**3GPP TSG- Meeting #**

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
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|  |  | **CR** |  | **rev** |  | **Current version:** |  |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

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| ***Title:***  |  |
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| ***Source to WG:*** |  |
| ***Source to TSG:*** |  |
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| ***Work item code:*** |  |  | ***Date:*** |  |
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| ***Category:*** |  |  | ***Release:*** |  |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-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 0715 is the Release 18 mirror for this CR.Schema changes for this CR can be found on the Forge:Merge Request: [!309](https://forge.3gpp.org/rep/sa3/li/-/merge_requests/309)Commit Hash: [d9d28cb41b59f40da70515c9608399dd32ad45eb](https://forge.3gpp.org/rep/sa3/li/-/merge_requests/309/diffs?commit_id=d9d28cb41b59f40da70515c9608399dd32ad45eb)  |
|  |  |
| ***This CR's revision history:*** | S3i250033, S3i250051, s3i250054 |

\*\*\*\* START OF FIRST 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.

Option A may be used in implementations that do not include EPS/5GS interworking.

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) \*\*\*\*

\*\*\*\* 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.

\*\*\*\* 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. The details of the messages for single-access PDU sessions are provided in clauses 6.3.3.2.2, 6.3.3.2.3, 6.3.3.2.4 and 6.3.3.2.5. The details for the messages for MA PDU sessions are provided in clauses 6.3.3.2.6, 6.3.3.2.7, 6.3.3.2.8 and 6.3.3.2.9.

- 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 or PDU Session Establishment in interworked EPS/5GS

In the case of standalone EPS, 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).

In the case of interworked EPS/5GS, the IRI-POI in the SMF+PGW-C shall generate an xIRI containing an SMFPDUSessionEstablishment record (see clause 6.2.3.2.2) when the IRI-POI present in the SMF+PGW-C detects that a single-access PDU Session or PDN Connection has been established for the target UE. The IRI-POI present in the SMF+PGW-C shall generate the xIRI for the following events:

- The SMF+PGW-C creates a new PDN Connection in the target UE context of the SMF+PGW-C (see TS 23.401 [50] clause 5.7.4).

- The SMF+PGW-C 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).

When the SMFPDUSessionEstablishment record (see clause 6.2.3.2.2) is used to report the creation of a new PDN Connection:

- The ePSPDNConnectionEstablishment field shall be populated with the information in table 6.3.3.2.2-1.

- If there is no SUPI associated to the SM context for the target UE, the SUPI field of the SMFPDUSessionEstablishment record shall be populated with the value of the IMSI from the target UE context.

- If there is no PDU Session ID present in the PCO of the request or response messages or associated to the context for the PDN connection, the pDUSessionID field of the SMFPDUSessionEstablishment record shall be populated with the EBI of the default bearer for the PDN Connection.

- If there is no 5G UP tunnel present in the context associated to the PDN Connection, the gTPTunnelID field of the SMFPDUSessionEstablishment record shall be populated with the F-TEID for the PGW S5 or S8 interface for the default bearer of the PDN Connection.

**Table 6.3.3.2.2-1: 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 6.2.3.2.2-3. | 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 | 0..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 5.6.4). | 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 6.3.3.2.2-4. | 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 6.3.3.2.2-2.  | 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 6.3.3.2.2-3. | 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 6.3.3.2.2-5. | 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 6.3.3.2.2-2: Structure of EPSBearerContextsCreated 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 6.2.3.2.2-3. | 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 6.3.3.2.2-7. | 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 7.6.3.3.2.2-4. | C |

**Table 6.3.3.2.2-3: Structure of EPSBearerContextsMarkedForRemoval 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 6.3.3.2.2-4: Structure of PDNProtocolConfigurationOptions type**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **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 6.3.3.2.2-5: 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 6.3.3.2.2-6: 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 6.3.3.2.2-7: 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 or PDU Session Modification in interworked EPS/5GS or inter-system handover

In the case of standalone EPS, 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 SMF+PGW-C shall generate an xIRI containing an SMFPDUSessionModification record (see clause 6.2.3.2.3) when the IRI-POI present in the SMF+PGW-C detects that a single-access PDU Session or PDN Connection has been modified for the target UE. The IRI-POI present in the SMF+PGW-C shall generate the xIRI for the following events:

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

- The SMF+PGW-C 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).

- 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).

When the SMFPDUSessionModification record (see clause 6.2.3.2.3) is used to report the modification of a PDN Connection:

- The ePSPDNConnectionModification field shall be populated with the information in table 6.3.3.2.3-1.

- If there is no SUPI associated to the SM context for the target UE, the SUPI field of the SMFPDUSessionModification record shall be populated with the value of the IMSI from the target UE context.

- If there is no PDU Session ID present in the PCO of the request or response messages or associated to the context for the PDN connection, the pDUSessionID field of the SMFPDUSessionModification record shall be populated with the EBI of the default bearer for the PDN Connection.

- If there is no 5G UP tunnel present in the context associated to the PDN Connection, the gTPTunnelID field of the SMFPDUSessionModification record shall be populated with the F-TEID for the PGW S5 or S8 interface for the default bearer of the PDN Connection.

**Table 6.3.3.2.3-1: Payload for EPSPDNConnectionModification 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 6.2.3.2.2-3. 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 6.3.3.2.2-4. | 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 6.3.3.2.2-2.  | 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 6.3.3.2.3-2. | 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 6.3.3.2.2-3. | 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 6.3.3.2.3-3 | 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 6.3.3.2.2-5. | 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 6.3.3.2.3-2: 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 6.2.3.2.2-3. | 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 6.3.3.2.2-7. | 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 6.3.3.2.2-4. | 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 6.3.3.2.3-3: 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 6.3.3.2.2-4. | 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 6.3.3.2.3-4. | M |

**Table 6.3.3.2.3-4: 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 6.3.3.2.3-5. | 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 6.3.3.2.2-4. | C |

**Table 6.3.3.2.3-5: 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 6.3.3.2.2-4. | 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 or PDU Session Release in interworked EPS/5GS

In the case of standalone EPS, 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).

In the case of interworked EPS/5GS, the IRI-POI in the SMF+PGW-C shall generate an xIRI containing an SMFPDUSessionRelease record (see clause 6.2.3.2.4) when the IRI-POI present in the SMF+PGW-C detects that a single-access PDU Session or PDN Connection has been released for the target UE. The IRI-POI present in the SMF+PGW-C shall generate the xIRI for the following events:

- The SMF+PGW-C releases an existing PDN Connection in the target UE context of the SMF+PGW-C (see TS 23.401 [50] clause 5.7.4).

- The SMF+PGW-C 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).

When the SMFPDUSessionRelease record (see clause 6.2.3.2.4) is used to report the release of a PDN Connection:

- The ePSPDNConnectionRelease field shall be populated with the information in table 6.3.3.2.4-1.

- If there is no SUPI associated to the SM context for the target UE, the SUPI field of the SMFPDUSessionRelease record shall be populated with the value of the IMSI from the target UE context.

- If there is no PDU Session ID present in the PCO of the request or response messages or associated to the context for the PDN connection, the pDUSessionID field of the SMFPDUSessionRelease record shall be populated with the EBI of the default bearer for the PDN Connection.

- If there is no 5G UP tunnel present in the context associated to the PDN Connection, the gTPTunnelID field of the SMFPDUSessionRelease record shall be populated with the F-TEID for the PGW S5 or S8 interface for the default bearer of the PDN Connection.

**Table 6.3.3.2.4-1: Payload for EPSPDNConnectionRelease 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 6.2.3.2.2-3. 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 6.3.3.2.3-3 | C |

6.3.3.2.5 Start of Interception with Already Established PDN Connection or SMF Start of Interception with Already Established PDU Session in interworked EPS/5GSIn the case of standalone EPS, 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).

In the case of interworked EPS/5GS, the IRI-POI in the SMF+PGW-C shall generate an xIRI containing an SMFStartOfInterceptionWithEstablishedPDUSession record (see clause 6.2.3.2.5) when the IRI-POI present in the SMF+PGW-C detects that a single-access PDU Session or PDN Connection has already been established for the target UE when interception starts. The IRI-POI present in the SMF+PGW-C shall generate the xIRI for the following events:

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

- The SMF+PGW-C 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).

When the SMFStartOfInterceptionWithEstablishedPDUSession record (see clause 6.2.3.2.5) is used to report an existing PDN Connection:

- The ePSStartOfInterceptionWithEstablishedPDNConnection field shall be populated with the information in table 6.3.3.2.5-1.

- If there is no SUPI associated to the SM context for the target UE, the SUPI field of the SMFStartOfInterceptionWithEstablishedPDUSession record shall be populated with the value of the IMSI from the target UE context.

- If there is no PDU Session ID associated to the context for the PDN connection, the pDUSessionID field of the SMFStartOfInterceptionWithEstablishedPDUSession record shall be populated with the EBI of the default bearer for the PDN Connection.

- If there is no 5G UP tunnel present in the context associated to the PDN Connection, the gTPTunnelID field of the SMFStartOfInterceptionWithEstablishedPDNConnection record shall be populated with the F-TEID for the PGW S5 or S8 interface for the default bearer of the PDN Connection.

**Table 6.3.3.2.5-1: Payload for EPSStartOfInterceptionWithEstablishedPDNConnection 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 6.2.3.2.2-3. | C |
| pDNConnectionType | PDNConnectionType | 0..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 6.3.3.2.2-4. | 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 6.3.3.2.2-2. | M |

6.3.3.2.6 MA PDU Session Establishment message in interworked EPS/5GSThe IRI-POI in the SMF+PGW-C shall generate an xIRI containing an SMFMAPDUSessionEstablishment record (see clause 6.2.3.2.7) when the IRI-POI present in the SMF+PGW-C detects that a PDN Connection has been established for the target UE and associated to a multi-access PDU Session. The IRI-POI present in the SMF+PGW-C shall generate the xIRI for the following events:

- The SMF+PGW-C creates a new PDN Connection in the target UE context of the SMF+PGW-C (see TS 23.401 [50] clause 5.7.4) and it is associated to an MA PDU session as described in TS 23.502 [4] clause 4.22.2.3.

- The SMF+PGW-C 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).

When the SMFMAPDUSessionEstablishment record (see clause 6.2.3.2.7) is used to report the creation of a new PDN Connection:

- The ePSPDNConnectionEstablishment field shall be populated with the information in table 6.3.3-1.

- If there is no SUPI associated to the SM context for the target UE, the SUPI field of the SMFMAPDUSessionEstablishment record shall be populated with the value of the IMSI from the target UE context.

- If there is no PDU Session ID present in the PCO of the request or response messages or associated to the context for the PDN connection, the pDUSessionID field of the SMFMAPDUSessionEstablishment record shall be populated with the EBI of the default bearer for the PDN Connection.

- If there is no 5G UP tunnel present in the context associated to the PDN Connection, the gTPTunnelID field of the SMFMAPDUSessionEstablishment record shall be populated with the F-TEID for the PGW S5 or S8 interface for the default bearer of the PDN Connection.

6.3.3.2.7 MA PDU Session Modification message in interworked EPS/5GS

The IRI-POI in the SMF+PGW-C shall generate an xIRI containing an SMFMAPDUSessionModification record (see clause 6.2.3.2.7) when the IRI-POI present in the SMF+PGW-C detects that an MA PDU Session or PDN Connection associated to an MA PDU Session has been modified for the target UE. The IRI-POI present in the SMF+PGW-C shall generate the xIRI for the following events:

- The SMF+PGW-C modifies an existing PDN Connection associated to an MA PDU Session in the target UE context of the SMF+PGW-C (see TS 23.401 [50] clause 5.7.4).

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

- The SMF+PGW-C transfers an existing PDN Connection associated to an MA PDU Session to 5GS (see TS 23.502 [4] clause 4.22.6).

When the SMFMAPDUSessionModification record (see clause 6.2.3.2.7) is used to report the modification of a PDN Connection:

- The ePSPDNConnectionModification field shall be populated with the information in table 6.3.3.2.3-1.

- If there is no SUPI associated to the SM context for the target UE, the SUPI field of the SMFMAPDUSessionModification record shall be populated with the value of the IMSI from the target UE context.

- If there is no PDU Session ID present in the PCO of the request or response messages or associated to the context for the PDN connection, the pDUSessionID field of the SMFMAPDUSessionModification record shall be populated with the EBI of the default bearer for the PDN Connection.

- If there is no 5G UP tunnel present in the context associated to the PDN Connection, the gTPTunnelID field of the SMFMAPDUSessionModification record shall be populated with the F-TEID for the PGW S5 or S8 interface for the default bearer of the PDN Connection.

6.3.3.2.8 MA PDU Session Release message in interworked EGPS/5GS

The IRI-POI in the SMF+PGW-C shall generate an xIRI containing an SMFMAPDUSessionRelease record (see clause 6.2.3.2.7) when the IRI-POI present in the SMF+PGW-C detects that an MA PDU Session or PDN Connection associated to an MA PDU Session has been released for the target UE. The IRI-POI present in the SMF+PGW-C shall generate the xIRI for the following events:

- The SMF+PGW-C releases an existing PDN Connection associated to an MA PDU Session in the target UE context of the SMF+PGW-C (see TS 23.401 [50] clause 5.7.4).

- The SMF+PGW-C 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).

When the SMFMAPDUSessionRelease record (see clause 6.2.3.2.7) is used to report the release of a PDN Connection:

- The ePSPDNConnectionRelease field shall be populated with the information in table 6.3.3.2.4-1.

- If there is no SUPI associated to the SM context for the target UE, the SUPI field of the SMFMAPDUSessionRelease record shall be populated with the value of the IMSI from the target UE context.

- If there is no PDU Session ID present in the PCO of the request or response messages or associated to the context for the PDN connection, the pDUSessionID field of the SMFMAPDUSessionRelease record shall be populated with the EBI of the default bearer for the PDN Connection.

- If there is no 5G UP tunnel present in the context associated to the PDN Connection, the gTPTunnelID field of the SMFMAPDUSessionRelease record shall be populated with the F-TEID for the PGW S5 or S8 interface for the default bearer of the PDN Connection.

6.3.3.2.9 SMF Start of Interception with Already Established MA PDU Session in interworked EPS/5GS

The IRI-POI in the SMF+PGW-C shall generate an xIRI containing an SMFStartOfInterceptionWithEstablishedMAPDUSession record (see clause 6.2.3.2.7) when the IRI-POI present in the SMF+PGW-C detects that an MA PDU Session or PDN Connection associated to an MA PDU Session has already been established for the target UE when interception starts. The IRI-POI present in the SMF+PGW-C shall generate the xIRI for the following events:

- The SMF+PGW-C has an existing PDN Connection associated to an MA PDU Session in the target UE context of the SMF+PGW-C (see TS 23.401 [50] clause 5.7.4).

- The SMF+PGW-C 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).

When the SMFStartOfInterceptionWithEstablishedMAPDUSession record (see clause 6.2.3.2.7) is used to report an existing PDN Connection:

- The ePSStartOfInterceptionWithEstablishedPDNConnection field shall be populated with the information in table 6.3.3.2.5-1.

- If there is no SUPI associated to the SM context for the target UE, the SUPI field of the SMFStartOfInterceptionWithEstablishedMAPDUSession record shall be populated with the value of the IMSI from the target UE context.

- If there is no PDU Session ID associated to the context for the PDN connection, the pDUSessionID field of the SMFStartOfInterceptionWithEstablishedMAPDUSession record shall be populated with the EBI of the default bearer for the PDN Connection.

- If there is no 5G UP tunnel present in the context associated to the PDN Connection, the gTPTunnelID field of the SMFStartOfInterceptionWithEstablishedMAPDUSession record shall be populated with the F-TEID for the PGW S5 or S8 interface for the default bearer of the PDN Connection.

6.3.3.2.8 EPS PDN unsuccessful procedure or SMF unsuccessful procedure in interworked EPS/5GS

In the case of standalone EPS, 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.

In the case of interworked EPS/5GS, the IRI-POI in the SMF+PGW-C shall generate an xIRI containing an SMFUnsuccessfulProcedure record (see clause 6.2.3.2.6) when the IRI-POI present in the SMF+PGW-C detects that an unsuccessful procedure or error condition for a UE matching one of the target identifiers provided via LI\_X1.single-access PDU Session or PDN Connection has already been established for the target UE when interception starts. The IRI-POI present in the SMF+PGW-C shall generate the xIRI for the following events:

- 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.

When the SMFUnsuccessfulProcedure record (see clause 6.2.3.2.6) is used to report an unsuccessful EPS PDN related procedure:

- The ePSPDNUnsuccessfulProcedure field shall be populated with the information in Table 6.3.3.2.8-1.

- If there is no SUPI associated to the SM context for the target UE, the SUPI field of the SMFStartOfInterceptionWithEstablishedPDUSession record shall be populated with the value of the IMSI from the target UE context.

- If there is no PDU Session ID associated to the context for the PDN connection, the pDUSessionID field of the SMFUnsuccessfulProcedure record shall be populated with the EBI of the default bearer for the PDN Connection.

- If there is no 5G UP tunnel present in the context associated to the PDN Connection, the gTPTunnelID field of the SMFStartOfInterceptionWithEstablishedPDUSession record shall be populated with the F-TEID for the PGW S5 or S8 interface for the default bearer of the PDN Connection.

**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).

The IRI messages shall be delivered over LI\_HI2 according to ETSI TS 102 232-7 [10] clause 10.

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).

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).

The IRI messages shall be delivered over LI\_HI2 according to ETSI TS 102 232-7 [10] clause 10.

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

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

---a/33128/r19/TS33128Payloads.asn
+++b/33128/r19/TS33128Payloads.asn

@@ -304,7 +304,14 @@ XIRIEvent ::= CHOICE

304 304 iMSHSSSubscriberRecordChange [174] IMSHSSSubscriberRecordChange,

305 305

306 306 -- AMF events, see clause 6.2.2.2.14, continued from tag 147

307 - aMFUEContextUpdate [175] AMFUEContextUpdate

 307 + aMFUEContextUpdate [175] AMFUEContextUpdate,

 308 +

 309 + -- SGW events, see clause 6.3.3.2

 310 + ePSPDNConnectionEstablishment [176] EPSPDNConnectionEstablishment,

 311 + ePSPDNConnectionModification [177] EPSPDNConnectionModification,

 312 + ePSPDNConnectionRelease [178] EPSPDNConnectionRelease,

 313 + ePSStartOfInterceptionWithEstablishedPDNConnection [179] EPSStartOfInterceptionWithEstablishedPDNConnection,

 314 + ePSPDNUnsuccessfulProcedure [180] EPSPDNUnsuccessfulProcedure

308 315 }

309 316

310 317 -- ==============

@@ -592,7 +599,14 @@ IRIEvent ::= CHOICE

592 599 iMSHSSSubscriberRecordChange [174] IMSHSSSubscriberRecordChange,

593 600

594 601 -- AMF events, see clause 6.2.2.3, continued from tag 147

595 - aMFUEContextUpdate [175] AMFUEContextUpdate

 602 + aMFUEContextUpdate [175] AMFUEContextUpdate,

 603 +

 604 + -- SGW events, see clause 6.3.3.2

 605 + ePSPDNConnectionEstablishment [176] EPSPDNConnectionEstablishment,

 606 + ePSPDNConnectionModification [177] EPSPDNConnectionModification,

 607 + ePSPDNConnectionRelease [178] EPSPDNConnectionRelease,

 608 + ePSStartOfInterceptionWithEstablishedPDNConnection [179] EPSStartOfInterceptionWithEstablishedPDNConnection,

 609 + ePSPDNUnsuccessfulProcedure [180] EPSPDNUnsuccessfulProcedure

596 610 }

597 611

598 612 IRITargetIdentifier ::= SEQUENCE

@@ -2452,7 +2466,8 @@ SMFUnsuccessfulProcedure ::= SEQUENCE

2452 2466 accessType [16] AccessType OPTIONAL,

2453 2467 rATType [17] RATType OPTIONAL,

2454 2468 sMPDUDNRequest [18] SMPDUDNRequest OPTIONAL,

2455 - location [19] Location OPTIONAL

 2469 + location [19] Location OPTIONAL,

 2470 + ePSPDNUnsuccessfulProcedure [20] EPSPDNUnsuccessfulProcedure OPTIONAL

2456 2471 }

2457 2472

2458 2473 -- See clause 6.2.3.2.8 for details of this structure

@@ -3019,6 +3034,16 @@ EPSStartOfInterceptionWithEstablishedPDNConnection ::= SEQUENCE

3019 3034 bearerContexts [17] SEQUENCE OF EPSBearerContext

3020 3035 }

3021 3036

 3037 + EPSPDNUnsuccessfulProcedure ::= SEQUENCE

 3038 + {

 3039 + failureCause [1] ESMCause,

 3040 + initiator [2] Initiator,

 3041 + ePSSubscriberIDs [3] EPSSubscriberIDs,

 3042 + iMSIUnauthenticated [4] IMSIUnauthenticatedIndication OPTIONAL,

 3043 + failedProcedure [5] EPSPDNFailedProcedure

 3044 + }

 3045 +

 3046 +

3022 3047 PFDDataForApps ::= SET OF PFDDataForApp

3023 3048

3024 3049 PFDDataForApp ::= SEQUENCE

@@ -3209,6 +3234,13 @@ EPSPDNConnectionRequestType ::= ENUMERATED

3209 3234

3210 3235 EPSPDNConnectionReleaseScopeIndication ::= BOOLEAN

3211 3236

 3237 + EPSPDNFailedProcedure ::= CHOICE

 3238 + {

 3239 + ePSPDNConnectionEstablishment [1] EPSPDNConnectionEstablishment,

 3240 + ePSPDNConnectionModification [2] EPSPDNConnectionModification,

 3241 + ePSPDNConnectionRelease [3] EPSPDNConnectionRelease

 3242 + }

 3243 +

3212 3244 FiveGSInterworkingInfo ::= SEQUENCE

3213 3245 {

3214 3246 fiveGSInterworkingIndicator [1] FiveGSInterworkingIndicator,

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