**3GPP TSG- Meeting #**

**, , -**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  |  | **CR** |  | **rev** |  | **Current version:** |  |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** |  | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** |  | | | | | | | | | |
| ***Source to TSG:*** |  | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** |  | | | | |  | ***Date:*** | | |  |
|  |  | | | |  | |  | | |  |
| ***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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Following release 15, support for many features originally developed for 5GS have been added to EPS. In some cases, these features are limited only to interworked systems, however in many cases, support for these features and services has been enabled in standalone EPS networks. TS 33.108 does not support reporting these features, and would require extensive ongoing work to enable this reporting. The majority of these features are covered in TS 33.128 for interworked systems already, so this CR proposes updating the solutions to also support non-interworked systems. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Enables the use of the existing PDN Connection ASN.1 structures as xIRI and IRI messages to allow for reporting of standalone EPS. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | It will not be possible to report post release 15 service events from non-interworked EPS. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.3.1, 6.3.3.0, 6.3.3.2, 6.3.3.4, Attachment TS33128Payloads.asn | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | | CR 0716 is the Release 19 mirror for this CR.  Schema changes for this CR can be found on the Forge:  Merge Request: [!308](https://forge.3gpp.org/rep/sa3/li/-/merge_requests/308)  Commit Hash: [e35fd1a6b5815d35ab04a9228f61c6253aef54ab](https://forge.3gpp.org/rep/sa3/li/-/merge_requests/308/diffs?commit_id=e35fd1a6b5815d35ab04a9228f61c6253aef54ab) | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | s3i250032, s3i250050, s3i250053 | | | | | | | | |

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

6.2.3.1.1 General

If the warrant is for IRI and CC, then the IRI-POI and the CC-TF in the SMF shall be provisioned in accordance with clause 6.2.3.1.2, the MDF2 shall be provisioned in accordance with clause 6.2.3.1.3, and the MDF3 shall be provisioned in accordance with clause 6.2.3.1.4.

If the warrant is for IRI only, the IRI-POI in the SMF shall be provisioned in accordance with clause 6.2.3.1.2 and the MDF2 shall be provisioned in accordance with clause 6.2.3.1.3.

If approach 1 described in clause 6.2.3.9 is used for packet header information reporting, the IRI-TF in the SMF shall be provisioned in accordance with clause 6.2.3.1.2 and the MDF2 shall be provisioned in accordance with clause 6.2.3.1.3. If approach 2 described in clause 6.2.3.9 is used for packet header information reporting, the CC-TF in the SMF shall be provisioned in accordance with clause 6.2.3.1.2, the MDF2 shall be provisioned in accordance with clause 6.2.3.1.3, and the MDF3 shall be provisioned in accordance with clause 6.2.3.1.4.

In implementations that support EPS/5GS interworking, the SMF in the clauses below refers to the SMF+PGW-C and the requirements in clause 6.3.3 shall apply to EPS PDN connections.

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

6.2.3.2 Generation of xIRI at IRI-POI in SMF over LI\_X2

6.2.3.2.1 General

The IRI-POI present in the SMF shall send the xIRIs over LI\_X2 for each of the events listed in TS 33.127 [5] clause 6.2.3.3, the details of which are described in the following clauses. In implementations that support EPS/5GS interworking , the EPS PDN connection related events specified in clause 6.3.3.2 shall also be generated. The IRI-POI present in the SMF shall also send a SeparatedLocationReporting xIRI (as described in clause 7.3.4.1) when the IRI-POI provisioned in the H-SMF detects that the V-SMF has sent location data via the HsmfUpdateData service operation to the H-SMF that does not otherwise trigger an existing SMF record type.

As specified in TS 23.501 [2] clause 5.6.1, a PDU session may support either a single-access PDU Connectivity Service (referred to as a single-access PDU Session) or a multi-access PDU Connectivity Service (referred to as a Multi-Access PDU (MA PDU) session).

The details of the messages for single-access PDU sessions are provided below in clauses 6.2.3.2.2, 6.2.3.2.3, 6.2.3.2.4, 6.2.3.2.5 and 6.2.3.2.6.

The details of the messages for multi-access PDU sessions are provided below in clauses 6.2.3.2.7 and 6.2.3.2.8.

6.2.3.2.2 PDU session establishment

The IRI-POI in the SMF shall generate an xIRI containing an SMFPDUSessionEstablishment record when the IRI-POI present in the SMF detects that a single-access PDU session has been established for the target UE. The IRI-POI present in the SMF shall generate the xIRI for the following events:

- The SMF creates a new PDU Session context or SM Context for the target UE (see TS 29.502 [16] clause 5.2.2.2 and clause 5.2.2.7).

If the Npcf\_SMPolicyControl\_Create response received from the PCF for the target UE in response to Npcf\_SMPolicyControl\_Create request includes PCC rules in which the traffic control policy data contains either a routeToLocs IE or trafficSteeringPolIdDl IE and/or trafficSteeringPolIdUl IE, then the SMF shall include those PCC rules in the xIRI. These PCC rules correspond to policies that influence the target UE’s traffic flows (see TS 29.513 [88] clause 5.5.3).

**Table 6.2.3-1: Payload for SMFPDUSessionEstablishment record**

| **Field name** | **Type** | **Cardinality** | **Description** | **M/C/O** |
| --- | --- | --- | --- | --- |
| sUPI | SUPI | 0..1 | SUPI associated with the PDU session (e.g. as provided by the AMF in the associated Nsmf\_PDU\_Session\_CreateSMContext service operation). Shall be present except for PEI-only unauthenticated emergency sessions (see NOTE). | C |
| sUPIUnauthenticated | SUPIUnauthenticatedIndication | 0..1 | Shall be present if a SUPI is present in the message and set to “true” if the SUPI has not been authenticated, or “false” if it has been authenticated. | C |
| pEI | PEI | 0..1 | PEI associated with the PDU session, if available (see NOTE). | C |
| gPSI | GPSI | 0..1 | GPSI associated with the PDU session, if available (see NOTE). | C |
| pDUSessionID | PDUSessionID | 1 | PDU Session ID. See TS 24.501 [13] clause 9.4. | M |
| gTPTunnelID | FTEID | 1 | Contains the F-TEID identifying the UPF endpoint of the GTP tunnel used to encapsulate the traffic derived from the UL NG-U UP TNL Information (see TS 38.413 clause 9.3.4.1), as defined in TS 29.244 [15] clause 8.2.3. Non-GTP encapsulation is for further study. | M |
| pDUSessionType | PDUSessionType | 1 | Identifies selected PDU session type, see TS 24.501 [13] clause 9.11.4.11. | M |
| sNSSAI | SNSSAI | 0..1 | Slice identifiers associated with the PDU session, if available. See TS 23.003 [19] clause 28.4.2 and TS 23.501 [2] clause 5.15.2. | C |
| uEEndpoint | SEQUENCE OF UEEndpointAddress | 0..MAX | UE endpoint address(es) assigned to the PDU Session, if available (see TS 29.244 [15] clause 5.21). | 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 |
| location | Location | 0..1 | Location information provided by the AMF or present in the context at the SMF, if available. | C |
| dNN | DNN | 1 | Data Network Name requested by the target UE, as defined in TS 23.003[19] clause 9A and described in TS 23.502 [4] clause 4.3.2.2. Shall be given in dotted-label presentation format as described in TS 23.003 [19] clause 9.1. | M |
| aMFID | AMFID | 0..1 | Identifier of the AMF associated with the target UE, as defined in TS 23.003 [19] clause 2.10.1 if available. | C |
| hSMFURI | HSMFURI | 0..1 | URI of the Nsmf\_PDUSession service of the selected H-SMF, if available. See TS 29.502 [16] clause 6.1.6.2.2. | C |
| requestType | FiveGSMRequestType | 1 | Type of request as described in TS 24.501 [13] clause 9.11.3.47 provided within the Nsmf\_PDU\_Session\_CreateSMContext Request (TS 29.502 [16]) message shall be reported.  In the case where the network does not support Multi Access (MA) PDU sessions, but receives a MA PDU session request, a request type of “Initial request” shall be reported.  In the case where the network does not provide a request type value for a non-MA PDU session, a request type of “initial request”, according to TS 24.501 [13] clause 6.4.1.2 shall be reported. | M |
| accessType | AccessType | 0..1 | Access type associated with the session (i.e. 3GPP or non-3GPP access) if provided by the AMF (see TS 24.501 [13] clause 9.11.2.1A). | C |
| rATType | RATType | 0..1 | RAT Type associated with the access if provided by the AMF as part of session establishment (see TS 23.502 [4] clause 4.3.2). Values given as per TS 29.571 [17] clause 5.4.3.2. | C |
| sMPDUDNRequest | SMPDUDNRequest | 0..1 | Contents of the SM PDU DN Request container, if available, as described in TS 24.501 [13] clause 9.11.4.15. | C |
| uEEPSPDNConnection | UEEPSPDNConnection | 0..1 | This IE shall be present, if available, during an EPS to 5GS Idle mode mobility or handover using the N26 interface. If present, it shall contain the EPS bearer context(s) information present in the uEEPSPDNConnection parameter of the intercepted SmContextCreateData message. (see TS 29.502 [16] clause 6.1.6.2.2). | C |
| ePS5GSComboInfo | EPS5GSComboInfo | 0..1 | Provides detailed information about PDN Connections associated with the reported PDU Session. Shall be included if the AMF has selected a SMF+PGW-C to serve the PDU session. This parameter shall include the additional IEs in Table 6.2.3-1A, if present. | C |
| selectedDNN | DNN | 0..1 | Shall be present if a DNN other than the UE requested DNN is selected for the PDU Session. Shall be given in dotted-label presentation format as described in TS 23.003 [19] clause 9.1. | C |
| servingNetwork | SMFServingNetwork | 0..1 | PLMN ID of the serving core network operator, and, for a Non-Public Network (NPN), the NID that together with the PLMN ID identifies the NPN. Shall be present if this IE is in the SMContextCreateData or PDUSessionCreateData message sent to the SMF or the PDU Session Context or SM Context at the SMF (see TS 29.502 [16] clauses 6.1.6.2.2, 6.1.6.2.9 and 6.1.6.2.39). | C |
| oldPDUSessionID | PDUSessionID | 0..1 | Shall be present if this IE is in the SMContextCreateData or PDUSessionCreateData message sent to the SMF or the PDU Session Context or SM Context at the SMF (see TS 29.502 [16] clauses 6.1.6.2.2, 6.1.6.2.9 and 6.1.6.2.39). | C |
| handoverState | HandoverState | 0..1 | Indicates whether the PDU Session Establishment being reported was due to a handover. Shall be present if this IE is in the SMContextCreatedData sent by the SMF (see TS 29.502 [16] clause 6.1.6.2.3). | C |
| gTPTunnelInfo | GTPTunnelInfo | 1 | Contains the information for the User Plane GTP Tunnels for the PDU Session (see TS 29.502 [16] clauses 6.1.6.2.2, 6.1.6.2.9 and 6.1.6.2.39). See Table 6.2.3-1B. | M |
| pCCRules | PCCRuleSet | 0..1 | Set of PCC rules related to traffic influence. Each PCC rule influences the routing of a given traffic flow. If several flows are concerned, then several PCC rules shall be handled by the SMF. Traffic influence policies are originated by an AF. PCF translates these rules into PCC rules for traffic influence. The payload of a PCC rule for traffic influence is defined in Table 6.2.3-1E. | C |
| deprecatedEPSPDNConnectionEstablishment | EPSPDNConnectionEstablishment | 0..1 | No longer used in the present version of this specification. | C |
| satelliteBackhaulCategory | SBIType | 0..1 | Indicates that a satellite backhaul is used towards 5G AN and the corresponding backhaul category, if available. Encoded according to TS 29.571 [17] clause 5.4.3.39. The SBIReference for this parameter shall be populated with 'TS29571\_CommonData.yaml#/components/schemas/SatelliteBackhaulCategory'. | C |
| gEOSatelliteID | GEOSatelliteID | 0..1 | Indicates the satellite ID if satellite backhaul category is GEO, if available. Encoded according to TS 29.571 [17] clause 5.4.2. | C |
| NOTE: At least one of the SUPI, PEI or GPSI fields shall be present. | | | | |

**Table 6.2.3-1A: Payload for ePS5GSComboInfo**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Cardinality** | **Description** | **M/C/O** |
| ePSInterworkingIndication | EPSInterworkingIndication | 1 | Indicates whether and how the PDU Session may be moved to EPS. Shall be derived from the EpsInterworkingIndication associated with the PDU Session at the SMF+PGW-C (see TS 29.502 [16] clause 6.1.6.3.11). | M |
| ePSSubscriberIDs | EPSSubscriberIDs | 1 | Includes the Subscriber Identities associated with the EPS PDN Connection in the UE Context sent from the MME to the AMF or known in the context at the SMF+PGW-C. See TS 29.274 [87] clause 7.2.1 and TS 23.502 [4] clause 4.11.1. | M |
| ePSPdnCnxInfo | EPSPDNCnxInfo | 0..1 | Shall be present if there are any EPS PDN connections associated to the PDU Session in the SM Context or PDU Session Context at the SMF+PGW-C. Contains information about the EPS PDN connection associated with the PDU Session. See TS 29.502 [16] clause 6.1.6.2.31. | C |
| ePSBearerInfo | EPSBearerInfo | 0..1 | Shall be present if there are any EPS Bearers associated to the PDU Session in the SM Context or PDU Session Context at the SMF+PGW-C. Contains information about the EPS Bearer context(s) associated with the PDU Session. See TS 29.502 [16] clause 6.1.6.2.4. | C |

**Table 6.2.3-1B: Payload for gTPTunnelInfo field**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Cardinality** | **Description** | **M/C/O** |
| fiveGSGTPTunnels | FiveGSGTPTunnels | 0..1 | Shall include the 5GS GTP Tunnels (see Table 6.2.3-1C) when the xIRI message is used to report PDU Session related events. | C |
| ePSGTPTunnels | EPSGTPTunnels | 0..1 | Shall include the information for the User Plane GTP Tunnels for the bearer context if present in the Request or Response (see TS 29.274 [87] clauses 7.2.2, 7.2.4 and 8.15) or known at the context at the SGW or PGW (see TS 23.401 [50] clause 5.6.4) when the xIRI message is used to report PDN Connection related events. See Table 6.3.3-6. | C |

**Table 6.2.3-1C: Payload for fiveGSGTPTunnels field**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Cardinality** | **Description** | **M/C/O** |
| uLNGUUPTunnelInformation | FTEID | 0..1 | Shall include the F-TEID for the UPF endpoint of the NG-U transport bearer (see TS 38.413 [23] clause 9.3.4.1). | C |
| additionalULNGUUPTunnelInformation | FTEIDList | 0..1 | Shall include the F-TEID for the UPF endpoint of any additional NG-U transport bearers (see TS 38.413 [23] clause 9.3.4.1). | C |
| dLRANTunnelInformation | DLRANTunnelInformation | 0..1 | Shall include the RAN tunnel and QOS Flow information for the PDU Session (see TS 29.502 [16] clause 6.1.6.2.39 and TS 38.413 [23] clause 9.3.4.1). See Table 6.2.3-1D. | C |

**Table 6.2.3-1D: Payload for dLRANTunnelInformation field**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Cardinality** | **Description** | **M/C/O** |
| dLQOSFlowTunnelInformation | QOSFlowTunnelInformation | 0..1 | Shall include the F-TEID NG-RAN endpoint of the NG-U transport bearer together with associated QoS flows (see TS 38.413 [23] clause 9.3.4.2 and TS 29.502 [16] clause 6.1.6.2.39). | C |
| additionalDLQOSFlowTunnelInformation | QOSFlowTunnelInformationList | 0..1 | Shall include the F-TEID NG-RAN endpoint of any additional NG-U transport bearers together with associated QoS flows (see TS 38.413 [23] clause 9.3.4.2 and TS 29.502 [16] clause 6.1.6.2.39). | C |
| redundantDLQOSFlowTunnelInformation | QOSFlowTunnelInformationList | 0..1 | Shall include the F-TEID NG-RAN endpoint of redundant NG-U transport bearers together with associated QoS flows (see TS 38.413 [23] clause 9.3.4.2 and TS 29.502 [16] clause 6.1.6.2.39). | C |
| additionalredundantDLQOSFlowTunnelInformation | QOSFlowTunnelInformationList | 0..1 | Shall include the F-TEID NG-RAN endpoint of any additional redundant NG-U transport bearers together with associated QoS flows (see TS 38.413 [23] clause 9.3.4.2 and TS 29.502 [16] clause 6.1.6.2.39). | C |

Each PCC rule for traffic influence has the payload defined in Table 6.2.3-1E.

**Table 6.2.3-1E: Payload of PCCRule for traffic influence**

|  |  |  |
| --- | --- | --- |
| **Field name** | **Description** | **M/C/O** |
| pCCRuleID | Policy rule identifier. This IE is defined in TS 29.512 [89] table 5.6.2.6-1. | M |
| appId | Identifies an application (NOTE 1), if available. This IE is defined in TS 29.512 [89] table 5.6.2.6-1 (NOTE 1). | C |
| pFD | Packet flow description (PFD) associated with the appId, if available. It is defined in TS 29.551 [96] table 5.6.2.5-1 (NOTE 1). | C |
| flowInfos | A set of flow information, if available. A flow information is an Ethernet or IP flow packet filter information (NOTE 1). This IE is defined in TS 29.512 [89] table 5.6.2.6-1 (NOTE 1). FlowInfos may be IP flow or Ethernet flow. IP flow is specified in TS 29.214, section 5.3.8 [92]. Ethernet Flow is specified in TS 29.514 [91] table 5.6.2.17-1. | C |
| appReloc | Indicates that the application cannot be relocated once a location of the application is selected by the 5GC when it is included and set to "true". The default value is "false". | C |
| simConnInd | Indication of simultaneous connectivity temporarily maintained for the source and target PSA (PDU Session Anchor). If it is included and set to "true", temporary simultaneous connectivity should be kept. The default value "false" applies, if the IE is not present. This IE is defined in TS 29.512 [89] table 5.6.2.9-1. | C |
| simConnTerm | Indication of the minimum time interval to be considered for inactivity of the traffic routed via the source PSA during the edge re-location procedure. It may be included when the "simConnInd" attribute is set to true. This IE is defined in TS 29.512 [89] table 5.6.2.9-1. | C |
| maxAllowedUpLat | Indicates the target user plane latency in units of milliseconds used by SMF to decide whether edge relocation is needed to ensure that the user plane latency does not exceed the value. This IE is defined in TS 29.512 [89] table 5.6.2.9-1, if available. | C |
| routeToLocs | A set of traffic routes, if available. A traffic route provides information to route to/from a DNAI. This IE is defined in TS 29.512 [89] table 5.6.2.9-1 (NOTE 2). | C |
| trafficSteeringPolIdDl | Traffic steering policy for downlink traffic at the SMF, if available. This IE is defined in TS 29.512 [89] table 5.6.2.9-1 (NOTE 2). | C |
| trafficSteeringPolIdUl | Traffic steering policy for uplink traffic at the SMF, if available. This IE is defined in TS 29.512 [89] table 5.6.2.9-1 (NOTE 2). | C |
| deprecatedSourceDNAI | No longer used in present version of this specification | O |
| deprecatedTargetDNAI | No longer used in present version of this specification | O |
| deprecatedDNAIChangeType | No longer used in present version of this specification | O |
| deprecatedSourceUEIPAddress | No longer used in present version of this specification | O |
| deprecatedTargetUEIPAddress | No longer used in present version of this specification | O |
| eASIPReplaceInfos | Contains EAS IP replacement information for a Source and a Target EAS, if available. This IE is defined in TS 29.571 [17] table 5.4.4.79. | C |
| NOTE 1: Either appId/pFD or flowInfos shall be supplied.  NOTE 2: TrafficSteeringPolIdDl attribute and/or trafficSteeringPolIdUl attribute and routeToLocs attribute are mutually exclusive. | | |

6.2.3.2.3 PDU session modification

The IRI-POI in the SMF shall generate an xIRI containing an SMFPDUSessionModification record when the IRI-POI present in the SMF detects that a single-access PDU session has been modified for the target UE. The IRI-POI present in the SMF shall generate the xIRI for the following events:

- The SMF modifies an existing PDU Session context or SM Context for the target UE (see TS 29.502 [16] clauses 5.2.2.3 and 5.2.2.8).

In the case of interworked EPS/5GS, the IRI-POI in the SMFP shall also generate an xIRI containing an SMFPDUSessionModification record (see clause 6.2.3.2.3) e for the following events:

- The SMF+PGW-C transfers an existing PDU Session to EPS (see TS 23.502 [4] clauses 4.11.1.2.1 and 4.11.2.2).

- The SMF+PGW-C transfers an existing PDN Connection to 5GS (see TS 23.502 [4] clauses 4.11.1.2.2 and 4.11.2.3).

If the Npcf\_SMPolicyControlUpdateNotify response sent to the PCF for the target UE in response to an Npcf\_SMPolicyControlUpdateNotify request includes PCC rules in which the traffic control policy data contains either a routeToLocs IE or trafficSteeringPolIdDl IE and/or trafficSteeringPolIdUl IE, then the SMF shall include those PCC rules in the xIRI. These PCC rules correspond to policies that influence the target UE’s traffic flows (see TS 29.513 [88] clause 5.5.3).

**Table 6.2.3-2: Payload for SMFPDUSessionModification record**

| **Field name** | **Type** | **Cardinality** | **Description** | **M/C/O** |
| --- | --- | --- | --- | --- |
| sUPI | SUPI | 0..1 | SUPI associated with the PDU session (e.g. as provided by the AMF in the associated Nsmf\_PDU\_Session\_CreateSMContext service operation). Shall be present except for PEI-only unauthenticated emergency sessions. | C |
| sUPIUnauthenticated | SUPIUnauthenticatedIndication | 0..1 | Shall be present if a SUPI is present in the message and set to “true” if the SUPI was not authenticated, or “false” if it has been authenticated. | C |
| pEI | PEI | 0..1 | PEI associated with the PDU session, if available. | C |
| gPSI | GPSI | 0..1 | GPSI associated with the PDU session, if available. | C |
| sNSSAI | SNSSAI | 0..1 | Slice identifier associated with the PDU session, if available. See TS 23.003 [19] clause 28.4.2 and TS 23.501 [2] clause 5.15.2. | 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 |
| location | Location | 0..1 | Location information provided by the AMF or present in the context at the SMF, if available. | C |
| requestType | FiveGSMRequestType | 0..1 | Type of request as described in TS 24.501 [13] clause 9.11.3.47, if available. | C |
| accessType | AccessType | 0..1 | Access type associated with the session (i.e. 3GPP or non-3GPP access) if provided by the AMF (see TS 24.501 [13] clause 9.11.2.1A). | C |
| rATType | RATType | 0..1 | RAT type associated with the access, if available. Values given as per TS 29.571 [17] clause 5.4.3.2. | C |
| pDUSessionID | PDUSessionID | 0..1 | PDU Session ID, see TS 24.501 [13] clause 9.4. Shall be provided. This parameter is conditional only for backwards compatibility. | C |
| ePS5GSComboInfo | EPS5GSComboInfo | 0..1 | Provides detailed information about PDN Connections associated with the reported PDU Session. Shall be included when the AMF has selected a SMF+PGW-C to serve the PDU session. This parameter may include the additional IEs in Table 6.2.3-1A, if available. | C |
| uEEndpoint | UEEndpointAddress | 0..1 | UE IP address(es) assigned to the PDU Session, if available (see TS 29.244 [15] clause 5.21). | C |
| servingNetwork | SMFServingNetwork | 0..1 | Shall be present if this IE is in the SMContextUpdateData, HsmfUpdateData or message sent to the SMF or the PDU Session Context or SM Context at the SMF (see TS 29.502 [16] clauses 6.1.6.2.3, 6.1.6.2.11 and 6.1.6.2.39). | C |
| handoverState | HandoverState | 0..1 | Indicates whether the PDU Session Modification being reported was due to a handover. Shall be present if this IE is in the SMContextUpdatedData or sent by the SMF (see TS 29.502 [16] clause 6.1.6.2.3). | C |
| gTPTunnelInfo | GTPTunnelInfo | 1 | Contains the information for the User Plane GTP Tunnels for the PDU Session (see TS 29.502 [16] clauses 6.1.6.2.2, 6.1.6.2.9 and 6.1.6.2.39). See Table 6.2.3-1B. | M |
| pCCRules | PCCRuleSet | 0..1 | Set of PCC rules related to traffic influence. Each PCC rule influences the routing of a given traffic flow. If several flows are concerned, then several PCC rules shall be handled by the SMF. Traffic influence policies are originated by an AF. PCF translates these rules into PCC rules for traffic influence, if available. The payload of a PCC rule for traffic influence is defined in Table 6.2.3-1E. | C |
| deprecatedEPSPDNConnectionModification | EPSPDNConnectionModification | 0..1 | No longer used in the present version of this specification. | C |
| uPPathChange | UPPathChange | 0..1 | Notification of the UPPathChange event. This IE is defined in TS 29.508 [90], if available, see table 5.6.2.5-1. | C |
| pFDDataForApp | PFDDataForApp | 0..1 | Represents the packet flow descriptions (PFDs) for an application identifier (AppId), if available. This IE is defined in TS 29.551 [96] table 5.6.2.2-1. | C |
| satelliteBackhaulCategory | SBIType | 0..1 | Indicates that a satellite backhaul is used towards 5G AN and the corresponding backhaul category, if available. Encoded according to TS 29.571 [17] clause 5.4.3.39. The SBIReference for this parameter shall be populated with 'TS29571\_CommonData.yaml#/components/schemas/SatelliteBackhaulCategory'. | C |
| gEOSatelliteID | GEOSatelliteID | 0..1 | Indicates the satellite ID if satellite backhaul category is GEO, if available. Encoded according to TS 29.571 [17] clause 5.4.2. | C |

**Table 6.2.3-2A: Payload of UPPathChange**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Cardinality** | **Description** | **M/C/O** |
| sourceDNAI | DNAI | 0..1 | Source DNAI, if the DNAI has changed. DNAI represents the location of applications towards which the traffic routing should apply, if available. | C |
| targetDNAI | DNAI | 0..1 | Target DNAI if the DNAI has changed. | C |
| dNAIChangeType | DNAIChangeType | 0..1 | Type of a DNAI change. Possible values are “early”, “late” and “earlyAndLate” notification of UP path reconfiguration, if available. | C |
| sourceUEIPAddress | IPAddress | 0..1 | The IPv4 Address of the served UE for the source DNAI, if available. | C |
| targetUEIPAddress | IPAddress | 0..1 | The IPv4 Address of the served UE for the target DNAI, if available. | C |
| sourceTrafficRouting | RouteToLocation | 0..1 | N6 traffic routing information for the source DNAI, if available. | C |
| targetTrafficRouting | RouteToLocation | 0..1 | N6 traffic routing information for the target DNAI, if available. | C |
| mACAddress | MACAddress | 0..1 | The MAC address of the served UE, if available. | C |

**Table 6.2.3-2B: Payload of PFDDataForApp**

|  |  |  |
| --- | --- | --- |
| **Field name** | **Description** | **M/C/O** |
| appId | Identifier of an application. | M |
| pFDs | PFDs for an application identifier, if available. PFD is defined in TS 29.551 [96] table 5.6.2.5-1. | C |

**Table 6.2.3-2C: Payload of PFD**

|  |  |  |
| --- | --- | --- |
| **Field name** | **Description** | **M/C/O** |
| pFDId | PFD identifier. | M |
| pFDflowDescription | Represents a set of 3-tuple with protocol, server IP address and server port for UL/DL application traffic, if available. | C |
| uRLs | Represents a set of URL, if available. | C |
| domainNames | Represents a set of FQDN, if available. | C |
| dnProtocol | Indicates the additional protocol and protocol field for domain names to be matched, if available. This IE is defined in 29.122 [63] table 5.14.2.2.4-1. | C |

6.2.3.2.4 PDU session release

The IRI-POI in the SMF shall generate an xIRI containing an SMFPDUSessionRelease record when the IRI-POI present in the SMF detects that a single-access PDU session has been released. The IRI-POI present in the SMF shall generate the xIRI for the following events:

- The SMF releases an existing PDU Session context or SM Context for the target UE (see TS 29.502 [16] clause 5.2.2.4 and clause 5.2.2.9).

**Table 6.2.3-3: Payload for SMFPDUSessionRelease record**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Cardinality** | **Description** | **M/C/O** |
| sUPI | SUPI | 1 | SUPI associated with the PDU session. | M |
| pEI | PEI | 0..1 | PEI associated with the PDU session if available. | C |
| gPSI | GPSI | 0..1 | GPSI associated with the PDU session if available. | C |
| pDUSessionID | PDUSessionID | 1 | PDU Session ID as assigned by the AMF. | M |
| timeOfFirstPacket | Timestamp | 0..1 | Time of first packet for the PDU session. | C |
| timeOfLastPacket | Timestamp | 0..1 | Time of last packet for the PDU session. | C |
| uplinkVolume | INTEGER | 0..1 | Number of uplink octets for the PDU session. | C |
| downlinkVolume | INTEGER | 0..1 | Number of downlink octets for the PDU session. | C |
| location | Location | 0..1 | Location information, if available. | C |
| cause | SMFErrorCodes | 0..1 | Indicates the NF Service Consumer cause for the requested PDU session release (see TS 29.502 [16] clause 6.1.6.3.8 for enumerated cause information). Include if known. | C |
| ePS5GSComboInfo | EPS5GSComboInfo | 0..1 | Provides detailed information about PDN Connections associated with the reported PDU Session. This parameter may include the additional IEs in Table 6.2.3-1A, when available. | C |
| nGAPCause | NGAPCauseInt | 0..1 | Indicates the NGAP cause for the requested SM context release (see TS 29.502 [16] clause 6.1.6.2.6). Shall be derived as described in TS 29.571 [17] clause 5.4.4.12. | C |
| fiveGMMCause | FiveGMMCause | 0..1 | Indicates the 5GMM cause for a PDU Session released due to any 5GMM failure (see 29.502 [16] clause 6.1.6.2.6). Shall be sent as an integer derived as described in TS 29.571 [17] clause 5.4.2. | C |
| pCCRuleIDs | PCCRuleIDSet | 0..1 | PCC rule IDs of the PCC rules related to traffic influence that are associated to the PDU session and active at the time the PDU session is released. | C |
| deprecatedEPSPDNConnectionRelease | EPSPDNConnectionRelease | 0..1 | No longer used in the present version of this specification. | C |

6.2.3.2.5 Start of interception with an established PDU session

The IRI-POI in the SMF shall generate an xIRI containing an SMFStartOfInterceptionWithEstablishedPDUSession record when the IRI-POI present in the SMF detects that a single-access PDU session has already been established for the target UE when interception starts. The IRI-POI present in the SMF shall generate the xIRI for the following events:

- The SMF has an existing PDU Session context or SM Context for the target UE (see TS 29.502 [16] clause 5.2.2.2 and clause 5.2.2.7).

The IRI-POI in the SMF shall generate the xIRI containing the SMFStartOfInterceptionWithEstablishedPDUSession record for each of the PDU sessions (that meets the above criteria) associated with the newly identified target UEs.

**Table 6.2.3-4: Payload for SMFStartOfInterceptionWithEstablishedPDUSession record**

| **Field name** | **Type** | **Cardinality** | **Description** | **M/C/O** |
| --- | --- | --- | --- | --- |
| sUPI | SUPI | 0..1 | SUPI associated with the PDU session (e.g. as provided by the AMF in the associated Nsmf\_PDU\_Session\_CreateSMContext service operation). Shall be present except for PEI-only unauthenticated emergency sessions. | C |
| sUPIUnauthenticated | SUPIUnauthenticatedIndication | 0..1 | Shall be present if a SUPI is present in the message and set to “true” if the SUPI has not been authenticated, or “false” if it has been authenticated. | C |
| pEI | PEI | 0..1 | PEI associated with the PDU session, if available. | C |
| gPSI | GPSI | 0..1 | GPSI associated with the PDU session, if available. | C |
| pDUSessionID | PDUSessionID | 1 | PDU Session ID as assigned by the AMF, as defined in TS 24.007 [14] clause 11.2.3.1b. | M |
| gTPTunnelID | FTEID | 1 | Contains the F-TEID identifying the UPF endpoint of the GTP tunnel used to encapsulate the traffic derived from the UL NG-U UP TNL Information (see TS 38.413 clause 9.3.4.1), as defined in TS 29.244 [15] clause 8.2.3. Non-GTP encapsulation is for further study. | M |
| pDUSessionType | PDUSessionType | 1 | Identifies selected PDU session type, see TS 24.501 [13] clause 9.11.4.11. | M |
| sNSSAI | SNSSAI | 0..1 | Slice identifier associated with the PDU session, if available. See TS 23.003 [19] clause 28.4.2 and TS 23.501 [2] clause 5.15.2. | C |
| uEEndpoint | SEQUENCE OF UEEndpointAddress | 0..N | UE endpoint address(es) 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). MAC addresses are given as 6 octets with the most significant octet first (see TS 29.244 [15] clause 5.21). | 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 |
| location | Location | 0..1 | Location information provided by the AMF at session establishment or present in the context at the SMF, if available. | C |
| dNN | DNN | 1 | Data Network Name associated with the target traffic, as defined in TS 23.003 [19] clause 9A and described in TS 23.502 [4] clause 4.3.2.2. Shall be given in dotted-label presentation format as described in TS 23.003 [19] clause 9.1. | M |
| aMFID | AMFID | 0..1 | Identifier of the AMF associated with the target UE, as defined in TS 23.003 [19] clause 2.10.1, if available. | C |
| hSMFURI | HSMFURI | 0..1 | URI of the Nsmf\_PDUSession service of the selected H-SMF, if available. See TS 29.502 [16] clause 6.1.6.2.2. | C |
| requestType | FiveGSMRequestType | 1 | Type of request as initially set within the PDU SESSION ESTABLISHMENT as described in TS 24.501 [13] clause 9.11.3.47. If the initial value is no longer available the request type shall be set to “existing PDU session”. | M |
| accessType | AccessType | 0..1 | Access type associated with the session (i.e. 3GPP or non-3GPP access) if provided by the AMF (see TS 24.501 [13] clause 9.11.2.1A). | C |
| rATType | RATType | 0..1 | RAT type associated with the access if provided by the AMF as part of session establishment (see TS 23.502 [4] clause 4.3.2). Values given as per TS 29.571 [17] clause 5.4.3.2. | C |
| sMPDUDNRequest | SMPDUDNRequest | 0..1 | Contents of the SM PDU DN request container, if available, as described in TS 24.501 [13] clause 9.11.4.15. | C |
| timeOfSessionEstablishment | Timestamp | 0..1 | Time at which the session establishment occurred, if available. Shall be given qualified with time zone information (i.e. as UTC or offset from UTC, not as local time). | C |
| ePS5GSComboInfo | EPS5GSComboInfo | 0..1 | Provides detailed information about PDN Connections associated with the reported PDU Session. Shall be included when the AMF has selected a SMF+PGW-C to serve the PDU session. This parameter may include the additional IEs in table 6.2.3-1A, if available. | C |
| uEEPSPDNConnection | UEEPSPDNConnection | 0..1 | This IE shall be present, if available, during an EPS to 5GS Idle mode mobility or handover using the N26 interface. If present, it shall contain the EPS bearer context(s) information present in the uEEPSPDNConnection parameter of the intercepted SmContextCreateData message. (see TS 29.502 [16] clause 6.1.6.2.2). | C |
| servingNetwork | SMFServingNetwork | 0..1 | Indicates the serving core network operator PLMN, and for an SNPN, the NID. Shall be present if present in the PDU Session Context or SM Context at the SMF (see TS 29.502 [16] clause 6.1.6.2.39). | C |
| gTPTunnelInfo | GTPTunnelInfo | 1 | Contains the information for the User Plane GTP Tunnels for the PDU Session (see TS 29.502 [16] clauses 6.1.6.2.2, 6.1.6.2.9 and 6.1.6.2.39). See Table 6.2.3-1B. | M |
| pCCRules | PCCRuleSet | 0..1 | Set of PCC rules related to traffic influence. Each PCC rule influences the routing of a given traffic flow. If several flows are concerned, then several PCC rules shall be handled by the SMF. Traffic influence policies are originated by an AF. PCF translates these rules into PCC rules for traffic influence. The payload of a PCC rule for traffic influence is defined in Table 6.2.3-1E. | C |
| deprecatedEPSStartOfInterceptionWithEstablishedPDNConnection | EPSStartOfInterceptionWithEstablishedPDNConnection | 0..1 | No longer used in the present version of this specification. | C |
| pFDDataForApps | PFDDataForApps | 0..1 | Represents a set of associations between application identifier and packet flow descriptions (PFDs), if available. | C |
| satelliteBackhaulCategory | SBIType | 0..1 | Indicates that a satellite backhaul is used towards 5G AN and the corresponding backhaul category, if available. Encoded according to TS 29.571 [17] clause 5.4.3.39. The SBIReference for this parameter shall be populated with 'TS29571\_CommonData.yaml#/components/schemas/SatelliteBackhaulCategory'. | C |
| gEOSatelliteID | GEOSatelliteID | 0..1 | Indicates the satellite ID if satellite backhaul category is GEO, if available. Encoded according to TS 29.571 [17] clause 5.4.2. | C |

The IRI-POI present in the SMF generating an xIRI containing a SMFStartOfInterceptionWithEstablishedPDUSession 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).

6.2.3.2.6 SMF unsuccessful procedure

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

Accordingly, the IRI-POI in the SMF generates the xIRI when one of the following events are detected:

- SMF sends a PDU SESSION ESTABLISHMENT REJECT message to the target UE.

- SMF sends a PDU SESSION MODIFICATION REJECT message to the target UE.

- SMF sends a PDU SESSION RELEASE REJECT message to the target UE.

- SMF receives a PDU SESSION MODIFICATION COMMAND REJECT message from the target UE.

- An ongoing SM procedure is aborted at the SMF, due to e.g. a 5GSM STATUS message sent from or received by the SMF.

**Table 6.2.3-5: Payload for SMFUnsuccessfulProcedure record**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Cardinality** | **Description** | **M/C/O** |
| failedProcedureType | SMFFailedProcedureType | 1 | Specifies the procedure which failed or is aborted at the SMF. | M |
| failureCause | FiveGSMCause | 1 | Provides the value of the 5GSM cause, see TS 24.501 [13] clause 9.11.4.2. In case the procedure is aborted due to a 5GSM STATUS message, the 5GSM cause is the one included in the 5GSM status message. | M |
| initiator | Initiator | 1 | Specifies whether the network (SMF) or the UE is initiating the rejection or indicating the failure. | 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 |
| sUPIUnauthenticated | SUPIUnauthenticatedIndication | 0..1 | Shall be present if a SUPI is present in the message and set to “true” if the SUPI has not been authenticated, or “false” if it has been authenticated. | 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 |
| pDUSessionID | PDUSessionID | 0..1 | PDU Session ID See clause 9.4 of TS 24.501 [13], if available. | C |
| uEEndpoint | SEQUENCE OF UEEndpointAddress | 0..MAX | UE endpoint address(es) if available. | C |
| non3GPPAccessEndpoint | UEEndpointAddress | 0..1 | UE's local IP address used to reach the N3IWF, TNGF or TWIF, if available. | C |
| dNN | DNN | 0..1 | Data Network Name associated with the target traffic, as defined in TS 23.003 [19] clause 9A and described in TS 23.501 [2] clause 4.3.2.2, if available. Shall be given in dotted-label presentation format as described in TS 23.003 [19] clause 9.1. | C |
| aMFID | AMFID | 0..1 | Identifier of the AMF associated with the target UE, as defined in TS 23.003 [19] clause 2.10.1 when available. | C |
| hSMFURI | HSMFURI | 0..1 | URI of the Nsmf\_PDUSession service of the selected H-SMF, if available. See TS 29.502 [16] clause 6.1.6.2.2. | C |
| requestType | FiveGSMRequestType | 0..1 | Type of request as described in TS 24.501 [13] clause 9.11.3.47, if available.  Otherwise depending on the REJECT event the following request type shall be reported: PDU SESSION ESTABLISHMENT REJECT: The request type shall be set to the one reported within the PDU SESSION ESTABLISHMENT or if there hasn't been one reported or is no longer available it should be set to "initial request". PDU SESSION MODIFICATION REJECT: "modification request”. PDU SESSION RELEASE REJECT: no request type shall be set. PDU SESSION MODIFICATION COMMAND REJECT: "modification request”. | C |
| accessType | AccessType | 0..1 | Access type associated with the session (i.e. 3GPP or non-3GPP access) if provided by the AMF (see TS 24.501 [13] clause 9.11.2.1A). | C |
| rATType | RATType | 0..1 | RAT Type associated with the access if provided by the AMF as part of session establishment (see TS 23.502 [4] clause 4.3.2). Values given as per TS 29.571 [17] clause 5.4.3.2. | C |
| sMPDUDNRequest | SMPDUDNRequest | 0..1 | Contents of the SM PDU DN Request container, if available, as described in TS 24.501 [13] clause 9.11.4.15. | C |
| location | Location | 0..1 | Location information provided by the AMF or present in the context at the SMF, if available. | C |
| NOTE: At least one identity shall be provided, the others shall be provided if available. | | | | |

6.2.3.2.7 MA PDU sessions

6.2.3.2.7.1 General

In the present document, an MA PDU session will include two general types of PDU sessions as defined below:

- MA-Confirmed: This is an MA PDU session where the UE signals Upgrade Allowed to MA and the network immediately upgrades the session to an MA PDU session or the UE explicitly requests an MA PDU session (using a Request Type of MA PDU).

- MA-Upgrade-Allowed: This is a PDU session where the UE indicated that upgrade to an MA PDU session is allowed, but the network does not immediately confirm the upgrade. The network may at some later point upgrade the session to an MA PDU session.

NOTE: The above terms are not defined or used in other 3GPP Stage 2 or Stage 3 specifications, but have been introduced here to clarify and distinguish LI event reporting for the respective situations.

An MA-Confirmed MA PDU session may be established over a single access or over multiple accesses. The establishment over multiple accesses may occur concurrently or may occur at different points in time.

An MA-Upgrade-Allowed MA PDU session is established over a single access and nearly all aspects appears to be an ordinary non-MA PDU session with the key difference that the network may upgrade the session to an MA-confirmed MA PDU session.

6.2.3.2.7.2 MA PDU session establishment

The IRI-POI in the SMF (or for a roaming scenario, V-SMF in the VPLMN for HR or SMF in the VPLMN for LBO) shall generate an xIRI containing an SMFMAPDUSessionEstablishment record when the IRI-POI present in the SMF detects that a PDU session has been established for the target UE that is an MA PDU session (Request Type set to MA PDU session or upgraded at establishment), or where the upgrade allowed parameter is set to upgrade allowed and session is established as an ordinary PDU session (not upgraded at establishment, but may occur later on). The IRI-POI present in the SMF shall generate the xIRI for the following events:

- The SMF creates a new multi-access PDU Session context or SM Context for the target UE (see TS 29.502 [16] clause 5.2.2.2 and clause 5.2.2.7).If the Npcf\_SMPolicyControl\_Create response received from the PCF for the target UE in response to Npcf\_SMPolicyControl\_Create request includes PCC rules in which the traffic control policy data contains either a routeToLocs IE or trafficSteeringPolIdDl IE and/or trafficSteeringPolIdUl IE, then the SMF shall include those PCC rules in the xIRI. These PCC rules correspond to policies that influence the target UE’s traffic flows (see TS 29.513 [88] clause 5.5.3).

**Table 6.2.3-5A: Payload for SMFMAPDUSessionEstablishment record**

| **Field name** | **Type** | **Cardinality** | **Description** | **M/C/O** |
| --- | --- | --- | --- | --- |
| sUPI | SUPI | 0..1 | SUPI associated with the PDU session (e.g. as provided by the AMF in the associated Nsmf\_PDU\_Session\_CreateSMContext service operation). Shall be present except for PEI-only unauthenticated emergency sessions (see NOTE). | C |
| sUPIUnauthenticated | SUPIUnauthenticatedIndication | 0..1 | Shall be present if a SUPI is present in the message and set to “true” if the SUPI has not been authenticated, or “false” if it has been authenticated. | C |
| pEI | PEI | 0..1 | PEI associated with the PDU session, if available (see NOTE). | C |
| gPSI | GPSI | 0..1 | GPSI associated with the PDU session, if available (see NOTE). | C |
| pDUSessionID | PDUSessionID | 1 | PDU Session ID See clause 9.4 of TS 24.501 [13]. Identifies a new PDU session. | M |
| pDUSessionType | PDUSessionType | 1 | Identifies selected PDU session type, see TS 24.501 [13] clause 9.11.4.11. | M |
| accessInfo | SEQUENCE OF AccessInfo | 1..MAX | Identifies the access(es) associated with the PDU session including the information for each specific access (see table 6.2.3-5B). | M |
| sNSSAI | SNSSAI | 0..1 | Slice identifiers associated with the PDU session, if available. See TS 23.003 [19] clause 28.4.2 and TS 23.501 [2] clause 5.15.2. | C |
| uEEndpoint | SEQUENCE OF UEEndpointAddress | 0..MAX | UE endpoint address(es) assigned to the PDU Session if available (see TS 29.244 [15] clause 5.21). | C |
| location | Location | 0..1 | Location information provided by the AMF or present in the context at the SMF, if available. | C |
| dNN | DNN | 1 | Data Network Name requested by the target UE, as defined in TS 23.003 [19] clause 9A and described in TS 23.502 [4] clause 4.3.2.2. Shall be given in dotted-label presentation format as described in TS 23.003 [19] clause 9.1. | M |
| aMFID | AMFID | 0..1 | Identifier of the AMF associated with the target UE, as defined in TS 23.003 [19] clause 2.10.1 if available. | C |
| hSMFURI | HSMFURI | 0..1 | URI of the Nsmf\_PDUSession service of the selected H-SMF, if available. See TS 29.502 [16] clause 6.1.6.2.2. | C |
| requestType | FiveGSMRequestType | 1 | Type of request as described in TS 24.501 [13] clause 9.11.3.47 provided within the Nsmf\_PDU\_Session\_CreateSMContext Request (TS 29.502 [16]) message shall be reported.  In the case where the network does not provide a request type value for a MA PDU session and the network does support MA PDU sessions, the request type shall be set to “MA PDU request” according to TS 24.501 [13] clause 6.4.1.2. | M |
| sMPDUDNRequest | SMPDUDNRequest | 0..1 | Contents of the SM PDU DN Request container, if available, as described in TS 24.501 [13] clause 9.11.4.15. | C |
| servingNetwork | SMFServingNetwork | 1 | PLMN ID of the serving core network operator, and, for a Non-Public Network (NPN), the NID that together with the PLMN ID identifies the NPN. | M |
| oldPDUSessionID | PDUSessionID | 0..1 | The old PDU Session ID received from the UE. See TS 23.502 [4] clauses 4.3.2.2.1 and 4.3.5.2 and TS 24.501 [13] clause 6.4.1.2. Shall be present if this IE is in the SMContextCreateData or PDUSessionCreateData message sent to the SMF or the PDU Session Context or SM Context at the SMF (see TS 29.502 [16] clauses 6.1.6.2.2, 6.1.6.2.9 and 6.1.6.2.39). | C |
| mAUpgradeIndication | SMFMAUpgradeIndication | 0..1 | Indicates whether the PDU session is allowed to be upgraded to MA-Confirmed MA PDU session (see TS 23.502 [4] clause 4.22.3). Include if known. | C |
| ePSPDNCnxInfo | SMFEPSPDNCnxInfo | 0..1 | Indicates if the PDU session may be moved to EPS during its lifetime (see TS 29.502 [16] clause 6.1.6.2.31). Include if known. | C |
| mAAcceptedIndication | SMFMAAcceptedIndication | 1 | Indicates that a request to establish an MA PDU session was accepted or if a single access PDU session request was upgraded into a MA PDU session (see TS 23.502 [4] clauses 4.22.2 and 4.22.3).  It shall be set as follows:  - true: MA-Confirmed MA PDU session was established  - false: single access MA-Upgrade-Allowed MA PDU session was established that may be upgraded to an MA-Confirmed MA PDU session. | M |
| aTSSSContainer | ATSSSContainer | 0..1 | Identifies the steering, switching, and splitting features for the MA-Confirmed MA PDU session. Also indicates whether MPTCP or ATSSS-LL is to be used for ATSSS. See TS 24.501[13] clause 9.11.4.22. | C |
| uEEPSPDNConnection | UEEPSPDNConnection | 0..1 | This IE shall be present, if available, during an EPS to 5GS Idle mode mobility or handover using the N26 interface. If present, it shall contain the EPS bearer context(s) information present in the uEEPSPDNConnection parameter of the intercepted SmContextCreateData message. (see TS 29.502 [16] clause 6.1.6.2.2). | C |
| ePS5GSComboInfo | EPS5GSComboInfo | 0..1 | Provides detailed information about PDN Connections and PDU Sessions during EPS to 5GS idle mode mobility or handover using the N26 interface. Shall be included if the AMF has selected a SMF+PGW-C to serve the PDU session. This parameter shall include the additional IEs in table 6.2.3-1A, if present. | C |
| selectedDNN | DNN | 0..1 | Shall be present if a DNN other than the UE requested DNN is selected for the PDU Session. Shall be given in dotted-label presentation format as described in TS 23.003 [19] clause 9.1. | C |
| handoverState | HandoverState | 0..1 | Indicates whether the PDU Session Establishment being reported was due to a handover. Shall be present if this IE is in the SMContextCreatedData sent by the SMF (see TS 29.502 [16] clause 6.1.6.2.3). | C |
| pCCRules | PCCRuleSet | 0..1 | Set of PCC rules related to traffic influence. Each PCC rule influences the routing of a given traffic flow. If several flows are concerned, then several PCC rules shall be handled by the SMF. Traffic influence policies are originated by an AF. PCF translates these rules into PCC rules for traffic influence. The payload of a PCC rule for traffic influence is defined in table 6.2.3-1E. | C |
| deprecatedEPSPDNConnectionEstablishment | EPSPDNConnectionEstablishment | 0..1 | No longer used in the present version of this specification. | C |
| NOTE: At least one of the SUPI, PEI or GPSI fields shall be present. | | | | |

**Table 6.2.3-5B: Contents of Access Info parameter**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Cardinality** | **Description** | **M/C/O** |
| accessType | AccessType | 1 | Access type associated with the session (i.e. 3GPP or non-3GPP access) as provided by the AMF (see TS 24.501 [13] clause 9.11.2.1A). | M |
| rATType | RATType | 0..1 | RAT Type associated with the access as provided by the AMF as part of session establishment (see TS 23.502 [4] clause 4.3.2). Values given as per TS 29.571 [17] clause 5.4.3.2. | C |
| gTPTunnelID | FTEID | 1 | Contains the F-TEID identifying the GTP tunnel used to encapsulate the traffic, as defined in TS 29.244 [15] clause 8.2.3. Non-GTP encapsulation is for further study. | M |
| 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 |
| establishmentStatus | EstablishmentStatus | 1 | Indicates whether the access type is established or released. | M |
| aNTypeToReactivate | AccessType | 0..1 | Indicates the Access Network Type for which the UP connection is requested to be re-activated, for an MA PDU session. Applicable to session modification reporting. | C |
| gTPTunnelInfo | GTPTunnelInfo | 1 | Contains the information for the User Plane GTP Tunnels for the PDU Session (see TS 29.502 [16] clauses 6.1.6.2.2, 6.1.6.2.9 and 6.1.6.2.39). See Table 6.2.3-1B. | M |
| satelliteBackhaulCategory | SBIType | 0..1 | Indicates that a satellite backhaul is used towards 5G AN and the corresponding backhaul category, if available. Encoded according to TS 29.571 [17] clause 5.4.3.39. The SBIReference for this parameter shall be populated with 'TS29571\_CommonData.yaml#/components/schemas/SatelliteBackhaulCategory'. | C |
| gEOSatelliteID | GEOSatelliteID | 0..1 | Indicates the satellite ID if satellite backhaul category is GEO, if available. Encoded according to TS 29.571 [17] clause 5.4.2. | C |

6.2.3.2.7.3 MA PDU session modification

The IRI-POI in the SMF shall generate an xIRI containing an SMFMAPDUSessionModification record when the IRI-POI present in the SMF detects that an MA PDU session has been modified for the target UE. The IRI-POI present in the SMF shall generate the xIRI for the following events:

- The SMF modifies an existing MA PDU Session context or SM Context for the target UE (see TS 29.502 [16] clause 5.2.2.3 and clause 5.2.2.8).

- The SMF transfers the 3GPP Access Leg of an existing MA PDU Session to EPS (see TS 23.502 [4] clause 4.22.6).

- The SMF transfers an existing PDN Connection associated to an MA PDU Session to 5GS (see TS 23.502 [4] clause 4.22.6).For a non-roaming scenario, SMF sends a Npcf\_SMPolicyControlUpdateNotify response to the PCF for the target UE in response to an Npcf\_SMPolicyControlUpdateNotify request sent by PCF to SMF including PCC rules which traffic control policy data contains either a routeToLocs IE or trafficSteeringPolIdDl IE and/or trafficSteeringPolIdUl IE. These PCC rules correspond to policies that influence the target UE’s traffic flows (see TS 29.513 [88] clause 5.5.3).

**Table 6.2.3-5C: Payload for SMFMAPDUSessionModification record**

| **Field name** | **Type** | **Cardinality** | **Description** | **M/C/O** |
| --- | --- | --- | --- | --- |
| sUPI | SUPI | 0..1 | SUPI associated with the PDU session (e.g. as provided by the AMF in the associated Nsmf\_PDU\_Session\_CreateSMContext service operation). Shall be present except for PEI-only unauthenticated emergency sessions. | C |
| sUPIUnauthenticated | SUPIUnauthenticatedIndication | 0..1 | Shall be present if a SUPI is present in the message, and set to “true” if the SUPI was not authenticated, or “false” if it has been authenticated. | C |
| pEI | PEI | 0..1 | PEI associated with the PDU session, if available. | C |
| gPSI | GPSI | 0..1 | GPSI associated with the PDU session, if available. | C |
| pDUSessionID | PDUSessionID | 1 | PDU Session ID, see TS 24.501 [13] clause 9.4. | M |
| accessInfo | SEQUENCE OF AccessInfo | 0..MAX | Identifies the access(es) associated with the PDU session including the information for each specific access (see table 6.2.3-5B) being modified. | C |
| sNSSAI | SNSSAI | 0..1 | Slice identifier associated with the PDU session, if available. See TS 23.003 [19] clause 28.4.2 and TS 23.501 [2] clause 5.15.2. | C |
| location | Location | 0..1 | Location information provided by the AMF or present in the context at the SMF, if available. | C |
| requestType | FiveGSMRequestType | 0..1 | For both a UE- as well as a network-requested PDU session, the POI (SMF) shall set the request type parameter to "modification request". | C |
| servingNetwork | SMFServingNetwork | 1 | PLMN ID of the serving core network operator, and, for a Non-Public Network (NPN), the NID that together with the PLMN ID identifies the NPN. | M |
| oldPDUSessionID | PDUSessionID | 0..1 | The old PDU Session ID received from the UE. See TS 23.502 [4] clauses 4.3.2.2.1 and 4.3.5.2 and TS 24.501 [13] clause 6.4.1.2. Shall be present if this IE is in the SMContextCreateData or PDUSessionCreateData message sent to the SMF or the PDU Session Context or SM Context at the SMF (see TS 29.502 [16] clauses 6.1.6.2.2, 6.1.6.2.9 and 6.1.6.2.39). | C |
| mAUpgradeIndication | SMFMAUpgradeIndication | 0..1 | Indicates whether the PDU session is allowed to be upgraded to MA PDU session (see TS 23.502 [4] clause 4.22.3). Include if known. | C |
| ePSPDNCnxInfo | SMFEPSPDNCnxInfo | 0..1 | Indicates if the PDU session may be moved to EPS during its lifetime (see TS 29.502 [16] clause 6.1.6.2.31). Include if known. | C |
| mAAcceptedIndication | SMFMAAcceptedIndication | 1 | Indicates that a request to establish an MA PDU session was accepted or if a single access PDU session request was upgraded into a MA PDU session (see clauses 4.22.2 and 4.22.3 of TS 23.502 [4]).  It shall be set as follows:  - true: MA-Confirmed MA PDU session was established  - false: single access MA-Upgrade-Allowed MA PDU session was established that may be upgraded to an MA-Confirmed MA PDU session. | M |
| aTSSSContainer | ATSSSContainer | 0..1 | Identifies the steering, switching, and splitting features for the MA-Confirmed MA PDU session. Also indicates whether MPTCP or ATSSS-LL is to be used for ATSSS. See clause 9.11.4.22 of TS 24.501 [13]. | C |
| uEEPSPDNConnection | UEEPSPDNConnection | 0..1 | This IE shall be present, if available, during an EPS to 5GS Idle mode mobility or handover using the N26 interface. If present, it shall contain the EPS bearer context(s) information present in the uEEPSPDNConnection parameter of the intercepted SmContextCreateData message (see TS 29.502 [16] clause 6.1.6.2.2). | C |
| ePS5GSComboInfo | EPS5GSComboInfo | 0..1 | Provides detailed information about PDN Connections and PDU Sessions during EPS to 5GS idle mode mobility or handover using the N26 interface. Shall be included if the AMF has selected a SMF+PGW-C to serve the PDU session. This parameter shall include the additional IEs in table 6.2.3-1A, if present. | C |
| handoverState | HandoverState | 0..1 | Indicates whether the PDU Session Establishment being reported was due to a handover. Shall be present if this IE is in the SMContextCreatedData sent by the SMF (see TS 29.502 [16] clause 6.1.6.2.3). | C |
| pCCRules | PCCRuleSet | 0..1 | Set of PCC rules related to traffic influence. Each PCC rule influences the routing of a given traffic flow. If several flows are concerned, then several PCC rules shall be handled by the SMF. Traffic influence policies are originated by an AF. PCF translates these rules into PCC rules for traffic influence. The payload of a PCC rule for traffic influence is defined in table 6.2.3-1E. | C |
| uPPathChange | UPPathChange | 0..1 | Notification of the UPPathChange event, if available. This IE is defined in TS 29.508 [90] table 5.6.2.5-1. | C |
| pFDDataForApp | PFDDataForApp | 0..1 | Represents the packet flow descriptions (PFDs) for an application identifier (AppId), if available. This IE is defined in TS 29.551 [96] table 5.6.2.2-1. | C |
| deprecatedEPSPDNConnectionModification | EPSPDNConnectionModification | 0..1 | No longer used in the present version of this specification. | C |

6.2.3.2.7.4 MA PDU session release

The IRI-POI in the SMF shall generate an xIRI containing an SMFMAPDUSessionRelease record when the IRI-POI present in the SMF detects that an MA PDU session has been released. The IRI-POI present in the SMF shall generate the xIRI for the following events:

- The SMF releases an existing MA PDU Session context or SM Context for the target UE (see TS 29.502 [16] clause 5.2.2.4 and clause 5.2.2.9).

**Table 6.2.3-5D: Payload for SMFMAPDUSessionRelease record**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Cardinality** | **Description** | **M/C/O** |
| sUPI | SUPI | 1 | SUPI associated with the PDU session. | M |
| pEI | PEI | 0..1 | PEI associated with the PDU session if available. | C |
| gPSI | GPSI | 0..1 | GPSI associated with the PDU session if available. | C |
| pDUSessionID | PDUSession | 1 | PDU Session ID as assigned by the AMF. | M |
| timeOfFirstPacket | Timestamp | 0..1 | Time of first packet for the PDU session. | C |
| timeOfLastPacket | Timestamp | 0..1 | Time of last packet for the PDU session. | C |
| uplinkVolume | INTEGER | 0..1 | Number of uplink octets for the PDU session. | C |
| downlinkVolume | INTEGER | 0..1 | Number of downlink octets for the PDU session. | C |
| location | Location | 0..1 | Location information, if available. | C |
| cause | SMFErrorCodes | 0..1 | Indicates the NF Service Consumer cause for the requested PDU session release (see TS 29.502 [16] clause 6.1.6.3.8 for enumerated cause information). Include if known. | C |
| nGAPCause | NGAPCauseInt | 0..1 | Indicates the NGAP cause for the requested SM context release (see TS 29.502 [16] clause 6.1.6.2.6). Shall be derived as described in TS 29.571 [17] clause 5.4.4.12. | C |
| fiveGMMCause | FiveGMMCause | 0..1 | Indicates the 5GMM cause for a PDU Session released due to any 5GMM failure (see 29.502 [16] clause 6.1.6.2.6). Shall be sent as an integer derived as described in TS 29.571 [17] clause 5.4.2. | C |
| pCCRulesIDs | PCCRuleIDSet | 0..1 | PCC rule IDs of the PCC rules related to traffic influence that are associated to the PDU session and active at the time the PDU session is released. | C |
| deprecatedEPSPDNConnectionRelease | EPSPDNConnectionRelease | 0..1 | No longer used in the present version of this specification. | C |

6.2.3.2.7.5 Start of interception with an established MA PDU session

The IRI-POI in the SMF shall generate an xIRI containing an SMFStartOfInterceptionWithEstablishedMAPDUSession record when the IRI-POI present in the SMF detects that a MA PDU session has already been established for the target UE when interception starts.The IRI-POI present in the SMF shall generate the xIRI for the following events:

- The SMF has an existing MA PDU Session context or SM Context for the target UE (see TS 29.502 [16] clause 5.2.2.2 and clause 5.2.2.7).

The IRI-POI in the SMF shall generate the xIRI containing the SMFStartOfInterceptionWithEstablishedMAPDUSession record for each of the MA PDU sessions (that meets the above criteria) associated with the newly identified target UEs.

The IRI-POI present in the SMF generating an xIRI containing a SMFStartOfInterceptionWithEstablishedMAPDUSession 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).

**Table 6.2.3-5E: Payload for SMFStartOfInterceptionWithEstablishedMAPDUSession record**

| **Field name** | **Type** | **Cardinality** | **Description** | **M/C/O** |
| --- | --- | --- | --- | --- |
| sUPI | SUPI | 0..1 | SUPI associated with the PDU session (e.g. as provided by the AMF in the associated Nsmf\_PDU\_Session\_CreateSMContext service operation). Shall be present except for PEI-only unauthenticated emergency sessions. | C |
| sUPIUnauthenticated | SUPIUnauthenticatedIndication | 0..1 | Shall be present if a SUPI is present in the message and set to “true” if the SUPI has not been authenticated, or “false” if it has been authenticated. | C |
| pEI | PEI | 0..1 | PEI associated with the PDU session, if available. | C |
| gPSI | GPSI | 0..1 | GPSI associated with the PDU session, if available. | C |
| pDUSessionID | PDUSessionID | 1 | PDU Session ID as assigned by the AMF, as defined in TS 24.007 [14] clause 11.2.3.1b. | M |
| pDUSessionType | PDUSessionType | 1 | Identifies selected PDU session type, see TS 24.501 [13] clause 9.11.4.11. | M |
| accessInfo | SEQUENCE OF AccessInfo | 1..MAX | Identifies the access(es) associated with the PDU session including the information for each specific access (see table 6.2.3-5B). | M |
| sNSSAI | SNSSAI | 0..1 | Slice identifier associated with the PDU session, if available. See TS 23.003 [19] clause 28.4.2 and TS 23.501 [2] clause 5.15.2. | C |
| uEEndpoint | SEQUENCE OF UEEndpointAddress | 0..MAX | UE endpoint address(es) 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). MAC addresses are given as 6 octets with the most significant octet first (see TS 29.244 [15] clause 5.21). | C |
| location | Location | 0..1 | Location information provided by the AMF at session establishment or present in the context at the SMF, if available. | C |
| dNN | DNN | 1 | Data Network Name associated with the target traffic, as defined in TS 23.003 [19] clause 9A and described in TS 23.502 [4] clause 4.3.2.2. Shall be given in dotted-label presentation format as described in TS 23.003 [19] clause 9.1. | M |
| aMFID | AMFID | 0..1 | Identifier of the AMF associated with the target UE, as defined in TS 23.003 [19] clause 2.10.1, if available. | C |
| hSMFURI | HSMFURI | 0..1 | URI of the Nsmf\_PDUSession service of the selected H-SMF, if available. See TS 29.502 [16] clause 6.1.6.2.2. | C |
| requestType | FiveGSMRequestType | 0..1 | Type of request as initially set within PDU SESSION ESTABLISHMENT as described in TS 24.501 [13] clause 9.11.3.47.  If the initial value is no longer available the request type shall be set to “existing PDU session”. | C |
| sMPDUDNRequest | SMPDUDNRequest | 0..1 | Contents of the SM PDU DN request container, if available, as described in TS 24.501 [13] clause 9.11.4.15. | C |
| servingNetwork | SMFServingNetwork | 1 | PLMN ID of the serving core network operator, and, for a Non-Public Network (NPN), the NID that together with the PLMN ID identifies the NPN. | M |
| oldPDUSessionID | PDUSessionID | 0..1 | The old PDU Session ID received from the UE. See TS 23.502 [4] clauses 4.3.2.2.1 and 4.3.5.2 and TS 24.501 [13] clause 6.4.1.2. Include if known. | C |
| mAUpgradeIndication | SMFMAUpgradeIndication | 0..1 | Indicates whether the PDU session is allowed to be upgraded to MA PDU session (see TS 23.502 [4] clause 4.22.3). Include if known. | C |
| ePSPDNCnxInfo | SMFEPSPDNCnxInfo | 0..1 | Indicates if the PDU session may be moved to EPS during its lifetime (see TS 29.502 [16] clause 6.1.6.2.31). Include if known. | C |
| mAAcceptedIndication | SMFMAAcceptedIndication | 1 | Indicates that a request to establish an MA PDU session was accepted or if a single access PDU session request was upgraded into an MA PDU session (see TS 23.502 [4] clauses 4.22.2 and 4.22.3).  It shall be set as follows:  - true: MA-Confirmed MA PDU session was established.  - false: single access MA-Upgrade-Allowed MA PDU session was established that may be upgraded to an MA-Confirmed MA PDU session. | M |
| aTSSSContainer | ATSSSContainer | 0..1 | Identifies the steering, switching, and splitting features for the MA-Confirmed MA PDU session. Also indicates whether MPTCP or ATSSS-LL is to be used for ATSSS. See TS 24.501 [13] clause 9.11.4.22. | C |
| ePS5GSComboInfo | EPS5GSComboInfo | 0..1 | Provides detailed information about PDN Connections and PDU Sessions during EPS to 5GS idle mode mobility or handover using the N26 interface. Shall be included when the AMF has selected a SMF+PGW-C to serve the PDU session. This parameter may include the additional IEs in table 6.2.3-1A, if available. | C |
| uEEPSPDNConnection | UEEPSPDNConnection | 0..1 | This IE shall be present, if available, during an EPS to 5GS Idle mode mobility or handover using the N26 interface. If present, it shall contain the EPS bearer context(s) information present in the uEEPSPDNConnection parameter of the intercepted SmContextCreateData message. (see TS 29.502 [16] clause 6.1.6.2.2). | C |
| pCCRules | PCCRuleSet | 0..1 | Set of PCC rules related to traffic influence. Each PCC rule influences the routing of a given traffic flow. If several flows are concerned, then several PCC rules shall be handled by the SMF. Traffic influence policies are originated by an AF. PCF translates these rules into PCC rules for traffic influence. The payload of a PCC rule for traffic influence is defined in table 6.2.3-1E. | C |
| pFDDataForApps | PFDDataForApps | 0..1 | Represents a set of associations between application identifier and packet flow descriptions (PFDs), if available. | C |
| deprecatedEPSStartOfInterceptionWithEstablishedPDNConnection | EPSStartOfInterceptionWithEstablishedPDNConnection | 0..1 | No longer used in the present version of this specification. | C |

6.2.3.2.7.6 SMF MA unsuccessful procedure

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

Accordingly, the IRI-POI in the SMF generates the xIRI when one of the following events are detected:

- SMF sends a PDU SESSION ESTABLISHMENT REJECT message to the target UE for MA-Confirmed and MA-Upgrade-Allowed MA PDU sessions.

- SMF sends a PDU SESSION MODIFICATION REJECT message to the target UE for MA-Confirmed and MA-Upgrade-Allowed MA PDU sessions.

- SMF sends a PDU SESSION RELEASE REJECT message to the target UE for MA-Confirmed and MA-Upgrade-Allowed MA PDU sessions.

- SMF receives a PDU SESSION MODIFICATION COMMAND REJECT message from the target UE for MA-Confirmed and MA-Upgrade-Allowed MA PDU sessions.

- An ongoing SM procedure is aborted at the SMF, due to e.g. a 5GSM STATUS message sent from or received by the SMF for MA-Confirmed and MA-Upgrade-Allowed MA PDU sessions.

**Table 6.2.3-5F: Payload for SMFMAUnsuccessfulProcedure record**

| **Field name** | **Type** | **Cardinality** | **Description** | **M/C/O** |
| --- | --- | --- | --- | --- |
| failedProcedureType | SMFFailedProcedureType | 1 | Specifies the procedure which failed or is aborted at the SMF. | M |
| failureCause | FiveGSMCause | 1 | Provides the value of the 5GSM cause, see TS 24.501 [13] clause 9.11.4.2. In case the procedure is aborted due to a 5GSM STATUS message, the 5GSM cause is the one included in the 5GSM status message. | 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 |
| initiator | Initiator | 1 | Specifies whether the network (SMF) or the UE is initiating the rejection or indicating the failure. | M |
| sUPI | SUPI | 0..1 | SUPI associated with the procedure, if available (see NOTE). | C |
| sUPIUnauthenticated | SUPIUnauthenticatedIndication | 0..1 | Shall be present if a SUPI is present in the message and set to “true” if the SUPI has not been authenticated, or “false” if it has been authenticated. | 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 |
| pDUSessionID | PDUSessionID | 0..1 | PDU Session ID, see TS 24.501 [13] clause 9.4, if available. | C |
| accessInfo | SEQUENCE OF AccessInfo | 1..MAX | Identifies the access(es) associated with the PDU session including the information for each specific access (see table 6.2.3-5B). | M |
| uEEndpoint | SEQUENCE OF UEEndpointAddress | 0..MAX | UE endpoint address(es) if available. | C |
| location | Location | 0..1 | Location information provided by the AMF or present in the context at the SMF, if available. | C |
| dNN | DNN | 0..1 | Data Network Name associated with the target traffic, as defined in TS 23.003 [19] clause 9A and described in TS 23.501 [2] clause 4.3.2.2, if available. Shall be given in dotted-label presentation format as described in TS 23.003 [19] clause 9.1. | C |
| aMFID | AMFID | 0..1 | Identifier of the AMF associated with the target UE, as defined in TS 23.003 [19] clause 2.10.1 when available. | C |
| hSMFURI | HSMFURI | 0..1 | URI of the Nsmf\_PDUSession service of the selected H-SMF, if available. See TS 29.502 [16] clause 6.1.6.2.2. | C |
| requestType | FiveGSMRequestType | 0..1 | Type of request as described in TS 24.501 [13] clause 9.11.3.47, if available.  Otherwise depending on the REJECT event the following request type shall be reported:  PDU SESSION ESTABLISHMENT REJECT: The request type shall be set to the one reported within the PDU SESSION ESTABLISHMENT or if there hasn't been one reported it should be set to "MA PDU request".  PDU SESSION MODIFICATION REJECT: "modification request”.  PDU SESSION RELEASE REJECT: no request type shall be set.  PDU SESSION MODIFICATION COMMAND REJECT: "modification request”. | C |
| sMPDUDNRequest | SMPDUDNRequest | 0..1 | Contents of the SM PDU DN Request container, if available, as described in TS 24.501 [13] clause 9.11.4.15. | C |
| NOTE: At least one identity shall be provided, the others shall be provided if available. | | | | |

6.2.3.2.8 PDU to MA PDU session modification

The IRI-POI in the SMF shall generate an xIRI containing an SMFPDUtoMAPDUSessionModification record when the IRI-POI present in the SMF detects that an existing PDU session for the target UE has been successfully modified to an MA PDU session using the PDU session modification procedures as described in TS 24.501 [13]. A PDU session is considered to be successfully modified to a MA PDU session, when all of the following are true:

1. The UE is registered to both 3GPP access and non-3GPP access:

- In the same PLMN (non-roaming UE).

- In the different PLMNs (roaming UE).

2. SMF receives the PDU SESSION MODIFICATION REQUEST from the UE (TS 24.501 [13] clause 8.2.10) that includes one of the following:

- *modification request* and includes MA PDU session information IE set to *MA PDU session network upgrade allowed*.

- *MA PDU request*.

3. SMF sends a PDU SESSION MODIFICATION COMMAND to the UE that includes the ATSSS IE (TS 24.501 [13] clause 6.4.2.3).

4. SMF receives the PDU SESSION MODIFICATION COMPLETE from the UE (TS 24.501 [13] clause 8.3.10.1).

5. The 5GSM state within the SMF is PDU Session Active.

Once the SMFPDUtoMAPDUSessionModification record has been generated by the IRI-POI in the SMF, the IRI-POI shall follow clause 6.2.3.2.7 of the present document for further reporting for this MA PDU session.

**Table 6.2.3-5G: Payload for SMFPDUtoMAPDUSessionModification record**

| **Field name** | **Type** | **Cardinality** | **Description** | **M/C/O** |
| --- | --- | --- | --- | --- |
| sUPI | SUPI | 0..1 | SUPI associated with the PDU session (e.g. as provided by the AMF in the associated Nsmf\_PDU\_Session\_CreateSMContext service operation). Shall be present except for PEI-only unauthenticated emergency sessions. | C |
| sUPIUnauthenticated | SUPIUnauthenticatedIndication | 0..1 | Shall be present if a SUPI is present in the message and set to *true* if the SUPI was not authenticated, or *false* if it has been authenticated. | C |
| pEI | PEI | 0..1 | PEI associated with the PDU session if available. | C |
| gPSI | GPSI | 0..1 | GPSI associated with the PDU session if available. | C |
| sNSSAI | SNSSAI | 0..1 | Slice identifier associated with the PDU session, if available. See TS 23.003 [19] clause 28.4.2 and TS 23.501 [2] clause 5.15.2. | 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 |
| location | Location | 0..1 | Location information provided by the AMF or present in the context at the SMF, if available. | C |
| requestType | FiveGSMRequestType | 1 | In accordance with the request type as described in TS 24.501 [13] clause 6.4.2.2 and clause 9.11.3.47 a request type of “modification request” shall be reported. | M |
| accessType | AccessType | 0..1 | Access type associated with the session (i.e. 3GPP or non-3GPP access) if provided by the AMF (see TS 24.501 [13] clause 9.11.2.1A). | C |
| rATType | RATType | 0..1 | RAT type associated with the access, if available. Values given as per TS 29.571 [17] clause 5.4.3.2. | C |
| pDUSessionID | PDUSessionID | 1 | PDU Session ID, see TS 24.501 [13] clause 9.4. | M |
| requestIndication | RequestIndication | 1 | Indicates the request type for PDU session modification as indicated by the requestIndication sent in the PDU SESSION MODIFICATION REQUEST (see TS 29.502 [16] clause 6.1.6.3.6). | M |
| aTSSSContainer | ATSSSContainer | 1 | Identifies the steering, switching, and splitting features for the MA-Confirmed MA PDU session. Also indicates whether MPTCP or ATSSS-LL is to be used for ATSSS. See TS 24.501 [13] clause 9.11.4.22. | M |
| uEEndpoint | UEEndpointAddress | 0..1 | UE IP address(es) assigned to the PDU Session if available (See TS 29.244 [15] clause 5.21). | C |
| servingNetwork | SMFServingNetwork | 0..1 | Shall be present if this IE is in the SMContextUpdateData, HsmfUpdateData or message sent to the SMF or the PDU Session Context or SM Context at the SMF (see TS 29.502 [16] clauses 6.1.6.2.3, 6.1.6.2.11 and 6.1.6.2.39). | C |
| handoverState | HandoverState | 0..1 | Indicates whether the PDU Session Modification being reported was due to a handover. Shall be present if this IE is in the SMContextUpdatedData or sent by the SMF (see TS 29.502 [16] clause 6.1.6.2.3). | C |
| gTPTunnelInfo | GTPTunnelInfo | 1 | Contains the information for the User Plane GTP Tunnels for the PDU Session (see TS 29.502 [16] clauses 6.1.6.2.2, 6.1.6.2.9 and 6.1.6.2.39). See table 6.2.3-1B. | M |
| deprecatedEPSPDNConnectionModification | EPSPDNConnectionModification | 0..1 | No longer used in the present version of this specification. | C |

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

6.2.3.7 Generation of IRI over LI\_HI2

When an xIRI is received over LI\_X2 from the IRI-POI in the SMF or the IRI-POI in the UPF, the MDF2 shall send the IRI message over LI\_HI2 without undue delay. The IRI message shall contain a copy of the relevant record received from LI\_X2. The record may be enriched by other information available at the MDF (e.g. additional location information).

The ETSI TS 102 232-1 [9] *@LI-PS-PDU.pSHeader.timeStamp* field shall be set to the time at which the SMF event was observed (i.e. the timestamp field of the xIRI).

The *@LI-PS-PDU.payload.iRIPayloadSequence.iRIType* parameter (see ETSI TS 102 232-1 [9] clause 5.2.10) shall be included and coded according to table 6.2.3-14.

**Table 6.2.3-14: IRI type for IRI messages**

|  |  |
| --- | --- |
| **Record type** | **IRI Type** |
| SMFPDUSessionEstablishment | BEGIN |
| SMFPDUSessionRelease | END |
| SMFPDUSessionModification | CONTINUE |
| SMFStartOfInterceptionWithEstablishedPDUSession | BEGIN |
| SMFUnsuccessfulProcedure | REPORT |
| SMFMAPDUSessionEstablishment | BEGIN |
| SMFMAPDUSessionRelease | END |
| SMFMAPDUSessionModification | CONTINUE |
| SMFStartOfInterceptionWithEstablishedMAPDUSession | BEGIN |
| SMFMAUnsuccessfulProcedure | REPORT |
| SMFPDUtoMAPDUSessionModification | CONTINUE |
| PDHeaderReport | REPORT |
| PDSummaryReport | REPORT |

IRI messages associated with the same PDU Session shall be assigned the same CIN (see ETSI TS 102 232-1 [9] clause 5.2.4).

In the case of EPS/5GS interworking, all IRI messages associated with the same PDU Session (see TS 29.502 [16] clause 6.1.6.2.31), including EPS PDN connection messages for associted PDN Connections shall be assigned the same CIN (see ETSI TS 102 232-1 [9] clause 5.2.4).

The *@LI-PS-PDU.payload.iRIPayloadSequence.iRIContents.threeGPP33128DefinedIRI* field (see ETSI TS 102 232-7 [10] clause 15) of the LI\_HI2 message shall be populated with the BER-encoded *IRIPayload*.

When an additional warrant is activated on a target UE and the LIPF uses the same XID for the additional warrant, the MDF2 shall be able to generate and deliver the IRI message containing the SMFStartOfInterceptionWithEstablishedPDUSession record and the SMFStartOfInterceptionWithEstablishedMAPDUSession record to the LEMF associated with the additional warrant without receiving a corresponding xIRI. The payload of the SMFStartOfInterceptionWithEstablishedPDUSession record is specified in table 6.2.3-4, while the payload of the SMFStartOfInterceptionWithEstablishedMAPDUSession record is specified in table 6.2.3-9. The MDF2 shall generate and deliver the IRI message containing the SMFStartOfInterceptionWithEstablishedPDUSession record for each of the established PDU sessions to the LEMF associated with the new warrant. The MDF2 shall generate and deliver the IRI message containing the SMFStartOfInterceptionWithEstablishedMAPDUSession record for each of the established MA PDU sessions to the LEMF associated with the new warrant.

If the MDF2 did not receive a previous *SMFStartOfInterceptionWithEstablishedPDUSession.timeOfSessionEstablishment* or *SMFStartOfInterceptionWithEstablishedMAPDUSession*.*timeOfSessionEstablishment* for the same session from the IRI-POI, , the MDF2 shall set the value of the *SMFStartOfInterceptionWithEstablishedPDUSession.timeOfSessionEstablishment* or *SMFStartOfInterceptionWithEstablishedMAPDUSession*.*timeOfSessionEstablishment* to the time provided in the timestamp previously received in the header of the related SMFPDUSessionEstablishment or SMFMAPDUSessionEstablishment xIRI.

When the delivery of packet header information is authorised and approach 2 described in clause 6.2.3.9.1 is used, the MDF2 shall generate the IRI message and send it over LI\_HI2 without undue delay when xCC is received over LI\_MDF from the MDF3. The MDF2 shall generate packet header information reporting as described in clause 6.2.3.5.

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

### 6.3.1 General

The present document allows three options for EPC LI stage 3 interfaces for 4G / LTE:

- Option A: Use LI\_X1, LI\_X2 and LI\_X3 interfaces specified below in clauses 6.3.2 and 6.3.3 for the events listed in TS 33.127 [5] clauses 6.3.2.3 and 6.3.3.3, and the events related to SMS over NAS as specified in TS 33.107 [36] clause 18.2.4.

- Option B: Use LI\_X1, LI\_X2 and LI\_X3 interfaces as specified in clause 6.3.2 and 6.3.3 for the events listed in TS 33.107 [36] clause 12.2.1.2 and for the events related to the MMEIdentifierAssociation record described in clause 6.3.2.2.2.

- Option C: Use TS 33.107 [36] clause 12 natively as defined in that document.

For implementations that include EPS/5GS interworking, Option A shall be used.

For implementations that include EPS features introduced after release 15, Option A shall be used.

In all cases, the present document specifies the stage 3 for the LI\_HI1, LI\_HI2 and LI\_HI3 interfaces.

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

#### 6.3.3.0 General

Unless otherwise specified, the following clauses apply to both CUPS and non-CUPS EPS architectures. When CUPS architecture is used, unless otherwise specified, the term SGW/PGW refers to both the SGW-U/PGW-U and the SGW-C/PGW-C.

Unless otherwise specified, the following clauses apply in the case of EPC-5GC interworking via combined SMF+PGW-C and UPF+PGW-U. When EPC-5GC interworking via combined SMF+PGW-C and UPF+PGW-U is used, unless otherwise specified, the term SGW/PGW refers to SMF+PGW-C and SMF+PGW-U and the requirements in clause 6.2.3 shall apply to 5GS PDU connections.

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

#### 6.3.3.2 Generation of xIRI over LI\_X2

##### 6.3.3.2.1 General

When Option A specified in clause 6.3.1 is used:

- For architectures with EPC/5GC interworking:

- The IRI-POI present in the SMF+PGW-C shall send the xIRIs over LI\_X2 for each of the events listed in TS 33.127 [5] clause 6.3.3.3.1.2, as described in clause 6.3.1.

- As described in TS 23.501 [2] clause 5.32.7.1, a PDN Connection in EPS can be one leg of an MA PDU session.

- For architectures with standalone EPC:

- The IRI-POI present in the SGW/PGW and ePDG shall send the xIRIs over LI\_X2 for each of the events listed in TS 33.127 [5] clause 6.3.3.3.1.3, as described in clause 6.3.1.

NOTE: The details of the events triggers used to generate the xIRIs are specified at high-level in support of possible hitherto implementation variations for EPS LI.

When Option B specified in clause 6.3.1 is used:

- The IRI-POI present in the SGW/PGW and ePDG shall send the xIRIs over LI\_X2 for each of the events listed in TS 33.107 [36] clause 12.2.1.2, the details of which are specified in clause 12.2.3 of the same TS.

- The IRI-POI present in the SGW/PGW and ePDG shall set the payload format to EpsHI2Operations.EpsIRIContent (value 14), see clause 5.3 and ETSI TS 103 221-2 [8] clause 5.4. The payload field shall contain an EpsHI2Operations.EpsIRIContent structure encoded according to TS 33.108 [12] clauses 10.5 and B.9.

- As the LIID may not be available at the SGW/PGW and ePDG but is mandatory in EpsHI2Operations.EpsIRIContent according to TS 33.108 [12] Annex B.9, its value in the lawfulInterceptionIdentifier field of the encoded PDU shall be set to the fixed string "LIIDNotPresent".

##### 6.3.3.2.2 PDN Connection Establishment

The IRI-POI in the SGW/PGW shall generate an xIRI containing an ePSPDNConnectionEstablishment record when the IRI-POI present in the SGW/PGW detects that a PDN Connection has been established for the target UE. The IRI-POI present in the SGW/PGW shall generate the xIRI for the following events:

- The SGW/PGW creates a new PDN Connection in the target UE context of the SGW/PGW (see TS 23.401 [50] clauses 5.7.3 and 5.7.4).

Table 6.3.3-1: Payload for EPSPDNConnectionEstablishment type/record

| Field name | Type | Cardinality | Description | M/C/O |
| --- | --- | --- | --- | --- |
| ePSSubscriberIDs | EPSSubscriberIDs | 1 | EPS Subscriber Identities associated with the PDN connection (e.g. as provided by the MME or SGW in the associated Create Session Request or as associated with the PDN connection in the context known at the NF). The IMSI shall be present except for unauthenticated emergency sessions. | M |
| iMSIUnauthenticated | IMSIUnauthenticatedIndication | 0..1 | Shall be present if an IMSI is present in the ePSSubscriberIDs and set to “true” if the IMSI has not been authenticated, or “false” if it has been authenticated. | C |
| defaultBearerID | EPSBearerID | 1 | Shall contain the EPS Bearer Identity of the default bearer associated with the PDN connection. | M |
| gTPTunnelInfo | GTPTunnelInfo | 0..1 | Contains the information for the Control Plane GTP Tunnels present in the Create Session Request or known in the context at the SGW or PGW. See table 6.2.3-1B. | C |
| pDNConnectionType | PDNConnectionType | 1 | Identifies selected PDN session type, see TS 29.274 [87] clause 8.34. | M |
| uEEndpoints | SEQUENCE OF UEEndpointAddress | 0..MAX | UE endpoint address(es) if available. Derived from the PDN Address portion of the PDN Address Allocation parameter (see TS 29.274 [87] clause 8.14) present in the Create Session Request or the IP Address associated to the PDN Connection in the context known at the NF (see TS 23.401 [50] clauses 5.7.3 and 5.7.4). | C |
| non3GPPAccessEndpoint | UEEndpointAddress | 1 | UE's local IP address used to reach the ePDG, if present in the Create Session Request (see TS 29.274 [87] clause 7.2.1) or known at the context at the SGW or PGW. | C |
| location | Location | 0..1 | Location information present in the Create Session Request (see TS 29.274 [87] clause 7.2.1) or known in the context at the SGW or PGW. | C |
| additionalLocation | Location | 0..1 | Additional location information present in the Create Session Request, known in the context at the SGW or PGW, or known at the MDF. | C |
| aPN | APN | 1 | Access Point Name associated with the PDN connection present in the Create Session Request (see TS 29.274 [87] clauses 7.2.1 and 8.6) or known at the context at the SGW or PGW (see TS 23.401 [50] clause 5.7.4), as defined in TS 23.003[19] clause 9.1. | M |
| requestType | EPSPDNConnectionRequestType | 0..1 | Type of request as derived from the Request Type described in TS 24.301 [50] clause 9.9.4.14 and TS 24.008 [95] clause 10.5.6.17, if available. | C |
| accessType | AccessType | 0..1 | Access type associated with the PDN connection (i.e. 3GPP or non-3GPP access). Shall be set to nonThreeGPPAccess by the ePDG or by the PGW when the Create Session Request for the PDN connection is received from an ePDG. Shall be set to threeGPPAccess by the SGW or by the PGW when the Create Session Request for the PDN connection is received from an SGW. | C |
| rATType | RATType | 0..1 | RAT Type associated with the PDN connection. Shall be present if included in the Create Session Request (see TS 29.274 [87] clause 7.2.1) or known at the context at the SGW or PGW (see TS 23.401 [50] clause 5.7.4). | C |
| protocolConfigurationOptions | PDNProtocolConfigurationOptions | 0..1 | Shall be present if the Create Session Request or the Create Session Response (see TS 29.274 [87] clauses 7.2.2 and 7.2.3) contains the Protocol Configuration, Additional Protocol Configuration Options or extended Protocol Configuration Options IE. See table 6.3.3-4. | C |
| servingNetwork | SMFServingNetwork | 0..1 | Shall be present if this IE is in the Create Session Request or the context for the PDN connection at the SGW/PGW. | C |
| sMPDUDNRequest | SMPDUDNRequest | 0..1 | Contents of the SM PDU DN Request container, if available, as described in TS 24.501 [13] clause 9.11.4.15. | C |
| bearerContextsCreated | SEQUENCE OF EPSBearerContextCreated | 1..MAX | Shall include a list of the Bearer Contexts created sent in the Create Session Response message (see TS 29.274 [87] clause 7.2.2). See table 6.3.3-2. | M |
| bearerContextsMarkedForRemoval | SEQUENCE OF EPSBearerContextForRemoval | 0..MAX | Shall include a list of the Bearer Contexts to be removed sent in the Create Session Response message (see TS 29.274 [87] clause 7.2.2). See table 6.3.3-3. | C |
| indicationFlags | PDNConnectionIndicationFlags | 0..1 | Shall be included if the Indication Flags field is present in the Create Session Request (see TS 29.274 [87] clause 7.2.1). The value of this parameter shall be set to the value of the Indication IE (see TS 29.274 [87] clause 8.12) starting with octet 5. | C |
| handoverIndication | PDNHandoverIndication | 0..1 | Shall be present if the Handover Indication is set to 1 in the Create Session Request (see TS 29.274 [87] clauses 7.2.1 and 8.12). | C |
| nBIFOMSupport | PDNNBIFOMSupport | 0..1 | Shall be present if the NBIFOM Support Indication is set to 1 in the Create Session Request (see TS 29.274 [87] clauses 7.2.1 and 8.12). | C |
| fiveGSInterworkingInfo | FiveGSInterworkingInfo | 0..1 | Shall be present if the 5GS Interworking Indication is present in the Create Session Request (see TS 29.274 [87] clauses 7.2.1 and 8.12). See table 6.3.3-5. | C |
| cSRMFI | CSRMFI | 0..1 | Shall be present if the Create Session Request Message Forwarded Indication (CSRMFI) is present in the Create Session Request (see TS 29.274 [87] clauses 7.2.1 and 8.12). Indicates the Create Session Request message has been forwarded by a PGW. | C |
| restorationOfPDNConnectionsSupport | RestorationOfPDNConnectionsSupport | 0..1 | Shall be present if the Restoration of PDN connection after an PGW-C/SMF Change Support Indication is present in the Create Session Request (see TS 29.274 [87] clauses 7.2.1 and 8.12). | C |
| pGWChangeIndication | PGWChangeIndication | 0..1 | Shall be present if the PGW Change Indication is present in the Create Session Request (see TS 29.274 [87] clauses 7.2.1 and 8.12). | C |
| pGWRNSI | PGWRNSI | 0..1 | Shall be present if the PGW Redirection due to mismatch with Network Slice subscribed by the UE Support Indication is present in the Create Session Request (see TS 29.274 [87] clauses 7.2.1 and 8.12). | C |

Table 6.3.3-2: Structure of EPSBearerContextCreated type

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| ePSBearerID | EPSBearerID | 1 | Shall include the EPS bearer ID for the EPS Bearer (See TS 29.274 [87] clauses 7.2.2 and 7.2.4). | M |
| cause | EPSBearerCreationCauseValue | 1 | Shall indicate whether the bearer handling was successful and if not, it gives information on the reason (see TS 29.274 [87] clauses 7.2.2 and 7.2.4). Sent as an integer cause value (see TS 29.274 [87] table 8.4-1) | M |
| gTPTunnelInfo | GTPTunnelInfo | 0..1 | Contains the information for the User Plane GTP Tunnels for the bearer context if present in the Request or Response (see TS 29.274 [87] clauses 7.2.2, 7.2.4 and 8.15) or known at the context at the SGW or PGW (see TS 23.401 [50] clause 5.7.4). See table 6.2.3-1B. | C |
| bearerQOS | EPSBearerQOS | 0..1 | Shall include the QOS information for the bearer, if present in the Request or Response (see TS 29.274 [87] clauses 7.2.2, 7.2.15 and 8.15) or known at the context at the SGW or PGW (see TS 23.401 [50] clause 5.7.4). See table 6.3.3-7. | C |
| protocolConfigurationOptions | PDNProtocolConfigurationOptions | 0..1 | Shall be present if the Bearer Context reported (see TS 29.274 [87] clauses 7.2.2, 7.2.3, and 7.2.4) contains the Protocol Configuration, Additional Protocol Configuration Options or extended Protocol Configuration Options IE. See table 7.6.3.3-4. | C |

Table 6.3.3-3: Structure of EPSBearerContextForRemoval type

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| ePSBearerID | EPSBearerID | 1 | Shall include the EPS bearer ID for the EPS Bearer (See TS 29.274 [87] clauses 7.2.2, 7.2.8 and 7.2.10). | M |
| cause | EPSBearerRemovalCauseValue | 1 | Shall indicate whether the bearer handling was successful and if not, it gives information on the reason (see TS 29.274 [87] clauses 7.2.2, 7.2.8 and 7.2.10). | M |

Table 6.3.3-4: Structure of PDNProtocolConfigurationOptionstype

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| requestPCO | PDNPCO | 0..1 | Shall be present if the Protocol Configuration Options IE is present in the request message. The value of this parameter shall contain a copy of the value field of the PCO IE of the request message (see TS 29.274 [87] clause 8.13 starting with octet 5). | C |
| requestAPCO | PDNPCO | 0..1 | Shall be present if the Additional Protocol Configuration Options IE is present in the request message. The value of this parameter shall contain a copy of the value field of the PCO IE of the request message (see TS 29.274 [87] clause 8.94 starting with octet 5). | C |
| requestEPCO | PDNPCO | 0..1 | Shall be present if the Extended Protocol Configuration Options IE is present in the request message. The value of this parameter shall contain a copy of the value field of the PCO IE of the request message (see TS 29.274 [87] clause 8.128 starting with octet 5). | C |
| responsePCO | PDNPCO | 0..1 | Shall be present if the Protocol Configuration Options IE is present in the response message. The value of this parameter shall contain a copy of the value field of the PCO IE of the response message (see TS 29.274 [87] clause 8.13 starting with octet 5). | C |
| responseAPCO | PDNPCO | 0..1 | Shall be present if the Additional Protocol Configuration Options IE is present in the response message. The value of this parameter shall contain a copy of the value field of the PCO IE of the response message (see TS 29.274 [87] clause 8.94 starting with octet 5). | C |
| responseEPCO | PDNPCO | 0..1 | Shall be present if the Extended Protocol Configuration Options IE is present in the response message. The value of this parameter shall contain a copy of the value field of the PCO IE of the response message (see TS 29.274 [87] clause 8.128 starting with octet 5). | C |

Table 6.3.3-5: Structure of FiveGSInterworkingInfo type

| Field name | Type | Cardinality | Description | M/C/O |
| --- | --- | --- | --- | --- |
| fiveGSInterworkingIndicator | FiveGSInterworkingIndicator | 1 | Shall be set to TRUE if the 5GSIWKI flag in the Indication IE of the request or response is set to 1. Indicates that the UE supports N1 mode and the PDN connection is not restricted from interworking by the 5GS user subscription. See TS 29.274 [87] clauses 7.2.1 and 8.12. | M |
| fiveGSInterworkingWithoutN26 | FiveGSInterworkingWithoutN26 | 1 | Shall be set to TRUE if the 5GS Interworking without N26 Indication flag in the Indication IE of the request or response is set to 1. If the 5GS Interworking without N26 Indication flag in the Indication IE of the request or response is set to 0 or not present, this parameter shall be set to FALSE. See TS 29.274 [87] clauses 7.2.1 and 8.12. | M |
| fiveGCNotRestrictedSupport | FiveGCNotRestrictedSupport | 1 | Shall be set to TRUE if the 5GCNRS (5GC Not Restricted Support) flag in the Indication IE of the request or response is set to 1. If the 5GCNRS flag in the Indication IE of the request or response is set to 0 or not present, this parameter shall be set to FALSE. See TS 29.274 [87] clauses 7.2.1 and 8.12. | M |

Table 6.3.3-6: Structure of EPSGTPTunnels type

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| controlPlaneSenderFTEID | FTEID | 0..1 | Shall include the Sender F-TEID for the control plane if present in the Request or response (see TS 29.274 [87] clauses 7.2.1, 7.2.2, 7.2.3, 7.2.4, 7.2.7, 7.2.8, 7.2.15, 7.2.16) or known in the context at the SGW or PGW. | C |
| controlPlanePGWS5S8FTEID | FTEID | 0..1 | Shall include the PGW F-TEID for the control plane if present in the Request or response (see TS 29.274 [87] clauses 7.2.1, 7.2.2, 7.2.3, 7.2.4, 7.2.7, 7.2.8, 7.2.15, 7.2.16) or known in the context at the SGW or PGW. | C |
| s1UeNodeBFTEID | FTEID | 0..1 | Shall include the F-TEID for the eNodeB S1-U interface for the bearer if present in the Request or response (see TS 29.274 [87] clauses 7.2.1, 7.2.2, 7.2.3, 7.2.4, 7.2.7, 7.2.8, 7.2.15, 7.2.16) or known in the context at the SGW or PGW. | C |
| s5S8SGWFTEID | FTEID | 0..1 | Shall include the F-TEID for the SGW S5 or S8 interface for the bearer if present in the Request or response (see TS 29.274 [87] clauses 7.2.1, 7.2.2, 7.2.3, 7.2.4, 7.2.7, 7.2.8, 7.2.15, 7.2.16) or known in the context at the SGW or PGW. | C |
| s5S8PGWFTEID | FTEID | 0..1 | Shall include the F-TEID for the PGW S5 or S8 interface for the bearer if present in the Request or response (see TS 29.274 [87] clauses 7.2.1, 7.2.2, 7.2.3, 7.2.4, 7.2.7, 7.2.8, 7.2.15, 7.2.16) or known in the context at the SGW or PGW. | C |
| s2bUePDGFTEID | FTEID | 0..1 | Shall include the F-TEID for the ePDG on the S2b-U interface for the bearer if present in the Request or response (see TS 29.274 [87] clauses 7.2.1, 7.2.2, 7.2.3, 7.2.4, 7.2.7, 7.2.8, 7.2.15, 7.2.16) or known in the context at the PGW or ePDG. | C |
| s2aUePDGFTEID | FTEID | 0..1 | Shall include the F-TEID for the ePDG on the S2a-U interface for the bearer if present in the Request or response (see TS 29.274 [87] clauses 7.2.1, 7.2.2, 7.2.3, 7.2.4, 7.2.7, 7.2.8, 7.2.15, 7.2.16) or known in the context at the PGW or ePDG. | C |

Table 6.3.3-7: Structure of EPSBearerQOS Type

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| qCI | QCI | 0..1 | Shall include the QCI for the bearer if present in the Request or response (see TS 29.274 [87] clauses 7.2.1, 7.2.2, 7.2.3 and 7.2.15), or known in the context at the SGW or PGW. | C |
| maximumUplinkBitRate | BitrateBinKBPS | 0..1 | Shall include the maximum uplink bitrate encoded as kilobits per second in binary value (see TS 29.274 [87] clause 8.15) if present in the Request or response (see TS 29.274 [87] clauses 7.2.1, 7.2.2, 7.2.3 and 7.2.15), or known in the context at the SGW or PGW. | C |
| maximumDownlinkBitRate | BitrateBinKBPS | 0..1 | Shall include the maximum downlink bitrate encoded as kilobits per second in binary value (see TS 29.274 [87] clause 8.15) if present in the Request or response (see TS 29.274 [87] clauses 7.2.1, 7.2.2, 7.2.3 and 7.2.15), or known in the context at the SGW or PGW. | C |
| guaranteedUplinkBitRate | BitrateBinKBPS | 0..1 | Shall include the guaranteed uplink bitrate encoded as kilobits per second in binary value (see TS 29.274 [87] clause 8.15) if present in the Request or response (see TS 29.274 [87] clauses 7.2.1, 7.2.2, 7.2.3 and 7.2.15), or known in the context at the SGW or PGW. | C |
| guaranteedDownlinkBitRate | BitrateBinKBPS | 0..1 | Shall include the guaranteed downlink bitrate encoded as kilobits per second in binary value (see TS 29.274 [87] clause 8.15) if present in the Request or response (see TS 29.274 [87] clauses 7.2.1, 7.2.2, 7.2.3 and 7.2.15), or known in the context at the SGW or PGW. | C |
| priorityLevel | EPSQOSPriority | 0..1 | Shall include the priority level assigned to the bearer as an integer value (see TS 29.274 [87] clause 8.15) if present in the Request or response (see TS 29.274 [87] clauses 7.2.1, 7.2.2, 7.2.3 and 7.2.15), or known in the context at the SGW or PGW. | C |

##### 6.3.3.2.3 PDN Connection Modification

The IRI-POI in the SGW/PGW shall generate an xIRI containing an ePSPDNConnectionEstablishment record when the IRI-POI present in the SGW/PGW detects that a PDN Connection has been modified for the target UE. The IRI-POI present in the SGW/PGW shall generate the xIRI for following events:

- The SGW/PGW modifies an existing PDN Connection in the target UE context of the SGW/PGW (see TS 23.401 [50] clauses 5.7.3 and 5.7.4).

In the case of interworked EPS/5GS, the IRI-POI in the SGW/PGW shall also generate an xIRI containing an EPSPDNConnectionModification record e for the following events:

- The SMF+PGW-C transfers an existing PDU Session to EPS (see TS 23.502 [4] clauses 4.11.1.2.1 and 4.11.2.2).

- The SMF+PGW-C transfers an existing PDN Connection to 5GS (see TS 23.502 [4] clauses 4.11.1.2.2 and 4.11.2.3).

Table 6.3.3-8: Payload for EPSPDNConnectionModification type/record

| Field name | Type | Cardinality | Description | M/C/O |
| --- | --- | --- | --- | --- |
| ePSSubscriberIDs | EPSSubscriberIDs | 1 | EPS Subscriber Identities associated with the PDN connection (e.g. as provided by the MME or SGW in the associated network message or as associated with the PDN connection in the context known at the NF). The IMSI shall be present except for unauthenticated emergency sessions. | M |
| iMSIUnauthenticated | IMSIUnauthenticatedIndication | 0..1 | Shall be present if an IMSI is present in the ePSSubscriberIDs and set to “true” if the IMSI has not been authenticated, or “false” if it has been authenticated. | C |
| defaultBearerID | EPSBearerID | 1 | Shall contain the EPS Bearer Identity of the default bearer associated with the PDN connection. | M |
| gTPTunnelInfo | GTPTunnelInfo | 0..1 | Contains the information for the Control Plane GTP Tunnels present in the network message or known in the context at the SGW or PGW. See table 6.2.3-1B. If the gTPTunnelInfo received in the network message is different than the gTPTunnelInfo in the context for the PDN Connection, this message shall be populated with the new information. | C |
| pDNConnectionType | PDNConnectionType | 1 | Identifies selected PDN session type, see TS 29.274 [13] clause 8.34. | M |
| uEEndpoints | SEQUENCE OF UEEndpointAddress | 0..MAX | UE endpoint address(es) if available. Derived from the PDN Address portion of the PDN Address Allocation parameter (see TS 29.274 [87] clause 8.14) present in the network message or the IP Address associated to the PDN Connection in the context known at the NF (see TS 23.401 [50] clauses 5.7.3 and 5.7.4). | C |
| non3GPPAccessEndpoint | UEEndpointAddress | 0..1 | UE's local IP address used to reach the ePDG, if present in the network message (see TS 29.274 [87] clauses 7.2.4, 7.2.7 and 7.2.16) or known at the context at the SGW or PGW. | C |
| location | Location | 0..1 | Location information present in the network message (see TS 29.274 [87] clause 8.21) or known in the context at the SGW or PGW. | C |
| additionalLocation | Location | 0..1 | Additional location information present in the network message, known in the context at the SGW or PGW, or known at the MDF. | C |
| aPN | APN | 1 | Access Point Name associated with the PDN connection present in the network message (see TS 29.274 [87] clause 8.6) or known at the context at the SGW or PGW (see TS 23.401 [50] clause 5.7.4), as defined in TS 23.003[19] clause 9.1. | M |
| requestType | EPSPDNConnectionRequestType | 0..1 | Type of request as derived from the Request Type described in TS 24.301 [50] clause 9.9.4.14 and TS 24.008 [95] clause 10.5.6.17, if available. | C |
| accessType | AccessType | 0..1 | Access type associated with the PDN connection (i.e. 3GPP or non-3GPP access). | C |
| rATType | RATType | 0..1 | RAT Type associated with the PDN connection. Shall be present if included in the network message (see TS 29.274 [87] clauses 7.2.3, 7.2.4, 7.2.7, 7.2.8, 7.2.9, 7.2.10, 7.2.15 and 7.2.16) or known at the context at the SGW or PGW (see TS 23.401 [50] clause 5.7.4). | C |
| protocolConfigurationOptions | PDNProtocolConfigurationOptions | 0..1 | Shall be present if the network message (see TS 29.274 [87]) contains the Protocol Configuration Options, Additional Protocol Configuration Options or extended Protocol Configuration Options IE. See table 6.3.3-4. | C |
| servingNetwork | SMFServingNetwork | 0..1 | Shall be present if this IE is in the network message or the context for the PDN connection at the SGW/PGW. | C |
| sMPDUDNRequest | SMPDUDNRequest | 0..1 | Contents of the SM PDU DN Request container, if available, as described in TS 24.501 [13] clause 9.11.4.15. | C |
| bearerContextsCreated | SEQUENCE OF EPSBearerContextCreated | 0..MAX | Shall include a list of the Bearer Contexts created if the event that resulted in the generation of the message was the activation of a dedicated Bearer. Shall contain the contents of the Bearer Context field of the Create Bearer Response message (see TS 29.274 [87] clause 7.2.4). See table 6.3.3-2. | C |
| bearerContextsModified | SEQUENCE OF EPSBearerContextModified | 1..MAX | If the event that resulted in the generation of the message was the modification of an existing bearer, shall be populated from the contents of the Bearer Contexts Modified field of the Modify Bearer Response message (see TS 29.274 [87] clause 7.2.8) or the Bearer Contexts within the Update Bearer Response message (see TS 29.274 [87] clause 7.2.16).  If the event that resulted in the generation of the message was the establishment or release of a dedicated bearer context, then this field shall be populated with the information for the default bearer.  See table 6.3.3-9. | M |
| bearerContextsMarkedForRemoval | SEQUENCE OF EPSBearerContextForRemoval | 0..MAX | Shall include a list of the Bearer Contexts to be removed if the event that resulted in the generation of the message included the removal of an existing bearer. (see TS 29.274 [87] clause 7.2.8 and 7.2.10). See table 6.3.3-3. | C |
| bearersDeleted | SEQUENCE OF EPSBearersDeleted | 0..MAX | Shall include a list of the Bearers to be deleted if the event that resulted in the generation of the message included a Delete Bearer Request or Response. (see TS 29.274 [87] clauses 7.2.9 and 7.2.10). See table 6.3.3-10 | C |
| indicationFlags | PDNConnectionIndicationFlags | 0..1 | Shall be included if the Indication Flags field is present in the network message (see TS 29.274 [87] clauses 7.2.3, 7.2.4, 7.2.7, 7.2.8, 7.2.9, 7.2.10, 7.2.15 and 7.2.16). The value of this parameter shall be set to the value of the Indication IE (see TS 29.274 [87] clause 8.12) starting with octet 5. | C |
| handoverIndication | PDNHandoverIndication | 0..1 | Shall be present if the Handover Indication is set to 1 in the Modify Bearer Request (see TS 29.274 [87] clauses 7.2.7 and 8.12). | C |
| nBIFOMSupport | PDNNBIFOMSupport | 0..1 | Shall be present if the NBIFOM Support Indication is set to 1 in the message that triggered the generation of the xIRI or known at the context (see TS 29.274 [87] clauses 7.2.1, 7.2.7 and 8.12). | C |
| fiveGSInterworkingInfo | FiveGSInterworkingInfo | 0..1 | Shall be present if the 5GS Interworking Indication is present in the Create Session Request (see TS 29.274 [87] clauses 7.2.1 and 8.12). See table 6.3.3-5. | C |
| cSRMFI | CSRMFI | 0..1 | Shall be present if the Create Session Request Message Forwarded Indication (CSRMFI) is present in the Create Session Request (see TS 29.274 [87] clauses 7.2.1 and 8.12). Indicates the Create Session Request message has been forwarded by a PGW. | C |
| restorationOfPDNConnectionsSupport | RestorationOfPDNConnectionsSupport | 0..1 | Shall be present if the Restoration of PDN connection after an PGW-C/SMF Change Support Indication is present in the message that triggered the generation of the xIRI or known at the context (see TS 29.274 [87] clauses 7.2.1, 7.2.7 and 8.12). | C |
| pGWChangeIndication | PGWChangeIndication | 0..1 | Shall be present if the PGW Change Indication is present in the Create Session Request (see TS 29.274 [87] clauses 7.2.1 and 8.12). | C |
| pGWRNSI | PGWRNSI | 0..1 | Shall be present if the PGW Redirection due to mismatch with Network Slice subscribed by the UE Support Indication is present in the Create Session Request (see TS 29.274 [87] clauses 7.2.1 and 8.12). | C |

Table 6.3.3-9: Structure of the EPSBearerContextModified type

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| ePSBearerID | EPSBearerID | 1 | Shall include the EPS bearer ID for the EPS Bearer (see TS 29.274 [87] clauses 7.2.7, 7.2.8, 7.2.15 and 7.2.16). | M |
| cause | EPSBearerModificationCauseValue | 1 | Shall indicate whether the bearer handling was successful and if not, it gives information on the reason (see TS 29.274 [87] clauses 7.2.7, 7.2.8, 7.2.15 and 7.2.16). Sent as an integer cause value (see TS 29.274 [87] table 8.4-1) | M |
| gTPTunnelInfo | GTPTunnelInfo | 0..1 | Contains the information for the User Plane GTP Tunnels for the bearer context if present in the Request or Response (see TS 29.274 [87] clauses 7.2.7, 7.2.8, 7.2.15, 7.2.16 and 8.15) or known at the context at the SGW or PGW (see TS 23.401 [50] clause 5.7.4). See table 6.2.3-1B. | C |
| bearerQOS | EPSBearerQOS | 0..1 | Shall include the QOS information for the bearer if present in the Request or Response (see TS 29.274 [87] clauses 7.2.7, 7.2.8, 7.2.15, 7.2.16 and 8.15) or known at the context at the SGW or PGW (see TS 23.401 [50] clause 5.7.4). See table 6.3.3-7. | C |
| protocolConfigurationOptions | PDNProtocolConfigurationOptions | 0..1 | Shall be present if the Bearer Context reported (see TS 29.274 [87] clauses 7.2.7, 7.2.8, 7.2.15, 7.2.16 and 8.15) contains the Protocol Configuration, Additional Protocol Configuration Options or extended Protocol Configuration Options IE. See table 6.3.3-4. | C |
| linkedEPSBearerIDs | SEQUENCE OF EPSBearerID | 0..MAX | Shall be present if there are any linked EPS bearers. If the bearer context reported is the default bearer, then this list shall be populated with all dedicated bearers linked to that default bearer. If the bearer being reported is a dedicated bearer, then this field shall be populated with the default bearer. | C |

Table 6.3.3-10: Structure of the EPSBearersDeleted type

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| linkedEPSBearerID | EPSBearerID | 0..1 | Shall include the EBI for the default bearer associated with the PDN being disconnected if all bearers belonging to a PDN connection are being released (see TS 29.274 [87] clause 7.2.9). | C |
| ePSBearerIDs | SEQUENCE OF EPSBearerID | 0..MAX | Shall include a list of the EPS Bearer IDs to be deleted if only some of the EPS Bearers belonging to a PDN Connection are being released (see TS 29.274 [87] clause 7.2.9). | C |
| protocolConfigurationOptions | PDNProtocolConfigurationOptions | 0..1 | Shall be present if the Delete Bearer Request or Response reported (see TS 29.274 [87] clauses 7.2.9) contains the Protocol Configuration, Additional Protocol Configuration Options or extended Protocol Configuration Options IE. See table 6.3.3-4. | C |
| cause | EPSBearerDeletionCauseValue | 0..1 | Shall indicate the reason the EPS Bearers are being deleted (see TS 29.274 [87] clause 7.2.9). Sent as an integer cause value (see TS 29.274 [87] table 8.4-1) | C |
| deleteBearerResponse | EPSDeleteBearerResponse | 1 | Shall contain information from the Delete Bearer Response (see TS 29.274[87] clause 7.2.10). See table 6.3.3-11. | M |

Table 6.3.3-11: Structure of the EPSDeleteBearerResponse type

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| cause | EPSBearerDeletionCauseValue | 1 | Indicates whether the bearers requested for deletion were successfully deleted (see TS 29.274 [87] clause 7.2.10). | M |
| linkedEPSBearerID | EPSBearerID | 0..1 | Shall include the EBI for the default bearer associated with the PDN being disconnected if all bearers belonging to a PDN connection are being released (see TS 29.274 [87] clause 7.2.10). | C |
| bearerContexts | SEQUENCE OF EPSDeleteBearerContext | 0..MAX | Shall include a list of the EPS Bearer Contexts requested for deletion along with details on whether they were successfully deleted. Shall be included if only some of the EPS Bearers belonging to a PDN Connection are being released (see TS 29.274 [87] clause 7.2.10). See table 6.3.3-12. | C |
| protocolConfigurationOptions | PDNProtocolConfigurationOptions | 0..1 | Shall be present if the Delete Bearer Request or Response reported (see TS 29.274 [87] clauses 7.2.9) contains the Protocol Configuration, Additional Protocol Configuration Options or extended Protocol Configuration Options IE. See table 6.3.3-4. | C |

Table 6.3.3-12: Structure of the EPSDeleteBearerContext type

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| cause | EPSBearerDeletionCauseValue | 1 | Indicates whether the bearers requested for deletion were successfully deleted (see TS 29.274 [87] clause 7.2.10). | M |
| ePSBearerID | EPSBearerID | 1 | Shall include the EBI for the bearer (see TS 29.274 [87] clause 7.2.10). | M |
| protocolConfigurationOptions | PDNProtocolConfigurationOptions | 0..1 | Shall be present if the Delete Bearer Request or Response reported (see TS 29.274 [87] clauses 7.2.9) contains the Protocol Configuration, Additional Protocol Configuration Options or extended Protocol Configuration Options IE. See table 6.3.3-4. | C |
| rANNASCause | EPSRANNASCause | 0..1 | Shall be present if the RAN/NAS Release Cause is present in the delete session response bearer context (see TS 29.274 [87] clause 7.2.10). Shall be sent as an Octet String encoded as specified in TS 29.274 [87] clause 8.103. | C |

6.3.3.2.4 PDN Connection Release The IRI-POI in the SGW/PGW shall generate an xIRI containing an ePSPDNConnectionRelease record when the IRI-POI present in the SGW/PGW detects that a PDN Connection has been released for the target UE. The IRI-POI present in the SGW/PGW shall generate the xIRI for following events:

- The SGW/PGW releases an existing PDN Connection in the target UE context of the SGW/PGW (see TS 23.401 [50] clauses 5.7.3 and 5.7.4).

Table 6.3.3-13: Payload for EPSPDNConnectionRelease type/record

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| ePSSubscriberIDs | EPSSubscriberIDs | 1 | EPS Subscriber Identities associated with the PDN connection (e.g. as provided by the MME or SGW in the associated network message or as associated with the PDN connection in the context known at the NF). The IMSI shall be present except for unauthenticated emergency sessions. | M |
| iMSIUnauthenticated | IMSIUnauthenticatedIndication | 0..1 | Shall be present if an IMSI is present in the ePSSubscriberIDs and set to “true” if the IMSI has not been authenticated, or “false” if it has been authenticated. | C |
| defaultBearerID | EPSBearerID | 1 | Shall contain the EPS Bearer Identity of the default bearer associated with the PDN connection. | M |
| location | Location | 0..1 | Location information present in the network message (see TS 29.274 [87] clause 8.21) or known in the context at the SGW or PGW. | C |
| gTPTunnelInfo | GTPTunnelInfo | 0..1 | Contains the information for the Control Plane GTP Tunnels present in the network message or known in the context at the SGW or PGW. See Table 6.2.3-1B. If the gTPTunnelInfo received in the network message is different than the gTPTunnelInfo in the context for the PDN Connection, this message shall be populated with the new information. | C |
| rANNASCause | EPSRANNASCause | 0..1 | Shall be present if the RAN/NAS Release Cause is present in the delete session request (see TS 29.274 [87] clause 7.2.9). | C |
| pDNConnectionType | PDNConnectionType | 1 | Identifies selected PDN session type, see TS 29.274 [13] clause 8.34. | M |
| indicationFlags | PDNConnectionIndicationFlags | 0..1 | Shall be included if the Indication Flags field is present in the network message (see TS 29.274 [87] clauses 7.2.3, 7.2.4, 7.2.7, 7.2.8, 7.2.9, 7.2.10, 7.2.15 and 7.2.16). The value of this parameter shall be set to the value of the Indication IE (see TS 29.274 [87] clause 8.12) starting with octet 5. | C |
| scopeIndication | EPSPDNConnectionReleaseScopeIndication | 0..1 | This flag shall be present and set to True, if the request corresponds to TAU/RAU/Handover with SGW change/SRNS Relocation Cancel Using S4 with SGW change, Inter RAT handover Cancel procedure with SGW change, S1 Based handover Cancel procedure with SGW change. If this parameter is absent, it shall be interpreted as False. | C |
| bearersDeleted | SEQUENCE OF EPSBearersDeleted | 0..MAX | Shall include a list of the Bearers to be deleted if the event that resulted in the generation of the message included a Delete Bearer Request or Response. (see TS 29.274 [87] clauses 7.2.9 and 7.2.10). See Table 6.3.3-10 | C |

##### 6.3.3.2.5 Start of Interception with Already Established PDN Connection

The IRI-POI in the SGW/PGW shall generate an xIRI containing an ePSStartOfInterceptionWithEstablishedPDNConnection record when the IRI-POI present in the SGW/PGW detects that a PDN Connection has already been established for the target UE when interception starts. The IRI-POI present in the SGW/PGW shall generate the xIRI for following events:

- The SGW/PGW has an existing PDN Connection in the target UE context of the SGW/PGW (see TS 23.401 [50] clause 5.7.4).

Table 6.3.3-14: Payload for EPSStartOfInterceptionWithEstablishedPDNConnection type/record

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| ePSSubscriberIDs | EPSSubscriberIDs | 1 | EPS Subscriber Identities associated with the PDN connection (as associated with the PDN connection in the context known at the NF). The IMSI shall be present except for unauthenticated emergency sessions. | M |
| iMSIUnauthenticated | IMSIUnauthenticatedIndication | 0..1 | Shall be present if an IMSI is present in the ePSSubscriberIDs and set to “true” if the IMSI has not been authenticated, or “false” if it has been authenticated. | C |
| defaultBearerID | EPSBearerID | 1 | Shall contain the EPS Bearer Identity of the default bearer associated with the PDN connection. | M |
| gTPTunnelInfo | GTPTunnelInfo | 0..1 | Contains the information for the Control Plane GTP Tunnels known in the context at the SGW or PGW. See Table 6.2.3-1B. | C |
| pDNConnectionType | PDNConnectionType | 1 | Identifies selected PDN session type, see TS 29.274 [87] clause 8.34. | M |
| uEEndpoints | SEQUENCE OF UEEndpointAddress | 0..MAX | UE endpoint address(es) if available. Derived from the PDN Address portion of the PDN Address Allocation parameter (see TS 29.274 [87] clause 8.14) associated to the PDN Connection in the context known at the NF (see TS 23.401 [50] clauses 5.7.3 and 5.7.4). | C |
| non3GPPAccessEndpoint | UEEndpointAddress | 0..1 | UE's local IP address used to reach the ePDG, if known at the context at the SGW or PGW. | C |
| location | Location | 0..1 | Location information known in the context at the SGW or PGW. | C |
| additionalLocation | Location | 0..1 | Additional location information known in the context at the SGW or PGW, or known at the MDF. | C |
| aPN | APN | 1 | Access Point Name associated with the PDN known at the context at the SGW or PGW (see TS 23.401 [50] clause 5.7.4), as defined in TS 23.003[19] clause 9.1. | M |
| requestType | EPSPDNConnectionRequestType | 0..1 | Type of request as derived from the Request Type described in TS 24.301 [50] clause 9.9.4.14 and TS 24.008 [95] clause 10.5.6.17, if available. | C |
| accessType | AccessType | 0..1 | Access type associated with the PDN connection (i.e. 3GPP or non-3GPP access). | C |
| rATType | RATType | 0..1 | RAT Type associated with the PDN connection. Shall be present if known at the context at the SGW or PGW (see TS 23.401 [50] clause 5.7.4). | C |
| protocolConfigurationOptions | PDNProtocolConfigurationOptions | 0..1 | Shall be present the Protocol Configuration, Additional Protocol Configuration Options or extended Protocol Configuration Options are known in the context at the SGW or PGW. See Table 6.3.3-4. | C |
| servingNetwork | SMFServingNetwork | 0..1 | Shall be present if this IE is in the context for the PDN connection at the SGW/PGW. | C |
| sMPDUDNRequest | SMPDUDNRequest | 0..1 | Contents of the SM PDU DN Request container, if available, as described in TS 24.501 [13] clause 9.11.4.15. | C |
| bearerContexts | SEQUENCE OF EPSBearerContext | 1..MAX | Shall include a list of the Bearer Contexts present in the UE Context (see TS 23.401 [50] clauses 5.7.3 and 5.7.4). See Table 6.3.3-2. | M |

##### 6.3.3.2.6 VOID

##### 6.3.3.2.7 VOID

##### 6.3.3.2.8 VOID

##### 6.3.3.2.9 VOID

6.3.3.2.10 EPS PDN unsuccessful procedure

The IRI-POI in the SGW/PGW shall generate an xIRI containing an ePSPDNUnsuccessfulProcedure record when the IRI-POI present in the SGW/PGW detects an unsuccessful procedure or error condition for a UE matching one of the target identifiers provided via LI\_X1.

**Table 6.3.3.2.8-1: Payload for EPSPDNUnsuccessfulProcedure type/record**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Cardinality** | **Description** | **M/C/O** |
| failureCause | ESMCause | 1 | Provides the value of the ESM cause, see TS 24.301 [50] clause 9.9.4.4. Sent as an integer cause value (see TS 29.274 [87] table 8.4-1). In case the procedure is aborted due to a ESM STATUS message, the ESM cause is the one included in the ESM status message. | M |
| initiator | Initiator | 1 | Specifies whether the network (SGW) or the UE is initiating the rejection or indicating the failure. | M |
| ePSSubscriberIDs | EPSSubscriberIDs | 1 | EPS Subscriber Identities associated with the PDN connection (e.g. as provided by the MME or SGW in the associated Create Session Request or as associated with the PDN connection in the context known at the NF). The IMSI shall be present except for unauthenticated emergency sessions. | M |
| iMSIUnauthenticated | IMSIUnauthenticatedIndication | 0..1 | Shall be present if an IMSI is present in the ePSSubscriberIDs and set to “true” if the IMSI has not been authenticated, or “false” if it has been authenticated. | C |
| failedProcedure | EPSPDNFailedProcedure | 1 | Contains the record corresponding to the failed procedure. See Table 6.3.3.2.8-2 | M |

**Table 6.3.3.2.8-2: Definition of Choices for EPSPDNFailedProcedure**

|  |  |  |
| --- | --- | --- |
| **CHOICE** | **Type** | **Description** |
| ePSPDNConnectionEstablishment | EPSPDNConnectionEstablishment | Shall be used to report a failed EPS PDN connection establishment. |
| ePSPDNConnectionModification | EPSPDNConnectionModification | Shall be used to report a failed EPSPDNConnectionModification |
| ePSPDNConnectionRelease | EPSPDNConnectionRelease | Shall be used to report a failed EPS PDN connection release. |

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

#### 6.3.3.4 Generation of IRI over LI\_HI2

##### 6.3.3.4.1 General

When Option A or Option B specified in clause 6.3.1 are used and an xIRI is received over LI\_X2 from the IRI-POI in the SGW/PGW or ePDG, the MDF2 shall generate the corresponding IRI message and deliver it over LI\_HI2 without undue delay. The IRI message shall contain a copy of the relevant record received in the xIRI over LI\_X2.When Option C specified in clause 6.3.1 is used, the MDF2 shall generate IRI messages based on the proprietary information received from the SGW/PGW or ePDG and provide it over LI\_HI2 without undue delay.

The IRI record may be enriched with any additional information available at the MDF (e.g. additional location information).

When Option A specified in clause 6.3.1 is used, LI\_HI2 shall be realised as described in clause 6.3.3.4.2.

When Option B or Option C specified in clause 6.3.1 is used, LI\_HI2 shall be realised as described in clause 6.3.3.4.3.

##### 6.3.3.4.2 Option A

The IRI message the MDF2 generates shall contain a copy of the relevant record received in the xIRI over LI\_X2 and provide it over LI\_HI2 without undue delay.

The ETSI TS 102 232-1 [9] *@LI-PS-PDU.pSHeader.timeStamp* field shall be set to the time at which the SGW/PGW event was observed (i.e. the timestamp field of the xIRI).

The *@LI-PS-PDU.payload.iRIPayloadSequence.iRIType* parameter (see ETSI TS 102 232-1 [9] clause 5.2.10) shall be included and coded according to table 6.3.3.4.2-1.

Table 6.3.3.4.2-1: IRI type for IRI messages

|  |  |
| --- | --- |
| Record type | IRI Type |
| EPSPDNConnectionEstablishment | BEGIN |
| EPSPDNConnectionModification | END |
| EPSPDNConnectionRelease | CONTINUE |
| EPSStartOfInterceptionWithEstablishedPDNConnection | BEGIN |
| EPSPDNUnsuccessfulProcedure | REPORT |

IRI messages associated with the same PDN Connection shall be assigned the same CIN (see ETSI TS 102 232-1 [9] clause 5.2.4).

In the case of EPS/5GS interworking, all IRI messages associated with the same PDU Session (see TS 29.502 [16] clause 6.1.6.2.31), including EPS PDN connection messages for associted PDN Connections shall be assigned the same CIN (see ETSI TS 102 232-1 [9] clause 5.2.4).

The *@LI-PS-PDU.payload.iRIPayloadSequence.iRIContents.threeGPP33128DefinedIRI* field (see ETSI TS 102 232-7 [10] clause 15) of the LI\_HI2 message shall be populated with the BER-encoded *IRIPayload*.

When an additional warrant is activated on a target UE and the LIPF uses the same XID for the additional warrant, the MDF2 shall be able to generate and deliver the IRI message containing the EPSStartOfInterceptionWithEstablishedPDNConnection record to the LEMF associated with the additional warrant without receiving a corresponding xIRI. The payload of the EPSStartOfInterceptionWithEstablishedPDNConnection record is specified in table 6.3.3-14. The MDF2 shall generate and deliver the IRI message containing the EPSStartOfInterceptionWithEstablishedPDNConnection record for each of the established PDN connection to the LEMF associated with the new warrant.

When the delivery of packet header information is authorised and approach 2 described in clause 6.2.3.9.1 is used, the MDF2 shall generate the IRI message and send it over LI\_HI2 without undue delay when xCC is received over LI\_MDF from the MDF3. The MDF2 shall generate packet header information reporting as described in clause 6.2.3.5.

##### 6.3.3.4.3 Option B and C

The IRI messages shall include an IRI payload encoded according to clause 10.5 and TS 33.108 [12] Annex B.9. The MDF2 shall encode the correct value of LIID in the IRI message, replacing the value "LIIDNotPresent" given in the xIRI (see clause 6.3.2.2).

\*\*\*\* END OF MAIN DOCUMENT CHANGES \*\*\*\*

\*\*\*\* START OF FIRST CHANGE (ATTACHMENT TS33128Payloads.asn) \*\*\*\*

---a/33128/r18/TS33128Payloads.asn  
+++b/33128/r18/TS33128Payloads.asn

@@ -287,7 +287,16 @@ XIRIEvent ::= CHOICE

287 287

288 288 -- MMS-related events continued from choice 35

289 289 mMSConvertedFromEmail [165] MMSConvertedFromEmail,

290 - mMSConvertedToEmail [166] MMSConvertedToEmail

290 + mMSConvertedToEmail [166] MMSConvertedToEmail,

291 +

292 + -- Tags 167 to 175 are not used in this version of the specification

293 +

294 + -- SGW events, see clause 6.3.3.2

295 + ePSPDNConnectionEstablishment [176] EPSPDNConnectionEstablishment,

296 + ePSPDNConnectionModification [177] EPSPDNConnectionModification,

297 + ePSPDNConnectionRelease [178] EPSPDNConnectionRelease,

298 + ePSStartOfInterceptionWithEstablishedPDNConnection [179] EPSStartOfInterceptionWithEstablishedPDNConnection,

299 + ePSPDNUnsuccessfulProcedure [180] EPSPDNUnsuccessfulProcedure

291 300 }

292 301

293 302 -- ==============

@@ -558,7 +567,16 @@ IRIEvent ::= CHOICE

558 567

559 568 -- MMS-related events continued from choice 35

560 569 mMSConvertedFromEmail [165] MMSConvertedFromEmail,

561 - mMSConvertedToEmail [166] MMSConvertedToEmail

570 + mMSConvertedToEmail [166] MMSConvertedToEmail,

571 +

572 + -- Tags 167 to 175 are not used in this version of the specification

573 +

574 + -- SGW events, see clause 6.3.3.2

575 + ePSPDNConnectionEstablishment [176] EPSPDNConnectionEstablishment,

576 + ePSPDNConnectionModification [177] EPSPDNConnectionModification,

577 + ePSPDNConnectionRelease [178] EPSPDNConnectionRelease,

578 + ePSStartOfInterceptionWithEstablishedPDNConnection [179] EPSStartOfInterceptionWithEstablishedPDNConnection,

579 + ePSPDNUnsuccessfulProcedure [180] EPSPDNUnsuccessfulProcedure

562 580 }

563 581

564 582 IRITargetIdentifier ::= SEQUENCE

@@ -2332,7 +2350,8 @@ SMFUnsuccessfulProcedure ::= SEQUENCE

2332 2350 accessType [16] AccessType OPTIONAL,

2333 2351 rATType [17] RATType OPTIONAL,

2334 2352 sMPDUDNRequest [18] SMPDUDNRequest OPTIONAL,

2335 - location [19] Location OPTIONAL

2353 + location [19] Location OPTIONAL,

2354 + ePSPDNUnsuccessfulProcedure [20] EPSPDNUnsuccessfulProcedure OPTIONAL

2336 2355 }

2337 2356

2338 2357 -- See clause 6.2.3.2.8 for details of this structure

@@ -2899,6 +2918,15 @@ EPSStartOfInterceptionWithEstablishedPDNConnection ::= SEQUENCE

2899 2918 bearerContexts [17] SEQUENCE OF EPSBearerContext

2900 2919 }

2901 2920

2921 + EPSPDNUnsuccessfulProcedure ::= SEQUENCE

2922 + {

2923 + failureCause [1] ESMCause,

2924 + initiator [2] Initiator,

2925 + ePSSubscriberIDs [3] EPSSubscriberIDs,

2926 + iMSIUnauthenticated [4] IMSIUnauthenticatedIndication OPTIONAL,

2927 + failedProcedure [5] EPSPDNFailedProcedure

2928 + }

2929 +

2902 2930 PFDDataForApps ::= SET OF PFDDataForApp

2903 2931

2904 2932 PFDDataForApp ::= SEQUENCE

@@ -3089,6 +3117,13 @@ EPSPDNConnectionRequestType ::= ENUMERATED

3089 3117

3090 3118 EPSPDNConnectionReleaseScopeIndication ::= BOOLEAN

3091 3119

3120 + EPSPDNFailedProcedure ::= CHOICE

3121 + {

3122 + ePSPDNConnectionEstablishment [1] EPSPDNConnectionEstablishment,

3123 + ePSPDNConnectionModification [2] EPSPDNConnectionModification,

3124 + ePSPDNConnectionRelease [3] EPSPDNConnectionRelease

3125 + }

3126 +

3092 3127 FiveGSInterworkingInfo ::= SEQUENCE

3093 3128 {

3094 3129 fiveGSInterworkingIndicator [1] FiveGSInterworkingIndicator,

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