.2.2, 6.2.2.2.9, 6.2.2.2.10, 6.2.2.2.11 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | | The following changes made to the tables in this CR represent ASN.1 changes made in other CRs:   * Table 6.2.2.2.11.2-1: Payload for AMFRANTraceReport record includes changes made in TS 33.128 CR 0576 (S3i230523).   Common types used in tables in this CR have tables defined in TS 33.128 CR 0572 (S3i230518). | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | s3i230507 | | | | | | | | |

## \*\*\*\* START OF FIRST CHANGE (MAIN DOCUMENT) \*\*\*\*

##### 6.2.2.2.1A Simple data types for AMF

Table 6.2.2.2.1A-1: Simple types for AMF

|  |  |  |
| --- | --- | --- |
| Type name | Type | Description |
| MUSIMUERequestType | OCTET STRING (SIZE (1)) | The purpose of the MUSIMUERequestType type is to indicate a MUSIM UE has requested the network to perform specific requests due to activity on another USIM. Shall contain the UE request type information octet sent in the REGISTRAITON REQUEST message, omitting the first two octets. Encoded per TS 24.301 [51] clause 9.9.3.65. |
| RATFrequencySelectionPriority | INTEGER (1..256) | This field is used to define local configuration for RRM strategies such as camp priorities in idle mode and control of inter-RAT/inter-frequency handover in Active mode. See TS 23.501 [13] clause 5.3.4.3.1. Encoded per TS 38.413 [23] clause 6.3.1.61. |
| FiveGMMCapability | OCTET STRING (SIZE (1..13)) | The purpose of the FiveGMMCapability type is to provide information concerning aspects of the UE related to the 5GCN or interworking with the EPS. Encoded per TS 24.501 [13] clause 9.11.3.1 omitting the first two octets. |

## \*\*\*\* START OF NEXT CHANGE (MAIN DOCUMENT) \*\*\*\*

##### 6.2.2.2.2 Registration

The IRI-POI in the AMF shall generate an xIRI containing an AMFRegistration record when the IRI-POI present in the AMF detects that a UE matching one of the target identifiers provided via LI\_X1 has successfully registered to the 5GS via 3GPP NG-RAN or non-3GPP access. Accordingly, the IRI-POI in the AMF generates the xIRI when the following event is detected:

- AMF sends a N1: REGISTRATION ACCEPT message to the target UE and the UE 5G Mobility Management (5GMM) state for the access type (3GPP NG-RAN or non-3GPP access) within the AMF is changed to 5GMM-REGISTERED.

Table 6.2.2-1: Payload for AMFRegistration record

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| registrationType | AMFRegistrationType | 1 | Specifies the type of registration, see TS 24.501 [13] clause 9.11.3.7. This is derived from the information received from the UE in the REGISTRATION REQUEST message. | M |
| registrationResult | AMFRegistrationResult | 1 | Specifies the result of registration, see TS 24.501 [13] clause 9.11.3.6. | M |
| slice | Slice | 0..1 | Provide, if available, one or more of the following:  - allowed NSSAI (see TS 24.501 [13] clause 9.11.3.37).  - configured NSSAI (see TS 24.501 [13] clause 9.11.3.37).  - rejected NSSAI (see TS 24.501 [13] clause 9.11.3.46).  This is derived from the information sent to the UE in the REGISTRATION ACCEPT message. | C |
| sUPI | SUPI | 1 | SUPI associated with the registration (see clause 6.2.2.4). | M |
| sUCI | SUCI | 0..1 | SUCI used in the registration, if available. | C |
| pEI | PEI | 0..1 | PEI provided by the UE during the registration, if available. | C |
| gPSI | GPSI | 0..1 | GPSI obtained in the registration, if available as part of the subscription profile. | C |
| gUTI | FiveGGUTI | 1 | 5G-GUTI provided as outcome of initial registration or used in other cases, see TS 24.501 [13] clause 5.5.1.2.2. | M |
| location | Location | 0..1 | Location information determined by the network during the registration, if available.  Encoded as a *userLocation* parameter (*location>locationInfo>userLocation*) and, when Dual Connectivity is activated, as an *additionalCellIDs* parameter (*location>locationInfo>additionalCellIDs*), see Annex A. | C |
| non3GPPAccessEndpoint | UEEndpointAddress | 0..1 | UE's local IP address used to reach the N3IWF, TNGF or TWIF, if available. IP addresses are given as 4 octets (for IPv4) or 16 octets (for IPv6) with the most significant octet first (network byte order). | C |
| fiveGSTAIList | TAIList | 0..1 | List of tracking areas associated with the registration area within which the UE is current registered, see TS 24.501 [13] clause 9.11.3.9 (see NOTE) | C |
| sMSoverNASIndicator | SMSOverNASIndicator | 0..1 | Indicates whether SMS over NAS is supported. Provide, if included in registrationResult, see TS 24.501 [13] clause 9.11.3.6. | C |
| oldGUTI | EPS5GGUTI | 0..1 | GUTI or 5G-GUTI, if provided in the REGISTRATION REQUEST message, see TS 24.501 [13] clause 5.5.1.2.2. | C |
| eMM5GRegStatus | EMM5GMMStatus | 0..1 | UE Status, if provided in the REGISTRATION REQUEST message, see TS 24.501 [13] clause 9.11.3.56. | C |
| nonIMEISVPEI | NonIMEISVPEI | 0..1 | MACAddress or EUI-64 used as UE equipment identity if IMEI or IMEISV based PEI is not available. Provide if known, see TS 24.501 [13] clause 8.2.26.4. | C |
| mACRestIndicator | MACRestrictionIndicator | 0..1 | Indicates whether the non-IMEISV PEI MACAddress can be used as an equipment identifier. Required if non-IMEISVPEI is used, see TS 24.501 [13] clause 9.11.3.4. | C |
| pagingRestrictionIndicator | PagingRestrictionIndicator | 0..1 | Indicates if paging is restricted or the type of paging allowed. Include if sent in the REGISTRATION REQUEST message. Encoded per TS 24.501 [13] clause 9.11.3.77, omitting the first two octets. | C |
| rATType | RATType | 0..1 | RAT Type shall be present if known by the AMF. RAT Type is determined by the AMF during registration. See TS 23.501 [2] clause 5.3.2.3 | C |
| rRCEstablishmentCause | RRCEstablishmentCause | 0..1 | Indicates the reason for UE RRC Connection Establishment. This parameter shall be populated with information provided by the serving RAN during NAS establishment in the Initial UE Message. See TS 38.413 [23] clause 9.3.1.111. | C |
| nGInformation | NGInformation | 0..1 | Provides application layer related information for the serving Global RAN Node provided by the NG-RAN node to the serving AMF during NG setup. This parameter shall be populated using information from the NG SETUP REQUEST and NG SETUP RESPONSE. See TS 38.413 [23] clauses 9.2.6.1 and 9.2.6.2. | C |
| nASTransportInitialInformation | NASTransportInitialInformation | 0..1 | Provides information related to the NAS Transport setup for the target UE over the NG interface. Shall be included when received by the AMF per TS 38.413 [23]. This parameter is only conditional for backward compatibility. See TS 38.413 [23] clause 9.2.5.1. | C |
| equivalentPLMNList | PLMNList | 0..1 | Provides a list of equivalent PLMNs in the REGISTRATION ACCEPT message. See clause TS 24.501 [13] clause 8.2.7.3. | C |
| fiveGMMCapability | FiveGMMCapability | 0..1 | Shall contain the target 5GMM capability information octets sent in the REGISTRATION REQUEST message, omitting the first two octets. Defined in TS 24.501 [13] clause 9.11.3.1. | C |
| initialRANUEContextSetup | InitialRANUEContextSetup | 0..1 | Provides information sent in the INITIAL CONTEXT SETUP message from the AMF to the RAN for a target. See TS 38.413 [23] clause 9.2.2.1. | C |
| mUSIMUERequestType | MUSIMUERequestType | 0..1 | Indicates a MUSIM UE has requested release of NAS signalling or has rejected paging. Include if sent in the REGISTRATION REQUEST message. Encoded per UE Request Type omitting the first two octets. See TS 24.301 [51] clause 9.9.3.65. | C |
| sORTransparentContainer | SORTransparentContainer | 0..1 | Provides the list of preferred PLMN/access technology combinations. Included if sent in the NAS N1 message REGISTRATION ACCEPT. Given as a SoR Transparent container encoded per TS 24.501 [13] clause 9.11.3.51 omitting the first three octets. | C |
| NOTE: List shall be included each time there is a change to the registration area. | | | | |

## \*\*\*\* START OF NEXT CHANGE (MAIN DOCUMENT) \*\*\*\*

##### 6.2.2.2.3 Deregistration

The IRI-POI in the AMF shall generate an xIRI containing an AMFDeregistration record when the IRI-POI present in the AMF detects that a UE matching one of the target identifiers provided via LI\_X1 has deregistered from the 5GS over at least one access type. Accordingly, the IRI-POI in AMF generates the xIRI when any of the following events is detected:

- For network initiated de-registration, when the AMF receives the N1: DEREGISTRATION ACCEPT message from the target UE or when implicit deregistration timer expires; and in both cases the UE 5GMN state for the access type (3GPP NG-RAN or non-3GPP access) within the AMF is changed to 5GMM-DEREGISTERED.

- For UE initiated de-registration, when the AMF sends the N1: DEREGISTRATION ACCEPT message to the target UE or when the AMF receives the N1: DEREGISTRATION REQUEST message from the target UE with deregistration type value of “switch off”; and in both cases the UE 5GMN state for the access type (3GPP NG-RAN or non-3GPP access) within the AMF is changed to 5GMM-DEREGISTERED.

- For network initiated AMF UE relocation, the AMFDeregistration xIRI shall not be sent unless the 5GMM COMMON PROCEDURE INITIATED (see TS 24.501 [13] clause 5.1.3.2.3.3) results in deregistration.

Table 6.2.2-2: Payload for AMFDeregistration record

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| deregistrationDirection | AMFDirection | 1 | Indicates whether the deregistration was initiated by the network or by the UE. | M |
| accessType | AccessType | 1 | Indicates the access for which the deregistration is handled, see TS 24.501 [13] clause 9.11.3.20. | M |
| sUPI | SUPI | 0..1 | SUPI associated with the deregistration (see clause 6.2.2.4), if available. | C |
| sUCI | SUCI | 0..1 | SUCI used in the deregistration, if available (see NOTE). | C |
| pEI | PEI | 0..1 | PEI used in the deregistration, if available (see NOTE). | C |
| gPSI | GPSI | 0..1 | GPSI associated to the deregistration, if available as part of the subscription profile. | C |
| gUTI | FiveGGUTI | 0..1 | 5G-GUTI used in the deregistration, if available, see TS 24.501 [13] clause 5.5.2.2.1 (see NOTE). | C |
| cause | FiveGMMCause | 0..1 | Indicates the 5GMM cause value for network-initiated deregistration, see TS 24.501 [13] clause 9.11.3.2. | C |
| location | Location | 0..1 | Location information determined by the network during the deregistration, if available.  Encoded as a *userLocation* parameter (*location>locationInfo>userLocation*), see Annex A. | C |
| switchOffIndicator | SwitchOffIndicator | 0..1 | Indicates whether the deregistration type is normal or switch off, if available, see TS 24.501 [13] clause 9.1.3.20.1. | C |
| reRegRequiredIndicator | ReRegRequiredIndicator | 0..1 | Indicates whether UE re-registration is required in the DEREGISTRATION REQUEST message, if available, see TS 24.501 [13] clause 9.1.3.20.1. | C |
| NOTE: At least one among SUCI, PEI and GUTI shall be provided. | | | | |

##### 6.2.2.2.4 Location update

The IRI-POI in the AMF shall generate an xIRI containing an AMFLocationUpdate record each time the IRI-POI present in an AMF detects that the target’s UE location is updated due to target UE mobility or as a part of an AMF service procedure and the reporting of location information is not restricted by service scoping. The generation of such separate xIRI is not required if the updated UE location information is obtained as a part of a procedure producing some other xIRIs (e.g. mobility registration). In that case the location information is included into the respective xIRI.

The UE mobility events resulting in generation of an AMFLocationUpdate xIRI include the *N2 Path Switch Request* (*Xn based inter NG-RAN handover* procedure described in TS 23.502 [4] clause 4.9.1.2) and the *N2 Handover Notify* (*Inter NG-RAN node N2 based handover* procedure described in TS 23.502 [4] clause 4.9.1.3).

The AMFLocationUpdate xIRI is also generated when the AMF receives an NG-RAN NGAP *PDU Session Resource Modify Indication* message as a result of Dual Connectivity activation/release for the target UE, as described in TS 37.340 [37] clause 10.

Optionally, based on operator policy, other NG-RAN NGAP messages that do not generate separate xIRI but carry location information (e.g. RRC INACTIVE TRANSITION REPORT) may trigger the generation of an xIRI AMFLocationUpdate record.

Additionally, based on regulatory requirements and operator policy, the location information obtained by AMF from NG-RAN or LMF in the course of some service operation (e.g. emergency services, LCS) may generate xIRI AMFLocationUpdate record. The AMF services providing the location information in these cases include the AMF Location Service (ProvideLocInfo, ProvidePosInfo, NotifiedPosInfo and EventNotify service operations) and the AMF Exposure Service (AmfEventReport with LOCATION\_REPORT) (see TS 29.518 [22]). Additionally, the AMF Communication Service (Namf\_Communication\_N1MessageNotify service operation) may be monitored to capture the location information in the scenarios described in TS 23.273 [42] clause 6.3.1. Also, in the case of Mobile Originated LCS service invoked by the target, the location information may be derived from a Nlmf\_Location\_DetermineLocation Response to AMF (see TS 23.273 [42] clause 6.2).

The AMFLocationUpdate record is also used by LARF to deliver Location Acquisition responses to MDF2, as described in clause 7.3.5.6. The IRI-POI in the AMF shall not generate the AMFLocationUpdate xIRI when the location is acquired as the result of a LARF request, as described in TS 33.127 [5], clause 7.3.5.2.

Table 6.2.2-3: Payload for AMFLocationUpdate record

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| sUPI | SUPI | 1 | SUPI associated with the location update (see clause 6.2.2.4). | M |
| sUCI | SUCI | 0..1 | SUCI associated with the location update, if available, see TS 24.501 [13]. | C |
| pEI | PEI | 0..1 | PEI associated with the location update, if available. | C |
| gPSI | GPSI | 0..1 | GPSI associated with the location update, if available as part of the subscription profile. | C |
| gUTI | FiveGGUTI | 0..1 | 5G-GUTI associated with the location update, if available, see TS 24.501 [13]. | C |
| location | Location | 1 | Updated location information determined by the network.  Depending on the service or message type from which the location information is extracted, it may be encoded in several forms (Annex A):  1) as a *userLocation* parameter (*location>locationInfo>userLocation*) in the case the information is obtained from an NGAP message, except the LOCATION REPORT message (see TS 38.413 [23]);  2) as a *locationInfo* parameter (*location>locationInfo*) in the case the information is obtained from a **ProvideLocInfo** (TS 29.518 [22] clause 6.4.6.2.6);  3) as a *locationPresenceReport* parameter (*location>locationPresenceReport*) in the case the information is obtained from an **AmfEventReport** (TS 29.518 [22] clause 6.2.6.2.5) with event type **Location-Report** or **Presence-In-AOI-Report;**  4) as a *positionInfo* parameter (*location>positioningInfo>positionInfo*) in the case the information is obtained from a **ProvidePosInfo** (TS 29.518 [22] clause 6.4.6.2.3) or a **NotifiedPosInfo** (TS 29.518 [22] clause 6.4.6.2.4). | M |
| sMSoverNASIndicator | SMSOverNASIndicator | 0..1 | No longer used in present version of this specification. | C |
| oldGUTI | EPS5GGUTI | 0..1 | No longer used in present version of this specification. | C |

##### 6.2.2.2.5 Start of interception with registered UE

The IRI-POI in the AMF shall generate an xIRI containing an AMFStartOfInterceptionWithRegisteredUE record when the IRI-POI present in the AMF detects that interception is activated on a UE that has already been registered in the 5GS (see clause 6.2.2.4 on identity privacy). A UE is considered already registered to the 5GS when the 5GMM state for the access type (3GPP NG-RAN or non-3GPP access) for that UE is 5GMM-REGISTERED. Therefore, the IRI-POI present in the AMF shall generate the xIRI AMFStartOfInterceptionWithRegisteredUE record when it detects that a new interception for a UE is activated (i.e. provisioned by the LIPF) and the 5G mobility management state for the access type (3GPP NG-RAN or non-3GPP access) within the AMF for that UE is 5GMM-REGISTERED. If the UE is registered over both 3GPP NG-RAN and non-3GPP access, the IRI-POI present in the AMF shall generate an xIRI containing an AMFStartOfInterceptionWithRegisteredUE record for each access type.

Table 6.2.2-4: Payload for AMFStartOfInterceptionWithRegisteredUE record

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O | | |
| registrationResult | AMFRegistrationResult | 1 | Specifies the result of registration, see TS 24.501 [13] clause 9.11.3.6. | M | | |
| registrationType | AMFRegistrationType | 0..1 | Specifies the type of registration, see TS 24.501 [13] clause 9.11.3.7, if available. | C | | |
| slice | Slice | 0..1 | Provide, if available, one or more of the following:  - allowed NSSAI (see TS 24.501 [13] clause 9.11.3.37).  - configured NSSAI (see TS 24.501 [13] clause 9.11.3.37). | C | | |
| sUPI | SUPI | 1 | SUPI associated with the target UE. | M | | |
| sUCI | SUCI | 0..1 | SUCI used in the registration, if available. | C | | |
| pEI | PEI | 0..1 | PEI associated with the target UE, if available. | C | | |
| gPSI | GPSI | 0..1 | GPSI associated with the target UE, if available. | C | | |
| gUTI | FiveGGUTI | 1 | Latest 5G-GUTI assigned to the target UE by the AMF. | M | | |
| location | Location | 0..1 | Location information associated with the access type for the target UE, if available.  Encoded as a *userLocation* parameter (*location>locationInfo>userLocation*) and, when Dual Connectivity is activated, as an *additionalCellIDs* parameter (*location>locationInfo>additionalCellIDs*), see Annex A. | C | | |
| non3GPPAccessEndpoint | UEEndpointAddress | 0..1 | UE's local IP address used to reach the N3IWF, TNGF or TWIF, if available. IP addresses are given as 4 octets (for IPv4) or 16 octets (for IPv6) with the most significant octet first (network byte order). | C | | |
| timeOfRegistration | Timestamp | 0..1 | Time at which the last registration occurred, if available. This is the time stamp when the REGISTRATION ACCEPT message was sent to the UE or (when applicable) when the REGISTRATION COMPLETE was received from the UE.  Shall be given qualified with time zone information (i.e. as UTC or offset from UTC, not as local time). | C | | |
| fiveGSTAIList | TAIList | 0..1 | List of tracking areas associated with the target UE for the access type. | C | | |
| sMSoverNASIndicator | SMSOverNASIndicator | 0..1 | Indicates whether SMS over NAS is supported. Provide, if included in the UE Context. | C | | |
| oldGUTI | EPS5GGUTI | 0..1 | Latest GUTI or 5G-GUTI received from the target UE if different than the latest GUTI assigned by the AMF and the target UE has not acknowledged the latest GUTI assignment. | C | | |
| eMM5GRegStatus | EMM5GMMStatus | 0..1 | UE Status, if this parameter can be derived from information available in the UE Context at the AMF. | C | | |
| sORTransparentContainer | SORTransparentContainer | 0..1 | Provides the list of preferred PLMN/access technology combinations. Included if sent in the NAS N1 message REGISTRATION ACCEPT. Given as a SoR Transparent container encoded per TS 24.501 [13] clause 9.11.3.51 omitting the first three octets. | C | |
| uEPolicy | UEPolicy | 0..1 | Content of the N1 NAS message MANAGE UE POLICY COMMAND, as defined in TS 24.501 [13] table D.5.1.1.1. | C |
| NOTE: The values of the parameters in the table above are derived from the UE Context at the AMF, see TS 23.502 clause 5.2.2.2.2. | | | | | | |

The IRI-POI present in the AMF generating an xIRI containing an AMFStartOfInterceptionWithRegisteredUE record shall set the Payload Direction field in the PDU header to *not applicable* (Direction Value 5, see ETSI TS 103 221-2 [8] clause 5.2.6).

##### 6.2.2.2.6 AMF unsuccessful procedure

The IRI-POI in the AMF shall generate an xIRI containing an AMFUnsuccessfulProcedure record when the IRI-POI present in the AMF detects an unsuccessful procedure for a UE matching one of the target identifiers provided via LI\_X1.

Accordingly, the IRI-POI in the AMF generates the xIRI when any of the following events is detected:

- AMF sends a N1: REGISTRATION REJECT message to the target UE and the UE 5G Mobility Management (5GMM) state for the access type (3GPP NG-RAN or non-3GPP access) within the AMF is changed to 5GMM-DEREGISTERED.

- AMF aborts a registration procedure before the UE 5G Mobility Management (5GMM) state for the access type (3GPP NG-RAN or non-3GPP access) within the AMF is changed to 5GMM-REGISTERED.

- AMF sends a SERVICE REJECT message to the target UE including a PDU session establishment reject message type.

- AMF aborts a UE-initiated NAS transport procedure with payload container type IE set to "SMS".

Unsuccessful registration shall be reported only if the target UE has been successfully authenticated.

Table 6.2.2-5: Payload for AMFUnsuccessfulProcedure record

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| failedprocedureType | AMFFailedProcedureType | 1 | Specifies the procedure which failed at the AMF. | M |
| failureCause | AMFFailureCause | 1 | Provides the value of the 5GSM or 5GMM cause, see TS 24.501 [13] clauses 9.11.3.2 and 9.11.4.2. | M |
| requestedSlice | NSSAI | 0..1 | Slice requested for the procedure, if available, given as a NSSAI (a list of S-NSSAI values as described in TS 24.501 [13] clause 9.11.3.37). | C |
| sUPI | SUPI | 0..1 | SUPI associated with the procedure, if available (see NOTE). | C |
| sUCI | SUCI | 0..1 | SUCI used in the procedure, if applicable and if available (see NOTE). | C |
| pEI | PEI | 0..1 | PEI used in the procedure, if available (see NOTE). | C |
| gPSI | GPSI | 0..1 | GPSI used in the procedure, if available (see NOTE). | C |
| gUTI | FiveGGUTI | 0..1 | 5G-GUTI used in the procedure, if available, see TS 24.501 [13] clause 9.11.3.4 (see NOTE). | C | |
| location | Location | 0..1 | Location information determined during the procedure, if available.  Encoded as a *userLocation* parameter (*location>locationInfo>userLocation*), see Annex A. | C |
| NOTE: At least one identity shall be provided, the others shall be provided if available. | | | | |

##### 6.2.2.2.7 AMF identifier association

The IRI-POI present in the AMF shall generate an xIRI containing an AMFIdentifierAssociation record when the IRI-POI present in the AMF detects a new identifier association for a UE matching one of the target identifiers provided via LI\_X1. Generation of this record is subject to this record type being enabled for a specific target (see clause 6.2.2.2.1).

Table 6.2.2-6: Payload for AMFIdentifierAssociation record

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| sUPI | SUPI | 1 | SUPI associated with the procedure (see NOTE 1). | M |
| sUCI | SUCI | 0..1 | SUCI used in the procedure, if applicable and if available. | C |
| pEI | PEI | 0..1 | PEI used in the procedure, if available (see NOTE 1). | C |
| gPSI | GPSI | 0..1 | GPSI used in the procedure, if available (see NOTE 1). | C |
| gUTI | FiveGGUTI | 1 | 5G-GUTI used in the procedure, see TS 24.501 [13] clause 9.11.3.4. | M | |
| location | Location | 1 | Location information available when identifier association occurs.  Encoded as a *userLocation* parameter (*location>locationInfo>userLocation*) and, when Dual Connectivity is activated, as an *additionalCellIDs* parameter (*location>locationInfo>additionalCellIDs*), see Annex A. | M |
| fiveGSTAIList | TAIList | 0..1 | List of tracking areas associated with the registration area within which the UE is current registered, see TS 24.501 [13], clause 9.11.3.9. (see NOTE 2) | C |
| NOTE 1: SUPI shall always be provided, in addition to the warrant target identifier if different to SUPI. Other identifiers shall be provided if available.  NOTE 2: List shall be included each time there is a change to the registration area. | | | | |

The IRI-POI present in the AMF generating an xIRI containing an AMFIdentifierAssociation record shall set the Payload Direction field in the PDU header to *not applicable* (Direction Value 5, see ETSI TS 103 221-2 [8] clause 5.2.6).

##### 6.2.2.2.8 Positioning info transfer

The IRI-POI present in the AMF shall generate an xIRI containing an AMFPositioningInfoTransfer when the IRI-POI present in the AMF detects one of the following events :

- an NRPPa (see TS 38.455 [86]) message related to a target UE has been exchanged between the LMF and NG-RAN via the AMF.

- a LPP (see TS 37.355 [85]) message related to a target UE has been exchanged between the LMF and the target UE via the AMF.

Accordingly, the IRI-POI in AMF generates the xIRI when any of the following events is detected:

- AMF receives an Namf\_Communication\_N1N2MessageTransfer (see TS 29.518 [22]) from LMF to request the transfer of a NRPPa request to the serving NG-RAN node for a target UE as part of a UE associated NRPPa positioning activity. The NRPPa request may be E-CID MEASUREMENT INITIATION REQUEST or OTDOA INFORMATION REQUEST.

- AMF sends a Namf\_Communication\_N2InfoNotify [22] to the LMF to forward the NRPPa response or report received from the NG-RAN for a target UE. The NRPPa response or report may be E-CID MEASUREMENT INITIATION RESPONSE, E-CID MEASUREMENT REPORT or OTDOA INFORMATION RESPONSE.

- AMF receives an Namf\_Communication\_N1N2MessageTransfer ([22]) from LMF to request the transfer of a LPP message to a target UE as part of a LPP positioning activity.

- AMF sends an Namf\_Communication\_N1MessageNotify ([22]) to LMF to forward a LPP message received from the target UE.

Table 6.2.2.2.8-1: Payload for AMFPositioningInfoTransfer record

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| sUPI | SUPI | 1 | SUPI associated with the procedure (see NOTE 1 in table 6.2.2-6). | M |
| sUCI | SUCI | 0..1 | SUCI used in the procedure, if applicable and if available. | C |
| pEI | PEI | 0..1 | PEI used in the procedure, if available (see NOTE 1 in table 6.2.2-6). | C |
| gPSI | GPSI | 0..1 | GPSI used in the procedure, if available (see NOTE 1 in table 6.2.2-6). | C |
| gUTI | FiveGGUTI | 0..1 | 5G-GUTI used in the procedure, see TS 24.501 [13] clause 9.11.3.4. | C | |
| nRPPaMessage | OCTET STRING | 0..1 | Any UE associated NRPPa message exchanged between the LMF and NG-RAN via AMF. | C |
| lPPMessage | OCTET STRING | 0..1 | Any LPP message exchanged between the LMF and the target UE via AMF. | C |
| lcsCorrelationId | UTF8String (SIZE(1..255)) | 1 | LCS correlation ID (see TS 29.572 [24] clause 6.1.6.3.2) related to a location session, found in the Namf\_CommunicationN1N2MessageTransfer and corresponding Namf\_Communication\_N2InfoNotify or Namf\_CommunicationN1MessageNotify. All the AMFPositioningInfoTransfer records related to the same location session have the same lcsCorrelationId. | M |

##### 6.2.2.2.9 Handovers

6.2.2.2.9.1 General

The present clause provides the LI requirements for NG interface-based handovers which occur for a target UE. Such handovers may be intra 5GS (inter-gNB), 5GS to EPS (inter-system), EPS to 5GS (inter-system), or 5GS to UTRA (inter-system).

The following xIRI records are used to report handover related events between the AMF and RAN nodes for the target UE when the delivery of location information is not restricted by service scoping:

- AMFRANHandoverCommand.

- AMFRANHandoverRequest.

The above xIRIs are used to report handover events and information that are not carried in the AMFLocationUpdate (clause 6.2.2.2.4) record and shall include the information transferred between the AMF and RAN nodes, as a part of handover preparation, resource allocation, and handover notification.

6.2.2.2.9.2 Handover command

The IRI-POI in the AMF shall generate an xIRI containing an AMFRANHandoverCommand record when the IRI-POI present in the AMF detects that the AMF has sent a HANDOVER COMMAND message to the source RAN node (old RAN node) in response to a HANDOVER REQUIRED message for the target UE and location information is not restricted by service scoping.

Table 6.2.2.2.9.2-1: Payload for AMFRANHandoverCommand record

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| userIdentifiers | UserIdentifiers | 1 | List of identifiers, including the target identifier, associated with the target UE registration stored in the AMF context. See TS 29.518 [22] clause 6.1.6.2.25 and TS 23.502 [4] clause 4.11.2.2. | M |
| aMFUENGAPID | AMFUENGAPID | 1 | Identity that the AMF uses to uniquely identify the target UE over the NG Interface. See TS 38.413 [23] clause 9.3.3.1. This is correlated to the SUPI known in the UE AMF context. | M |
| rANUENGAPID | RANUENGAPID | 1 | Identity that the AMF receives from the NG-RAN node uniquely identifying the target UE with the NG-RAN Node. See TS 38.413 [23] clause 9.3.3.2. | M |
| handoverType | HandoverType | 1 | Identifies the type of handover indicated by the source RAN node to the AMF. See TS 38.413 [23] clause 9.3.1.22. | M |
| targetToSourceContainer | RANTargetToSourceContainer | 1 | Provides radio related information about the gaining RAN node. See TS 38.413 [23] clause 9.3.1.21. | M |

6.2.2.2.9.3 Handover request

The IRI-POI in the AMF shall generate an xIRI containing an AMFRANHandoverRequest record when the IRI-POI in the AMF detects that the AMF received a HANDOVER REQUEST ACKNOWLEDGE message from the target RAN node (new RAN node) for the target UE and location information is not restricted by service scoping.

NOTE: The gaining RAN node sends the HANDOVER REQUEST ACKNOWLEDGE in response to a HANDOVER REQUEST from the AMF.

Table 6.2.2.2.9.3-1: Payload for AMFRANHandoverRequest record

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| userIdentifiers | UserIdentifiers | 1 | List of user identifiers associated with the target UE registration stored in the AMF context. See TS 29.518 [22] clause 6.1.6.2.25 and TS 23.502 [4] clause 4.11.2.2. | M |
| aMFUENGAPID | AMFUENGAPID | 1 | Identity that the AMF uses to uniquely identify the target UE over the NG Interface, See TS 38.413 [23] clause 9.3.3.1. This is correlated to the SUPI known in the UE AMF context. | M |
| rANUENGAPID | RANUENGAPID | 1 | Identity that the AMF receives from the NG-RAN node uniquely identifying the target UE within the NG-RAN Node. See TS 38.413 [23] clause 9.3.3.2. | M |
| handoverType | HandoverType | 1 | Identifies the type of handover indicated by the AMF to gaining RAN Node as seen in the HANDOVER REQUEST message. See TS 38.413 [23] clause 9.3.1.22. | M |
| handoverCause | HandoverCause | 1 | Indicates the cause of handover as seen in the HANDOVER REQUEST message from AMF to gaining RAN node. See TS 38.413 [23] clause 9.3.1.2. | M |
| pDUSessionResourceInformation | PDUSessionResourceInformation | 1 | Indicates the PDU Session to be transferred and Handover Command Transfer information as seen in the HANDOVER REQUEST and confirmed in the HANDOVER REQUEST ACKNOWLEDGE message. See TS 38.413 [23] clauses 9.3.1.50 and 9.3.4.10. | M |
| mobilityRestrictionList | MobilityRestrictionList | 0..1 | Provides roaming or access restrictions related to mobility from AMF to gaining RAN Node. Include if sent in HANDOVER REQUEST. See TS 38.413 [23] clause 9.3.1.85. | C |
| locationReportingRequestType | LocationReportingRequestType | 0..1 | Indicates the type of location reporting requested in the HANDOVER REQUEST. Include if in HANDOVER REQUEST message. See TS 38.413 [23] clause 9.3.1.65. | C |
| targetToSourceContainer | RANTargetToSourceContainer | 1 | Provides radio related information from gaining to losing NG-RAN node that the AMF receives from the gaining RAN Node in the HANDOVER REQUEST ACKNOWLEDGE message. See TS 38.413 [23] clause 9.3.1.21. | M |
| nPNAccessInformation | NPNAccessInformation | 0..1 | Globally identifies the secondary NG-RAN node CAG Cells. Include if sent in the HANDOVER REQUEST ACKNOWLEDGE message from gaining RAN node to AMF. See TS 38.413 [23] clause 9.3.3.46. | C |
| rANSourceToTargetContainer | RANSourceToTargetContainer | 1 | Provides radio related information via the AMF in the HANDOVER REQUEST from source to gaining NG-RAN node. See TS 38.413 [23] clause 9.3.1.21. | M |

## \*\*\*\* START OF NEXT CHANGE (MAIN DOCUMENT) \*\*\*\*

##### 6.2.2.2.10 UE Configuration Update

The IRI-POI in the AMF shall generate an xIRI containing a AMFUEConfigurationUpdate record when the IRI-POI present in the AMF detects that a UE matching one of the target identifiers provided via LI\_X1 has been commanded to update its configuration. Accordingly, the IRI-POI in the AMF generates the xIRI when the following event is detected:

- AMF sends a CONFIGURATION UPDATE COMMAND message to the target UE.

Table 6.2.2.2.10-1: Payload for AMFUEConfigurationUpdate record

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| userIdentifiers | UserIdentifiers | 1 | List of identifiers, including the target identifier, associated with the target UE registration stored in the AMF context. See TS 29.518 [22]clause 6.1.6.2.25. | M |
| gUTI | GUTI | 1 | Current 5G-GUTI associated with the UE context. If the AMF includes a new 5G-GUTI as a part of the configuration update, this parameter shall be set to the new GUTI and the oldGUTI parameter shall be populated, see TS 24.501 [13] clause 8.2.19.3. | M |
| oldGUTI | EPS5GGUTI | 0..1 | Old 5G-GUTI associated with the UE context. If the AMF includes a new 5G-GUTI as a part of the configuration update, this parameter shall be set to the old GUTI. | C |
| fiveGSTAIList | TAIList | 0..1 | List of tracking areas associated with the registration area within which the UE is current registered, see TS 24.501 [13] clause 9.11.3.9. Shall be included each time there is a change to the registration area and omitted if the registration area does not change. | C |
| slice | Slice | 0..1 | Provide, if available, one or more of the following:  - allowed NSSAI (see TS 24.501 [13] clause 9.11.3.37).  - configured NSSAI (see TS 24.501 [13] clause 9.11.3.37).  - rejected NSSAI (see TS 24.501 [13] clause 9.11.3.46).  This is derived from the information sent to the UE in the CONFIGURATION UPDATE COMMAND message. | C |
| serviceAreaList | ServiceAreaList | 0..1 | Includes a list of allowed service areas or non-allowed service areas, encoded per TS 24.501 [13] clause 9.11.3.49, omitting the first two octets. Shall be included if present in the CONFIGURATION UPDATE COMMAND message, see TS 24.501 [13] clause 8.2.19. | C |
| registrationResult | AMFRegistrationResult | 0..1 | Specifies the result of registration, see TS 24.501 [13] clause 9.11.3.6. Shall be included if present in the CONFIGURATION UPDATE COMMAND message, see TS 24.501 [13] clause 8.2.19. | C |
| sMSoverNASIndicator | SMSOverNASIndicator | 0..1 | Indicates whether SMS over NAS is supported. Shall be present if the SMS indication is present in the CONFIGURATION UPDATE COMMAND message, see TS 24.501 [13] clause 8.2.19. | C |

## \*\*\*\* START OF NEXT CHANGE (MAIN DOCUMENT) \*\*\*\*

##### 6.2.2.2.11 Trace

###### 6.2.2.2.11.1 General

Trace procedures, as defined in TS 32.423 [112], allow for the AMF to request trace sessions, including Minimization of Drive Test (MDT) data gathering for a target using UE-associated signalling.

The present clause provides the LI requirements for reporting trace sessions from the IRI-POI in the AMF for a target UE.

The following xIRI records are used to report trace related events between the AMF and RAN nodes for the target UE when the delivery of location information is not restricted by service scoping:

- AMFRANTraceReport

###### 6.2.2.2.11.2 AMF RAN trace report

The IRI-POI in the AMF shall generate an xIRI containing an AMFRANTraceReport record when the IRI-POI present in the AMF has detected any of the following events:

- AMF sent a TRACE START message to the target RAN node (old RAN node) in response to a Trace Session Activation message for the target.

- AMF received a CELL TRAFFIC TRACE message from the NG-RAN for the target.

- AMF sent MDT or trace data to the trace collection entity for the target.

- AMF sent a deactivate trace message to the NG-RAN for the target.

**Table 6.2.2.2.11.2-1: Payload for AMFRANTraceReport record**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Cardinality** | **Description** | **M/C/O** |
| userIdentifiers | UserIdentifiers | 1 | List of identifiers, including the target identifier, associated with the target UE registration stored in the AMF context. See TS 29.518 [22]clause 6.1.2.25. | M |
| aMFUENGAPID | AMFUENGAPID | 1 | Identity that the AMF uses to uniquely identify the target UE over the NG Interface. See TS 38.413 [23] clause 9.3.3.1. This is correlated to the SUPI known in the UE AMF context. | M |
| rANUENGAPID | RANUENGAPID | 1 | Identity that the AMF receives from the NG-RAN node uniquely identifying the target UE with the NG-RAN Node. See TS 38.413 [23] clause 9.3.3.2. | M |
| traceRecordType | TraceRecordType | 1 | Identifies the type of trace record being generated. This parameter is populated with either Trace Start, Cell Traffic Trace, Trace Data Delivery, or Trace Deactivation. | M |
| traceDirection | TraceDirection | 1 | Identifies which network element is signalling the trace information. This parameter is populated with a choice of either AMF or NG-RAN. See TS 38.413 [23] clause 9.2.10.4 | M |
| deprecatedTraceActivationInfo | TraceActivationInfo | 0 | No longer used in present version of this specification. Use traceActivation instead. | O |
| nGRANCGI | NCGI | 1 | Identifies the NR-RAN Cell Global Identifier of the cell performing the UE trace. | M |
| globalRANNodeID | GlobalRANNodeID | 1 | Uniquely identifies the NG-RAN node to which the TRACE START message is sent. This is derived from the initial NG Setup exchange between the NG-RAN node and the AMF. | M |
| traceCollectionEntityInfo | TraceCollectionEntityInfo | 0..1 | Provides information related to the trace collection entity to which the AMF sends the MDT or Trace data of the target. Shall be populated if the Trace Record Type is set to Trace Data Delivery. See TS 38.413 [23] clause 9.3.2.4. and 9.3.2.14. | C |
| aMFTraceData | XMLType | 1 | Includes the trace data (in raw XML format) sent from the AMF to the trace collection entity when the AMF is the trace collection NE. See TS 32.423 [112] clauses 4.18 and 5.2. | M |
| location | Location | 0..1 | Shall be provided if the current location is known in the UE context at the AMF or supplemented by the MDF2. | C |
| traceActivation | TraceActivation | 0..1 | Information related to a trace session activation provided from the AMF to the NG-RAN node. Shall be populated if the traceRecordType is set to Trace Start.  The *ExternalASNType.encodedASNValue.alignedPer* choice shall be used when populating this type and it shall be populated with the contents of the Trace Activation IE defined in TS 38.413 [23] clause 9.3.1.14, | C |

**Table 6.2.2.2.11.2-2: Payload for traceCollectionEntityInfo Parameter**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Cardinality** | **Description** | **M/C/O** |
| traceCollectionEntityIP | BIT STRING (SIZE(1..160, …)) | 1 | Indicates the transport layer address of the trace collection entity. May include IPv4, IPv6, or IPv4 and IPv6 addresses. Encoded per TS 38.414 [113] clause 5.3. | M |
| traceCollectionEntityURI | UTF8String | 1 | Indicates the URI of the trace collection entity. Include if sent in the TRACE START message. If the TRACE START message does not include a traceCollectionEntityURI, this parameter shall be sent as an empty string. See TS 38.413 [23] clause 9.3.1.14. | M |

## \*\*\*\* END OF ALL CHANGES \*\*\*\*