**3GPP TSG-SA3 Meeting #85-LI-e *s3i220239r1***

**Online, , 25th Apr 2022 - 29th Apr 2022**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **33.128** | **CR** | **0352** | **rev** | **2** | **Current version:** | **17.4.0** |  |
|  | | | | | | | | |
| *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:*** | Edge Computing: LI stage 3 for Edge-unaware UE | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | SA3LI (Ministère Economie et Finances) | | | | | | | | | |
| ***Source to TSG:*** | SA3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | LI17 | | | | |  | ***Date:*** | | | 2022-04-24 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | POI of SMF don't provide xIRI events related to Edge Computing related to Edge unaware UE. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Extra IRI events on Edge Computing such those related to traffic influence or user plane path related to Edge unaware UE, are added to the IRI-POI of SMF. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Regulatory issue with CSPs to provide LI on target using their Edge Computing with Edge-unaware UE to LEMF in 5GC | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2; 3.3; 6.2.3.2Annex A | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | | Schema changes for this CR can be found on the Forge:  Merge Request: https://forge.3gpp.org/rep/sa3/li/-/merge\_requests/42  Commit Hash: https://forge.3gpp.org/rep/sa3/li/-/commit/efc699b71ec4049ba3dc0e378f5c3e3847f91416 | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | s3i220236 | | | | | | | | |

#### \*\*\* First Change \*\*\*

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.501: "System Architecture for the 5G System".

[3] 3GPP TS 33.126: "Lawful Interception Requirements".

[4] 3GPP TS 23.502: "Procedures for the 5G System; Stage 2".

[5] 3GPP TS 33.127: "Lawful Interception (LI) Architecture and Functions".

[6] ETSI TS 103 120: "Lawful Interception (LI); Interface for warrant information".

[7] ETSI TS 103 221-1: "Lawful Interception (LI); Internal Network Interfaces; Part 1: X1".

[8] ETSI TS 103 221-2: "Lawful Interception (LI); Internal Network Interfaces; Part 2: X2/X3".

[9] ETSI TS 102 232-1: "Lawful Interception (LI); Handover Interface and Service-Specific Details (SSD) for IP delivery; Part 1: Handover specification for IP delivery".

[10] ETSI TS 102 232-7: "Lawful Interception (LI); Handover Interface and Service-Specific Details (SSD) for IP delivery; Part 7: Service-specific details for Mobile Services".

[11] 3GPP TS 33.501: "Security Architecture and Procedures for the 5G System".

[12] 3GPP TS 33.108: "3G security; Handover interface for Lawful Interception (LI)".

[13] 3GPP TS 24.501: "Non-Access-Stratum (NAS) protocol for 5G System (5GS)".

[14] 3GPP TS 24.007: "Mobile radio interface signalling layer 3; General Aspects".

[15] 3GPP TS 29.244: "Interface between the Control Plane and the User Plane nodes".

[16] 3GPP TS 29.502: "5G System; Session Management Services; Stage 3".

[17] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".

[18] 3GPP TS 23.040: "Technical realization of the Short Message Service (SMS)".

[19] 3GPP TS 23.003: "Numbering, addressing and identification ".

[20] OMA-TS-MLP-V3\_5-20181211-C: "Open Mobile Alliance; Mobile Location Protocol, Candidate Version 3.5", <https://www.openmobilealliance.org/release/MLS/V1_4-20181211-C/OMA-TS-MLP-V3_5-20181211-C.pdf>.

[21] 3GPP TS 29.540: "5G System; SMS Services; Stage 3".

[22] 3GPP TS 29.518: "5G System; Access and Mobility Management Services; Stage 3".

[23] 3GPP TS 38.413: "NG Application Protocol (NGAP)".

[24] 3GPP TS 29.572: "Location Management Services; Stage 3".

[25] 3GPP TS 29.503: "5G System; Unified Data Management Services".

[26] IETF RFC 815: "IP datagram reassembly algorithms".

[27] IETF RFC 2460: "Internet Protocol, Version 6 (IPv6) Specification".

[28] IETF RFC 793: "Transmission Control Protocol".

[29] IETF RFC 768: "User Datagram Protocol".

[30] IETF RFC 4340: "Datagram Congestion Control Protocol (DCCP)".

[31] IETF RFC 4960: "Stream Control Transmission Protocol".

[32] IANA (www.iana.org): Assigned Internet Protocol Numbers, "Protocol Numbers".

[33] IETF RFC 6437: "IPv6 Flow Label Specification".

[34] IETF RFC 791: "Internet Protocol".

[35] Open Geospatial Consortium OGC 05-010: "URNs of definitions in ogc namespace".

[36] 3GPP TS 33.107: "3G security; Lawful interception architecture and functions".

[37] 3GPP TS 37.340: "Evolved Universal Radio Access (E-UTRA) and NR-Multi-connectivity; Stage 2".

[38] 3GPP TS 36.413: "S1 Application Protocol (S1AP)".

[39] OMA-TS-MMS\_ENC-V1\_3-20110913-A: "Multimedia Messaging Service Encapsulation Protocol".

[40] 3GPP TS 23.140: "Multimedia Messaging Protocol. Functional Description. Stage 2".

[41] 3GPP TS 38.415: "NG-RAN; PDU Session User Plane Protocol".

[42] 3GPP TS 23.273: "5G System (5GS) Location Services (LCS); Stage 2".

[43] IETF RFC 4566: "SDP: Session Description Protocol".

[44] 3GPP TS 24.193: "Stage 3: Access Traffic Steering, Switching and Splitting (ATSSS)".

[45] 3GPP TS 29.509: "5G System; Authentication Server Services; Stage 3".

[46] 3GPP TS 24.011: "Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface".

[47] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[48] 3GPP TS 29.504: "5G System; Unified Data Repository Services; Stage 3".

[49] 3GPP TS 29.505: "5G System; Usage of the Unified Data Repository services for Subscription Data; Stage 3".

[50] 3GPP TS 23.401 "General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access".

[51] 3GPP TS 24.301 "Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS), Stage 3".

[52] 3GPP TS 23.271 "Functional stage 2 description of Location Services (LCS)".

[53] 3GPP TS 29.172 "Evolved Packet Core (EPC) LCS Protocol (ELP) between the Gateway Mobile Location Centre (GMLC) and the Mobile Management Entity (MME); SLg interface".

[54] 3GPP TS 29.171 "LCS Application Protocol (LCS-AP) between the Mobile Management Entity (MME) and Evolved Serving Mobile Location Centre (E-SMLC); SLs interface".

[55] 3GPP TS 24.379: "Mission Critical Push to Talk (MCPTT) call control; protocol specification".

[56] OMA-TS-PoC-System\_Description-V2\_1-20110802-A: "OMA PoC System Description".

[57] 3GPP TS 29.541: "5G System; Network Exposure (NE) function services for Non-IP Data Delivery (NIDD); Stage 3".

[58] 3GPP TS 29.522: "5G System; Network Exposure Function Northbound APIs; Stage 3".

[59] 3GPP TS 29.338: "Diameter based protocols to support Short Message Service (SMS) capable Mobile Management Entities (MMEs); Stage 3".

[60] 3GPP TS 29.337: "Diameter-based T4 interface for communications with packet data networks and applications".

[61] 3GPP TS 24.250: "Protocol for Reliable Data Service; Stage 3".

[62] 3GPP TS 29.128: "Mobility Management Entity (MME) and Serving GPRS Support Node (SGSN) interfaces for interworking with packet data networks and applications".

[63] 3GPP TS 29.122: "T8 reference point for Northbound APIs".

[64] 3GPP TS 29.598: "5G System; Unstructured Data Storage Services; Stage3".

[65] 3GPP TS 33.535: "Authentication and Key Management for Applications (AKMA) based on 3GPP credentials in the 5G System (5GS)".

[66] IETF RFC 5246: "The Transport Layer Security (TLS) Protocol Version 1.2".

[67] GSMA IR.88: "IR.88 LTE and EPC Roaming Guidelines".

[68] GSMA NG.114 "IMS Profile for Voice, Video and Messaging over 5GS".

[69] IETF RFC 8225: "PASSporT: Personal Assertion Token".

[70] IETF RFC 8224: "Authenticated Identity Management in the Session Initiation Protocol (SIP)".

[71] IETF RFC 8588: "Personal Assertion Token (PaSSporT) Extension for Signature-based Handling of Asserted information using toKENs (SHAKEN)".

[72] 3GPP TS 24.196: "Enhanced Calling Name (eCNAM)".

[73] IETF draft-ietf-stir-passport-rcd-12: "PASSporT Extension for Rich Call Data".

NOTE: The above document cannot be formally referenced until it is published as an RFC.

[74] 3GPP TS 24.229: "IP multimedia call control protocol based on Session Initiation Protocol (SIP)and Session Description Protocol (SDP); Stage 3".

[75] IANA Session Initiation Protocol (SIP) Parameters: <https://www.iana.org/assignments/sip-parameters/sip-parameters.xhtml>

[76] IETF RFC 8946: "Personal Assertion Token (PASSporT) Extension for Diverted Calls".

[77] 3GPP TS 23.204: "3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Support of Short Message Service (SMS) over generic 3GPP Internet Protocol (IP) access; Stage 2".

[78] GSMA RCC.07: "Rich Communication Suite – Advanced Communications Services and Client Specification".

[79] IETF RFC 4975: "The Message Session Relay Protocol (MSRP)".

[80] IETF RFC 3862: "Common Presence and Instant Messaging (CPIM): Message Format".

[81] IETF RFC 5438: "Instant Message Disposition Notification (IMDN)".

[82] OMA-TS-CPM\_System\_Description-V2\_2-20170926-C: "OMA Converged IP Messaging System Description".

[83] IETF RFC 4566: "SDP: Session Description Protocol".

[84] 3GPP TS 36.455: "Evolved Universal Terrestrial Radio Access (E-UTRA); LTE Positioning Protocol A (LPPa) ".

[85] 3GPP TS 37.355: "LTE Positioning Protocol (LPP) ".

[86] 3GPP TS 38.455: "NG-RAN; NR Positioning Protocol A (NRPPa)".

[XX] 3GPP TS 29.513: "5G System; Policy and Charging Control signalling flows and QoS parameter mapping".

[YY] 3GPP TS 29.512: "5G System; Session Management Policy Control Service; Stage 3".

[ZZ] 3GPP TS 29.508: "5G System; Session Management Event Exposure Service; Stage 3".

#### \*\*\* End of First Change \*\*\*

#### \*\*\* Second Change \*\*\*

## 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

ADMF LI Administration Function

CC Content of Communication

CSP Communication Service Provider

CUPS Control and User Plane Separation

DNAI Data Network Access Identifier

ICF Identifier Caching Function

IEF Identifier Event Function

IQF Identifier Query Function

IRI Intercept Related Information

LALS Lawful Access Location Services

LEA Law Enforcement Agency

LEMF Law Enforcement Monitoring Facility

LI Lawful Interception

LICF Lawful Interception Control Function

LI\_HI1 LI\_Handover Interface 1

LI\_HI2 LI\_Handover Interface 2

LI\_HI3 LI\_Handover Interface 3

LI\_HI4 LI\_Handover Interface 4

LI\_HIQR Lawful Interception Handover Interface Query Response

LIPF Lawful Interception Provisioning Function

LIR Location Immediate Request

LI\_SI Lawful Interception System Information Interface

LISSF Lawful Interception State Storage Function

LI\_ST Lawful Interception State Transfer Interface

LI\_X1 Lawful Interception Internal Interface 1

LI\_X2 Lawful Interception Internal Interface 2

LI\_X3 Lawful Interception Internal Interface 3

LI\_XEM1 Lawful Interception Internal Interface Event Management Interface 1

LI\_XER Lawful Interception Internal Interface Event Record

LI\_XQR Lawful Interception Internal Interface Query Response

LTF Location Triggering Function

MDF Mediation and Delivery Function

MDF2 Mediation and Delivery Function 2

MDF3 Mediation and Delivery Function 3

MM Multimedia Message

MMS Multimedia Message Service

NPLI Network Provided Location Information

O&M Operations and Management

POI Point Of Interception

RCS Rich Communication Suite

SDP Session Description Protocol

SIP Session Initiation Protocol

SIRF System Information Retrieval Function

SOI Start Of Interception

TF Triggering Function

TNGF Trusted Non-3GPP Gateway Function

TWIF Trusted WLAN Interworking Function

xCC LI\_X3 Communications Content.

xIRI LI\_X2 Intercept Related Information

#### \*\*\* End of Second Change \*\*\*

#### \*\*\* Third Change \*\*\*

#### 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. 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.

##### 6.2.3.2.2 PDU session establishment

The IRI-POI in the SMF, or in the case of interworking, the IRI-POI in the SMF+PGW-C, shall generate an xIRI containing an SMFPDUSessionEstablishment record when the IRI-POI present in the SMF detects that a PDU session has been established for the target UE. The IRI-POI present in the SMF shall generate the xIRI for the following events:

- For a non-roaming scenario, the SMF (or for a roaming scenario, V-SMF in the VPLMN), sends the N1 NAS message (via AMF) PDU SESSION ESTABLISHMENT ACCEPT to the UE and the 5G Session Management (5GSM) state within the SMF is changed to PDU SESSION ACTIVE (see TS 24.501 [13]).

- For a home-routed roaming scenario, the SMF in the HPLMN (i.e. H-SMF) sends the N16: Nsmf\_PDU\_Session\_Create response message with n1SmInfoToUe IE containing the PDU SESSION ESTABLISHMENT ACCEPT (see TS 29.502 [16]).

Table 6.2.3-1: Payload for SMFPDUSessionEstablishment record

|  |  |  |
| --- | --- | --- |
| Field name | Description | M/C/O |
| sUPI | 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 | 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 associated with the PDU session if available (see NOTE). | C |
| gPSI | GPSI associated with the PDU session if available (see NOTE). | C |
| pDUSessionID | PDU Session ID See TS 24.501 [13] clause 9.4. | M |
| gTPTunnelID | 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 |
| pDUSessionType | Identifies selected PDU session type, see TS 24.501 [13] clause 9.11.4.11. | M |
| sNSSAI | 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 | UE endpoint address(es) if available. | C |
| non3GPPAccessEndpoint | 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 information provided by the AMF, if available.  Encoded as a *userLocation* parameter (*location>locationInfo>userLocation*), see Annex A. | C |
| dNN | 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. Shall be given in dotted-label presentation format as described in TS 23.003 [19] clause 9.1. | M |
| aMFID | Identifier of the AMF associated with the target UE, as defined in TS 23.003 [19] clause 2.10.1 if available. | C |
| hSMFURI | 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 | Type of request as described in TS 24.501 [13] clause 9.11.3.47 if available. 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. | C |
| accessType | 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 | 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 | Contents of the SM PDU DN Request container, if available, as described in TS 24.501 [13] clause 9.11.4.15. | C |
| uEEPSPDNConnection | 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 | Provides detailed information about PDN Connections. 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 |
| NOTE: At least one of the SUPI, PEI or GPSI fields shall be present. | | |

Table 6.2.3-1A: Payload for ePS5GSComboInfo

|  |  |  |
| --- | --- | --- |
| ePSInterworkingIndication | Indication that the AMF has selected a SMF+PGW-C to serve the PDU session. See TS 29.502 [16] clause 6.1.6.3.11. | M |
| ePSSubscriberIDs | Includes the Subscriber Identities associated with the EPS PDN Connection in the UE Context sent from the MME to the AMF. See TS 29.274 clause 7.2.1 and TS 23.502 [4] clause 4.11.1. | M |
| ePSPdnCnxInfo | Indicates that the PDU Session may be moved to EPS During its lifetime. See TS 29.502 [16] clause 6.1.6.2.31. | C |
| ePSBearerInfo | Includes the EPS Bearer context(s) successfully setup in EPS for the PDU Session. See TS 29.502 [16] clause 6.1.6.2.4. | C |

##### 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 PDU session has been modified for the target UE. The IRI-POI present in the SMF shall generate the xIRI for the following events:

- For a non-roaming scenario, the SMF (or for a roaming scenario, V-SMF in the VPLMN), receives the N1 NAS message (via AMF) PDU SESSION MODIFICATION COMMAND COMPLETE from the UE and the 5GSM state within the SMF is returned to PDU SESSION ACTIVE (see TS 24.501 [13]). This applies to the following two cases:

- UE initiated PDU session modification.

- Network (VPLMN) initiated PDU session modification.

- For a non-roaming scenario, the SMF (or for a roaming scenario, V-SMF in the VPLMN), sends the N1 NAS message (via AMF) PDU SESSION ESTABLISHMENT ACCEPT to the UE and the 5GSM state within the SMF remains in the PDU SESSION ACTIVE (see TS 24.501 [13]). This applies to the following case:

- Handover from one access type to another access type happens (e.g. 3GPP to non-3GPP).

- For a home-routed roaming scenario, the SMF in the HPLMN (i.e. H-SMF) receives the N16: Nsmf\_PDU\_Session\_Update response message with n1SmInfoFromUe IE containing the PDU SESSION MODIFICATION COMMAND COMPLETE (see TS 29.502 [16]). This applies to the following three cases:

- UE initiated PDU session modification.

- Network (VPLMN) initiated PDU session modification.

- Network (HPLMN) initiated PDU session modification.

- For a home-routed roaming scenario, the SMF in the HPLMN (i.e. H-SMF) sends the N16: Nsmf\_PDU\_Session\_Create response message with n1SmInfoToUe IE containing the PDU SESSION ESTABLISHMENT ACCEPT (see TS 29.502 [16]) while it had received a N16 Nsmf\_PDU\_Session\_Create request message with an existing PDU Session Id with access type being changed. This applies to the following case:

- Handover from one access type to another access type happens (e.g. 3GPP to non-3GPP).

- For a non-roaming scenario, SMF receives a Npcf\_SMPolicyControl\_Create response from the PCF for the target UE in response to Npcf\_SMPolicyControl\_Create request sent by SMF to PCF including PCC rules which traffic control policy data contains either a routeToLocs IE or steerModeDl and steerModeDI IEs. This corresponds to policies that influence the target UE’s traffic flows which are enabled at the SMF using the procedures described in TS 29.513 [XX] clause 5.5.3. Since several traffic influence policies may be associated to a PDU session, the xIRI is generated for each such PCC rule being created (see TS 29.512 [YY] clause 4.2). The xIRI contains an SMFPDUSessionModification record rather than SMFPDUSessionInitiation record because several policies may need to be reported.

- 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 steerModeDl and steerModeDI IEs. This corresponds to policy that influences the target UE’s traffic flow which is enabled or updated at the SMF using the procedures described in TS 29.513 [XX] clause 5.5.3. The xIRI is generated for each such PCC rule being created or updated.

- For a non-roaming scenario, SMF sends a Nsmf\_EventExposure\_Notify request to the NEF or AF for the target UE for the event "UP Path Change" related to a corresponding subscription from AF (see TS 29.508 [ZZ] clause 4.2.2).

- For a non-roaming scenario, SMF sends a Nsmf\_EventExposure\_AppRelocationInfo response to the NEF or AF for the target UE in response to Nsmf\_EventExposure\_AppRelocationInfo request sent by NEF or AF to SMF (see TS 29.508 [ZZ] clause 4.2.5).

Table 6.2.3-2: Payload for SMFPDUSessionModification record

|  |  |  |
| --- | --- | --- |
| Field name | Description | M/C/O |
| sUPI | 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 | 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 associated with the PDU session if available. | C |
| gPSI | GPSI associated with the PDU session if available. | C |
| sNSSAI | 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 | 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 information provided by the AMF, if available.  Encoded as a *userLocation* parameter (*location>locationInfo>userLocation*), see Annex A. | C |
| requestType | Type of request as described in TS 24.501 [13] clause 9.11.3.47 if available. | C |
| accessType | 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 | RAT type associated with the access, if available. Values given as per TS 29.571 [17] clause 5.4.3.2. | C |
| pDUSessionID | PDU Session ID See TS 24.501 [13] clause 9.4. This parameter is conditional only for backwards compatibility. | C |
| ePS5GSComboInfo | Provides detailed information about PDN Connections. 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, when available. | C |
| pCCRuleID | Policy rule identifier | C |
| appId | Identifies an application (NOTE 1) | C |
| flowInfos | A set of flow information. A flow information is an Ethernet or IP flow packet filter information (NOTE 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. | 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. | 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. | C |
| trafficRoutes | A set of traffic routes. A traffic route provides information to route to/from a DNAI. | C |
| steerModeDl | Traffic steering policy for downlink traffic at the SMF. | C |
| steerModeUl | Traffic steering policy for uplink traffic at the SMF. | C |
| sourceDNAI | Source DNAI, if the DNAI has changed. DNAI represents the location of applications towards which the traffic routing should apply | C |
| targetDNAI | Target DNAI if the DNAI has changed. | C |
| dNAIChangeType | Type of a DNAI change. Possible values are "early", "late" and "earlyAndLate" notification of UP path reconfiguration. | C |
| sourceUEIPAddress | The IPv4 Address of the served UE for the source DNAI. | C |
| targetUEIPAddress | The IPv4 Address of the served UE for the target DNAI. | C |
| sourceTrafficRouting | N6 traffic routing information for the source DNAI. | C |
| targetTrafficRouting | N6 traffic routing information for the target DNAI. | C |
| eASIPReplaceInfos | Transport addresses of the source and target Edge Application Servers | C |
| NOTE 1 : Either appId or flowInfos may be present. | | |

##### 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 PDU session has been released. The IRI-POI present in the SMF shall generate the xIRI for the following events:

- For a non-roaming scenario, the SMF (or for a roaming scenario, V-SMF in the VPLMN), receives the N1 NAS message (via AMF) PDU SESSION RELEASE COMMAND COMPLETE from the UE and the 5GSM state within the SMF is changed to PDU SESSION INACTIVE (see TS 24.501 [13]). This applies to the following two cases:

- UE initiated PDU session release.

- Network initiated PDU session release.

- For a non-roaming scenario, the SMF (or for a roaming scenario, V-SMF in the VPLMN), receives the N1 NAS message (via AMF) PDU SESSION MODIFICATION COMMAND REJECT from the UE with the cause value #43 indicating an invalid PDU Session ID and the 5GSM state within the SMF is changed to PDU SESSION INACTIVE (see TS 24.501 [13]). This applies to the case where the UE rejects a PDU SESSION MODIFICATION COMMAND as it finds that the indicated PDU session ID is invalid. The 5GSM state is changed to PDU SESSION INACTIVE within the SMF.

- For a home-routed roaming scenario, the SMF in the HPLMN (i.e. H-SMF) receives the N16: Nsmf\_PDU\_Session\_Update response message with n1SmInfoFromUe IE containing the PDU SESSION RELEASE COMMAND COMPLETE (see TS 29.502 [16]) from the V-SMF. This applies to the following three cases:

- UE initiated PDU session release.

- Network (VPLMN) initiated PDU session release.

- Network (HPLMN) initiated PDU session release.

- For a home-routed roaming scenario, the SMF in the HPLMN (i.e. H-SMF) receives the N16: Nsmf\_PDU\_Session\_Update response message with n1SmInfoFromUe IE containing the PDU SESSION MODIFICATION COMMAND REJECT (see TS 29.502 [16]) from the V-SMF with the cause value #43 indicating an Invalid PDU Session ID.

Table 6.2.3-3: Payload for SMFPDUSessionRelease record

|  |  |  |
| --- | --- | --- |
| Field name | Description | M/C/O |
| sUPI | SUPI associated with the PDU session. | M |
| pEI | PEI associated with the PDU session if available. | C |
| gPSI | GPSI associated with the PDU session if available. | C |
| pDUSessionID | PDU Session ID as assigned by the AMF. | M |
| timeOfFirstPacket | Time of first packet for the PDU session. | C |
| timeOfLastPacket | Time of last packet for the PDU session. | C |
| uplinkVolume | Number of uplink octets for the PDU session. | C |
| downlinkVolume | Number of downlink octets for the PDU session. | C |
| location | Location information, if available.  Encoded as a *userLocation* parameter (*location>locationInfo>userLocation*), see Annex A. | C |
| cause | 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 | Provides detailed information about PDN Connections. 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, when available. | 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 PDU session has already been established for the target UE when interception starts.

In a non-roaming scenario, the IRI-POI in the SMF (or in a roaming scenario, the IRI-POI in the V-SMF in the VPLMN) shall generate the xIRI containing the SMFStartOfInterceptionWithEstablishedPDUSession record when it detects that a new interception for a UE is activated (i.e. provisioned by the LIPF) for the following case:

- The 5GSM state within the SMF for that UE is 5GSM: PDU SESSION ACTIVE or PDU SESSION MODIFICATION PENDING.

NOTE: The above trigger happens when the SMF (V-SMF in VPLMN) had not sent an N1 NAS message PDU SESSION RELEASE COMMAND to the UE for a PDU session and the SMF (V-SMF in the VPLMN) had previously sent an N1 NAS message PDU SESSION ESTABLISHMENT ACCEPT to that UE for the same PDU session.

In a home-routed roaming scenario, the IRI-POI in the H-SMF shall generate the xIRI containing the SMFStartOfInterceptionWithEstablishedPDUSession record when it detects that a new interception for a UE is activated (i.e. provisioned by the LIPF) for the following case:

- The H-SMF had not sent a Nsmf\_PDU\_Session\_Update Request (n1SmInfoToUe: PDU SESSION RELEASE COMMAND) to the V-SMF for a PDU session and H-SMF had previously sent a Nsmf\_PDU\_Session\_Create response (n1SmInfoToUE: PDU SESSION ESTABLISHMENT ACCEPT) to the V-SMF for that PDU session.

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 | Description | M/C/O |
| sUPI | 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 | 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 associated with the PDU session if available. | C |
| gPSI | GPSI associated with the PDU session if available. | C |
| pDUSessionID | PDU Session ID as assigned by the AMF, as defined in TS 24.007 [14] clause 11.2.3.1b. | M |
| gTPTunnelID | Contains the F-TEID identifying the 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 |
| pDUSessionType | Identifies selected PDU session type, see TS 24.501 [13] clause 9.11.4.11. | M |
| sNSSAI | 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 | 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. | C |
| non3GPPAccessEndpoint | 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 information provided by the AMF at session establishment, if available.  Encoded as a *userLocation* parameter (*location>locationInfo>userLocation*), see Annex A. | C |
| dNN | 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. Shall be given in dotted-label presentation format as described in TS 23.003 [19] clause 9.1. | M |
| aMFID | Identifier of the AMF associated with the target UE, as defined in TS 23.003 [19] clause 2.10.1, if available. | C |
| hSMFURI | 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 | Type of request as described in TS 24.501 [13] clause 9.11.3.47 if available. | C |
| accessType | 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 | 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 | Contents of the SM PDU DN request container, if available, as described in TS 24.501 [13] clause 9.11.4.15. | C |
| timeOfSessionEstablishment | 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 | Provides detailed information about PDN Connections. 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 |

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 | Description | M/C/O |
| failedProcedureType | Specifies the procedure which failed or is aborted at the SMF. | M |
| failureCause | 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 | 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 | Specifies whether the network (SMF) or the UE is initiating the rejection or indicating the failure. | M |
| sUPI | SUPI associated with the procedure, if available (see NOTE). | C |
| sUPIUnauthenticated | 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 used in the procedure, if available (see NOTE). | C |
| gPSI | GPSI used in the procedure, if available (see NOTE). | C |
| pDUSessionID | PDU Session ID See clause 9.4 of TS 24.501 [13], if available. | C | |
| uEEndpoint | UE endpoint address(es) if available. | C | |
| non3GPPAccessEndpoint | UE's local IP address used to reach the N3IWF, TNGF or TWIF, if available. | C | |
| location | Location information provided by the AMF, if available.  Encoded as a *userLocation* parameter (*location>locationInfo>userLocation*), see Annex A. | C | |
| dNN | 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 | Identifier of the AMF associated with the target UE, as defined in TS 23.003 [19] clause 2.10.1 when available. | C | |
| hSMFURI | 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 | Type of request as described in TS 24.501 [13] clause 9.11.3.47 if available. | C | |
| accessType | 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 | 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 | 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. | | | |

#### \*\*\* End of third Change \*\*\*

#### \*\*\* Fourth Change \*\*\*

TS33128Payloads

{itu-t(0) identified-organization(4) etsi(0) securityDomain(2) lawfulIntercept(2) threeGPP(4) ts33128(19) r17(17) version3(3)}

DEFINITIONS IMPLICIT TAGS EXTENSIBILITY IMPLIED ::=

BEGIN

-- =============

-- Relative OIDs

-- =============

tS33128PayloadsOID RELATIVE-OID ::= {threeGPP(4) ts33128(19) r17(17) version3(3)}

xIRIPayloadOID RELATIVE-OID ::= {tS33128PayloadsOID xIRI(1)}

xCCPayloadOID RELATIVE-OID ::= {tS33128PayloadsOID xCC(2)}

iRIPayloadOID RELATIVE-OID ::= {tS33128PayloadsOID iRI(3)}

cCPayloadOID RELATIVE-OID ::= {tS33128PayloadsOID cC(4)}

lINotificationPayloadOID RELATIVE-OID ::= {tS33128PayloadsOID lINotification(5)}

-- ===============

-- X2 xIRI payload

-- ===============

XIRIPayload ::= SEQUENCE

{

xIRIPayloadOID [1] RELATIVE-OID,

event [2] XIRIEvent

}

XIRIEvent ::= CHOICE

{

-- Access and mobility related events, see clause 6.2.2

registration [1] AMFRegistration,

deregistration [2] AMFDeregistration,

locationUpdate [3] AMFLocationUpdate,

startOfInterceptionWithRegisteredUE [4] AMFStartOfInterceptionWithRegisteredUE,

unsuccessfulAMProcedure [5] AMFUnsuccessfulProcedure,

-- PDU session-related events, see clause 6.2.3

pDUSessionEstablishment [6] SMFPDUSessionEstablishment,

pDUSessionModification [7] SMFPDUSessionModification,

pDUSessionRelease [8] SMFPDUSessionRelease,

startOfInterceptionWithEstablishedPDUSession [9] SMFStartOfInterceptionWithEstablishedPDUSession,

unsuccessfulSMProcedure [10] SMFUnsuccessfulProcedure,

-- Subscriber-management related events, see clause 7.2.2

servingSystemMessage [11] UDMServingSystemMessage,

-- SMS-related events, see clause 6.2.5, see also sMSReport ([56] below)

sMSMessage [12] SMSMessage,

-- LALS-related events, see clause 7.3.3

lALSReport [13] LALSReport,

-- PDHR/PDSR-related events, see clause 6.2.3.4.1

pDHeaderReport [14] PDHeaderReport,

pDSummaryReport [15] PDSummaryReport,

-- tag 16 is reserved because there is no equivalent mDFCellSiteReport in XIRIEvent

-- MMS-related events, see clause 7.4.2

mMSSend [17] MMSSend,

mMSSendByNonLocalTarget [18] MMSSendByNonLocalTarget,

mMSNotification [19] MMSNotification,

mMSSendToNonLocalTarget [20] MMSSendToNonLocalTarget,

mMSNotificationResponse [21] MMSNotificationResponse,

mMSRetrieval [22] MMSRetrieval,

mMSDeliveryAck [23] MMSDeliveryAck,

mMSForward [24] MMSForward,

mMSDeleteFromRelay [25] MMSDeleteFromRelay,

mMSDeliveryReport [26] MMSDeliveryReport,

mMSDeliveryReportNonLocalTarget [27] MMSDeliveryReportNonLocalTarget,

mMSReadReport [28] MMSReadReport,

mMSReadReportNonLocalTarget [29] MMSReadReportNonLocalTarget,

mMSCancel [30] MMSCancel,

mMSMBoxStore [31] MMSMBoxStore,

mMSMBoxUpload [32] MMSMBoxUpload,

mMSMBoxDelete [33] MMSMBoxDelete,

mMSMBoxViewRequest [34] MMSMBoxViewRequest,

mMSMBoxViewResponse [35] MMSMBoxViewResponse,

-- PTC-related events, see clause 7.5.2

pTCRegistration [36] PTCRegistration,

pTCSessionInitiation [37] PTCSessionInitiation,

pTCSessionAbandon [38] PTCSessionAbandon,

pTCSessionStart [39] PTCSessionStart,

pTCSessionEnd [40] PTCSessionEnd,

pTCStartOfInterception [41] PTCStartOfInterception,

pTCPreEstablishedSession [42] PTCPreEstablishedSession,

pTCInstantPersonalAlert [43] PTCInstantPersonalAlert,

pTCPartyJoin [44] PTCPartyJoin,

pTCPartyDrop [45] PTCPartyDrop,

pTCPartyHold [46] PTCPartyHold,

pTCMediaModification [47] PTCMediaModification,

pTCGroupAdvertisement [48] PTCGroupAdvertisement,

pTCFloorControl [49] PTCFloorControl,

pTCTargetPresence [50] PTCTargetPresence,

pTCParticipantPresence [51] PTCParticipantPresence,

pTCListManagement [52] PTCListManagement,

pTCAccessPolicy [53] PTCAccessPolicy,

-- More Subscriber-management related events, see clause 7.2.2

subscriberRecordChangeMessage [54] UDMSubscriberRecordChangeMessage,

cancelLocationMessage [55] UDMCancelLocationMessage,

-- SMS-related events continued from choice 12

sMSReport [56] SMSReport,

-- MA PDU session-related events, see clause 6.2.3.2.7

sMFMAPDUSessionEstablishment [57] SMFMAPDUSessionEstablishment,

sMFMAPDUSessionModification [58] SMFMAPDUSessionModification,

sMFMAPDUSessionRelease [59] SMFMAPDUSessionRelease,

startOfInterceptionWithEstablishedMAPDUSession [60] SMFStartOfInterceptionWithEstablishedMAPDUSession,

unsuccessfulMASMProcedure [61] SMFMAUnsuccessfulProcedure,

-- Identifier Association events, see clauses 6.2.2.2.7 and 6.3.2.2.2

aMFIdentifierAssociation [62] AMFIdentifierAssociation,

mMEIdentifierAssociation [63] MMEIdentifierAssociation,

-- PDU to MA PDU session-related events, see clause 6.2.3.2.8

sMFPDUtoMAPDUSessionModification [64] SMFPDUtoMAPDUSessionModification,

-- NEF services related events, see clause 7.7.2

nEFPDUSessionEstablishment [65] NEFPDUSessionEstablishment,

nEFPDUSessionModification [66] NEFPDUSessionModification,

nEFPDUSessionRelease [67] NEFPDUSessionRelease,

nEFUnsuccessfulProcedure [68] NEFUnsuccessfulProcedure,

nEFStartOfInterceptionWithEstablishedPDUSession [69] NEFStartOfInterceptionWithEstablishedPDUSession,

nEFdeviceTrigger [70] NEFDeviceTrigger,

nEFdeviceTriggerReplace [71] NEFDeviceTriggerReplace,

nEFdeviceTriggerCancellation [72] NEFDeviceTriggerCancellation,

nEFdeviceTriggerReportNotify [73] NEFDeviceTriggerReportNotify,

nEFMSISDNLessMOSMS [74] NEFMSISDNLessMOSMS,

nEFExpectedUEBehaviourUpdate [75] NEFExpectedUEBehaviourUpdate,

-- SCEF services related events, see clause 7.8.2

sCEFPDNConnectionEstablishment [76] SCEFPDNConnectionEstablishment,

sCEFPDNConnectionUpdate [77] SCEFPDNConnectionUpdate,

sCEFPDNConnectionRelease [78] SCEFPDNConnectionRelease,

sCEFUnsuccessfulProcedure [79] SCEFUnsuccessfulProcedure,

sCEFStartOfInterceptionWithEstablishedPDNConnection [80] SCEFStartOfInterceptionWithEstablishedPDNConnection,

sCEFdeviceTrigger [81] SCEFDeviceTrigger,

sCEFdeviceTriggerReplace [82] SCEFDeviceTriggerReplace,

sCEFdeviceTriggerCancellation [83] SCEFDeviceTriggerCancellation,

sCEFdeviceTriggerReportNotify [84] SCEFDeviceTriggerReportNotify,

sCEFMSISDNLessMOSMS [85] SCEFMSISDNLessMOSMS,

sCEFCommunicationPatternUpdate [86] SCEFCommunicationPatternUpdate,

-- EPS Events, see clause 6.3

-- MME Events, see clause 6.3.2.2

mMEAttach [87] MMEAttach,

mMEDetach [88] MMEDetach,

mMELocationUpdate [89] MMELocationUpdate,

mMEStartOfInterceptionWithEPSAttachedUE [90] MMEStartOfInterceptionWithEPSAttachedUE,

mMEUnsuccessfulProcedure [91] MMEUnsuccessfulProcedure,

-- AKMA key management events, see clause 7.9.1

aAnFAnchorKeyRegister [92] AAnFAnchorKeyRegister,

aAnFKAKMAApplicationKeyGet [93] AAnFKAKMAApplicationKeyGet,

aAnFStartOfInterceptWithEstablishedAKMAKeyMaterial [94] AAnFStartOfInterceptWithEstablishedAKMAKeyMaterial,

aAnFAKMAContextRemovalRecord [95] AAnFAKMAContextRemovalRecord,

aFAKMAApplicationKeyRefresh [96] AFAKMAApplicationKeyRefresh,

aFStartOfInterceptWithEstablishedAKMAApplicationKey [97] AFStartOfInterceptWithEstablishedAKMAApplicationKey,

aFAuxiliarySecurityParameterEstablishment [98] AFAuxiliarySecurityParameterEstablishment,

aFApplicationKeyRemoval [99] AFApplicationKeyRemoval,

-- HR LI Events, see clause 7.10.3.3

n9HRPDUSessionInfo [100] N9HRPDUSessionInfo,

s8HRBearerInfo [101] S8HRBearerInfo,

-- Separated Location Reporting, see clause 7.3.4

separatedLocationReporting [102] SeparatedLocationReporting,

-- STIR SHAKEN and RCD/eCNAM Events, see clause 7.11.2

sTIRSHAKENSignatureGeneration [103] STIRSHAKENSignatureGeneration,

sTIRSHAKENSignatureValidation [104] STIRSHAKENSignatureValidation,

-- IMS events, see clause 7.11.4.2

iMSMessage [105] IMSMessage,

startOfInterceptionForActiveIMSSession [106] StartOfInterceptionForActiveIMSSession,

iMSCCUnavailable [107] IMSCCUnavailable,

-- UDM events, see clause 7.2.2

uDMLocationInformationResult [108] UDMLocationInformationResult,

uDMUEInformationResponse [109] UDMUEInformationResponse,

uDMUEAuthenticationResponse [110] UDMUEAuthenticationResponse,

-- AMF events, see 6.2.2.2.8

positioningInfoTransfer [111] AMFPositioningInfoTransfer,

-- MME Events, see clause 6.3.2.2.8

mMEPositioningInfoTransfer [112] MMEPositioningInfoTransfer

}

-- ==============

-- X3 xCC payload

-- ==============

-- No additional xCC payload definitions required in the present document.

-- ===============

-- HI2 IRI payload

-- ===============

IRIPayload ::= SEQUENCE

{

iRIPayloadOID [1] RELATIVE-OID,

event [2] IRIEvent,

targetIdentifiers [3] SEQUENCE OF IRITargetIdentifier OPTIONAL

}

IRIEvent ::= CHOICE

{

-- Registration-related events, see clause 6.2.2

registration [1] AMFRegistration,

deregistration [2] AMFDeregistration,

locationUpdate [3] AMFLocationUpdate,

startOfInterceptionWithRegisteredUE [4] AMFStartOfInterceptionWithRegisteredUE,

unsuccessfulRegistrationProcedure [5] AMFUnsuccessfulProcedure,

-- PDU session-related events, see clause 6.2.3

pDUSessionEstablishment [6] SMFPDUSessionEstablishment,

pDUSessionModification [7] SMFPDUSessionModification,

pDUSessionRelease [8] SMFPDUSessionRelease,

startOfInterceptionWithEstablishedPDUSession [9] SMFStartOfInterceptionWithEstablishedPDUSession,

unsuccessfulSessionProcedure [10] SMFUnsuccessfulProcedure,

-- Subscriber-management related events, see clause 7.2.2

servingSystemMessage [11] UDMServingSystemMessage,

-- SMS-related events, see clause 6.2.5, see also sMSReport ([56] below)

sMSMessage [12] SMSMessage,

-- LALS-related events, see clause 7.3.3

lALSReport [13] LALSReport,

-- PDHR/PDSR-related events, see clause 6.2.3.4.1

pDHeaderReport [14] PDHeaderReport,

pDSummaryReport [15] PDSummaryReport,

-- MDF-related events, see clause 7.3.2

mDFCellSiteReport [16] MDFCellSiteReport,

-- MMS-related events, see clause 7.4.2

mMSSend [17] MMSSend,

mMSSendByNonLocalTarget [18] MMSSendByNonLocalTarget,

mMSNotification [19] MMSNotification,

mMSSendToNonLocalTarget [20] MMSSendToNonLocalTarget,

mMSNotificationResponse [21] MMSNotificationResponse,

mMSRetrieval [22] MMSRetrieval,

mMSDeliveryAck [23] MMSDeliveryAck,

mMSForward [24] MMSForward,

mMSDeleteFromRelay [25] MMSDeleteFromRelay,

mMSDeliveryReport [26] MMSDeliveryReport,

mMSDeliveryReportNonLocalTarget [27] MMSDeliveryReportNonLocalTarget,

mMSReadReport [28] MMSReadReport,

mMSReadReportNonLocalTarget [29] MMSReadReportNonLocalTarget,

mMSCancel [30] MMSCancel,

mMSMBoxStore [31] MMSMBoxStore,

mMSMBoxUpload [32] MMSMBoxUpload,

mMSMBoxDelete [33] MMSMBoxDelete,

mMSMBoxViewRequest [34] MMSMBoxViewRequest,

mMSMBoxViewResponse [35] MMSMBoxViewResponse,

-- PTC-related events, see clause 7.5.2

pTCRegistration [36] PTCRegistration,

pTCSessionInitiation [37] PTCSessionInitiation,

pTCSessionAbandon [38] PTCSessionAbandon,

pTCSessionStart [39] PTCSessionStart,

pTCSessionEnd [40] PTCSessionEnd,

pTCStartOfInterception [41] PTCStartOfInterception,

pTCPreEstablishedSession [42] PTCPreEstablishedSession,

pTCInstantPersonalAlert [43] PTCInstantPersonalAlert,

pTCPartyJoin [44] PTCPartyJoin,

pTCPartyDrop [45] PTCPartyDrop,

pTCPartyHold [46] PTCPartyHold,

pTCMediaModification [47] PTCMediaModification,

pTCGroupAdvertisement [48] PTCGroupAdvertisement,

pTCFloorControl [49] PTCFloorControl,

pTCTargetPresence [50] PTCTargetPresence,

pTCParticipantPresence [51] PTCParticipantPresence,

pTCListManagement [52] PTCListManagement,

pTCAccessPolicy [53] PTCAccessPolicy,

-- More Subscriber-management related events, see clause 7.2.2

subscriberRecordChangeMessage [54] UDMSubscriberRecordChangeMessage,

cancelLocationMessage [55] UDMCancelLocationMessage,

-- SMS-related events, continued from choice 12

sMSReport [56] SMSReport,

-- MA PDU session-related events, see clause 6.2.3.2.7

sMFMAPDUSessionEstablishment [57] SMFMAPDUSessionEstablishment,

sMFMAPDUSessionModification [58] SMFMAPDUSessionModification,

sMFMAPDUSessionRelease [59] SMFMAPDUSessionRelease,

startOfInterceptionWithEstablishedMAPDUSession [60] SMFStartOfInterceptionWithEstablishedMAPDUSession,

unsuccessfulMASMProcedure [61] SMFMAUnsuccessfulProcedure,

-- Identifier Association events, see clauses 6.2.2.2.7 and 6.3.2.2.2

aMFIdentifierAssociation [62] AMFIdentifierAssociation,

mMEIdentifierAssociation [63] MMEIdentifierAssociation,

-- PDU to MA PDU session-related events, see clause 6.2.3.2.8

sMFPDUtoMAPDUSessionModification [64] SMFPDUtoMAPDUSessionModification,

-- NEF services related events, see clause 7.7.2,

nEFPDUSessionEstablishment [65] NEFPDUSessionEstablishment,

nEFPDUSessionModification [66] NEFPDUSessionModification,

nEFPDUSessionRelease [67] NEFPDUSessionRelease,

nEFUnsuccessfulProcedure [68] NEFUnsuccessfulProcedure,

nEFStartOfInterceptionWithEstablishedPDUSession [69] NEFStartOfInterceptionWithEstablishedPDUSession,

nEFdeviceTrigger [70] NEFDeviceTrigger,

nEFdeviceTriggerReplace [71] NEFDeviceTriggerReplace,

nEFdeviceTriggerCancellation [72] NEFDeviceTriggerCancellation,

nEFdeviceTriggerReportNotify [73] NEFDeviceTriggerReportNotify,

nEFMSISDNLessMOSMS [74] NEFMSISDNLessMOSMS,

nEFExpectedUEBehaviourUpdate [75] NEFExpectedUEBehaviourUpdate,

-- SCEF services related events, see clause 7.8.2

sCEFPDNConnectionEstablishment [76] SCEFPDNConnectionEstablishment,

sCEFPDNConnectionUpdate [77] SCEFPDNConnectionUpdate,

sCEFPDNConnectionRelease [78] SCEFPDNConnectionRelease,

sCEFUnsuccessfulProcedure [79] SCEFUnsuccessfulProcedure,

sCEFStartOfInterceptionWithEstablishedPDNConnection [80] SCEFStartOfInterceptionWithEstablishedPDNConnection,

sCEFdeviceTrigger [81] SCEFDeviceTrigger,

sCEFdeviceTriggerReplace [82] SCEFDeviceTriggerReplace,

sCEFdeviceTriggerCancellation [83] SCEFDeviceTriggerCancellation,

sCEFdeviceTriggerReportNotify [84] SCEFDeviceTriggerReportNotify,

sCEFMSISDNLessMOSMS [85] SCEFMSISDNLessMOSMS,

sCEFCommunicationPatternUpdate [86] SCEFCommunicationPatternUpdate,

-- EPS Events, see clause 6.3

-- MME Events, see clause 6.3.2.2

mMEAttach [87] MMEAttach,

mMEDetach [88] MMEDetach,

mMELocationUpdate [89] MMELocationUpdate,

mMEStartOfInterceptionWithEPSAttachedUE [90] MMEStartOfInterceptionWithEPSAttachedUE,

mMEUnsuccessfulProcedure [91] MMEUnsuccessfulProcedure,

-- AKMA key management events, see clause 7.9.1

aAnFAnchorKeyRegister [92] AAnFAnchorKeyRegister,

aAnFKAKMAApplicationKeyGet [93] AAnFKAKMAApplicationKeyGet,

aAnFStartOfInterceptWithEstablishedAKMAKeyMaterial [94] AAnFStartOfInterceptWithEstablishedAKMAKeyMaterial,

aAnFAKMAContextRemovalRecord [95] AAnFAKMAContextRemovalRecord,

aFAKMAApplicationKeyRefresh [96] AFAKMAApplicationKeyRefresh,

aFStartOfInterceptWithEstablishedAKMAApplicationKey [97] AFStartOfInterceptWithEstablishedAKMAApplicationKey,

aFAuxiliarySecurityParameterEstablishment [98] AFAuxiliarySecurityParameterEstablishment,

aFApplicationKeyRemoval [99] AFApplicationKeyRemoval,

-- tag 100 is reserved because there is no equivalent n9HRPDUSessionInfo in IRIEvent.

-- tag 101 is reserved because there is no equivalent S8HRBearerInfo in IRIEvent.

-- Separated Location Reporting, see clause 7.3.4

separatedLocationReporting [102] SeparatedLocationReporting,

-- STIR SHAKEN and RCD/eCNAM Events, see clause 7.11.3

sTIRSHAKENSignatureGeneration [103] STIRSHAKENSignatureGeneration,

sTIRSHAKENSignatureValidation [104] STIRSHAKENSignatureValidation,

-- IMS events, see clause 7.11.4.2

iMSMessage [105] IMSMessage,

startOfInterceptionForActiveIMSSession [106] StartOfInterceptionForActiveIMSSession,

iMSCCUnavailable [107] IMSCCUnavailable,

-- UDM events, see clause 7.2.2

uDMLocationInformationResultRecord [108] UDMLocationInformationResult,

uDMUEInformationResponse [109] UDMUEInformationResponse,

uDMUEAuthenticationResponse [110] UDMUEAuthenticationResponse,

-- AMF events, see 6.2.2.2.8

positioningInfoTransfer [111] AMFPositioningInfoTransfer,

-- MME Events, see clause 6.3.2.2.8

mMEPositioningInfoTransfer [112] MMEPositioningInfoTransfer

}

IRITargetIdentifier ::= SEQUENCE

{

identifier [1] TargetIdentifier,

provenance [2] TargetIdentifierProvenance OPTIONAL

}

-- ==============

-- HI3 CC payload

-- ==============

CCPayload ::= SEQUENCE

{

cCPayloadOID [1] RELATIVE-OID,

pDU [2] CCPDU

}

CCPDU ::= CHOICE

{

uPFCCPDU [1] UPFCCPDU,

extendedUPFCCPDU [2] ExtendedUPFCCPDU,

mMSCCPDU [3] MMSCCPDU,

nIDDCCPDU [4] NIDDCCPDU,

pTCCCPDU [5] PTCCCPDU

}

-- ===========================

-- HI4 LI notification payload

-- ===========================

LINotificationPayload ::= SEQUENCE

{

lINotificationPayloadOID [1] RELATIVE-OID,

notification [2] LINotificationMessage

}

LINotificationMessage ::= CHOICE

{

lINotification [1] LINotification

}

-- =================

-- HR LI definitions

-- =================

N9HRPDUSessionInfo ::= SEQUENCE

{

sUPI [1] SUPI,

pEI [2] PEI OPTIONAL,

pDUSessionID [3] PDUSessionID,

location [4] Location OPTIONAL,

sNSSAI [5] SNSSAI OPTIONAL,

dNN [6] DNN OPTIONAL,

messageCause [7] N9HRMessageCause

}

S8HRBearerInfo ::= SEQUENCE

{

iMSI [1] IMSI,

iMEI [2] IMEI OPTIONAL,

bearerID [3] EPSBearerID,

linkedBearerID [4] EPSBearerID OPTIONAL,

location [5] Location OPTIONAL,

aPN [6] APN OPTIONAL,

sGWIPAddress [7] IPAddress OPTIONAL,

messageCause [8] S8HRMessageCause

}

-- ================

-- HR LI parameters

-- ================

N9HRMessageCause ::= ENUMERATED

{

pDUSessionEstablished(1),

pDUSessionModified(2),

pDUSessionReleased(3),

updatedLocationAvailable(4),

sMFChanged(5),

other(6),

hRLIEnabled(7)

}

S8HRMessageCause ::= ENUMERATED

{

bearerActivated(1),

bearerModified(2),

bearerDeleted(3),

pDNDisconnected(4),

updatedLocationAvailable(5),

sGWChanged(6),

other(7),

hRLIEnabled(8)

}

-- ==================

-- 5G NEF definitions

-- ==================

-- See clause 7.7.2.1.2 for details of this structure

NEFPDUSessionEstablishment ::= SEQUENCE

{

sUPI [1] SUPI,

gPSI [2] GPSI,

pDUSessionID [3] PDUSessionID,

sNSSAI [4] SNSSAI,

nEFID [5] NEFID,

dNN [6] DNN,

rDSSupport [7] RDSSupport,

sMFID [8] SMFID,

aFID [9] AFID

}

-- See clause 7.7.2.1.3 for details of this structure

NEFPDUSessionModification ::= SEQUENCE

{

sUPI [1] SUPI,

gPSI [2] GPSI,

sNSSAI [3] SNSSAI,

initiator [4] Initiator,

rDSSourcePortNumber [5] RDSPortNumber OPTIONAL,

rDSDestinationPortNumber [6] RDSPortNumber OPTIONAL,

applicationID [7] ApplicationID OPTIONAL,

aFID [8] AFID OPTIONAL,

rDSAction [9] RDSAction OPTIONAL,

serializationFormat [10] SerializationFormat OPTIONAL

}

-- See clause 7.7.2.1.4 for details of this structure

NEFPDUSessionRelease ::= SEQUENCE

{

sUPI [1] SUPI,

gPSI [2] GPSI,

pDUSessionID [3] PDUSessionID,

timeOfFirstPacket [4] Timestamp OPTIONAL,

timeOfLastPacket [5] Timestamp OPTIONAL,

uplinkVolume [6] INTEGER OPTIONAL,

downlinkVolume [7] INTEGER OPTIONAL,

releaseCause [8] NEFReleaseCause

}

-- See clause 7.7.2.1.5 for details of this structure

NEFUnsuccessfulProcedure ::= SEQUENCE

{

failureCause [1] NEFFailureCause,

sUPI [2] SUPI,

gPSI [3] GPSI OPTIONAL,

pDUSessionID [4] PDUSessionID,

dNN [5] DNN OPTIONAL,

sNSSAI [6] SNSSAI OPTIONAL,

rDSDestinationPortNumber [7] RDSPortNumber,

applicationID [8] ApplicationID,

aFID [9] AFID

}

-- See clause 7.7.2.1.6 for details of this structure

NEFStartOfInterceptionWithEstablishedPDUSession ::= SEQUENCE

{

sUPI [1] SUPI,

gPSI [2] GPSI,

pDUSessionID [3] PDUSessionID,

dNN [4] DNN,

sNSSAI [5] SNSSAI,

nEFID [6] NEFID,

rDSSupport [7] RDSSupport,

sMFID [8] SMFID,

aFID [9] AFID

}

-- See clause 7.7.3.1.1 for details of this structure

NEFDeviceTrigger ::= SEQUENCE

{

sUPI [1] SUPI,

gPSI [2] GPSI,

triggerId [3] TriggerID,

aFID [4] AFID,

triggerPayload [5] TriggerPayload OPTIONAL,

validityPeriod [6] INTEGER OPTIONAL,

priorityDT [7] PriorityDT OPTIONAL,

sourcePortId [8] PortNumber OPTIONAL,

destinationPortId [9] PortNumber OPTIONAL

}

-- See clause 7.7.3.1.2 for details of this structure

NEFDeviceTriggerReplace ::= SEQUENCE

{

sUPI [1] SUPI,

gPSI [2] GPSI,

triggerId [3] TriggerID,

aFID [4] AFID,

triggerPayload [5] TriggerPayload OPTIONAL,

validityPeriod [6] INTEGER OPTIONAL,

priorityDT [7] PriorityDT OPTIONAL,

sourcePortId [8] PortNumber OPTIONAL,

destinationPortId [9] PortNumber OPTIONAL

}

-- See clause 7.7.3.1.3 for details of this structure

NEFDeviceTriggerCancellation ::= SEQUENCE

{

sUPI [1] SUPI,

gPSI [2] GPSI,

triggerId [3] TriggerID

}

-- See clause 7.7.3.1.4 for details of this structure

NEFDeviceTriggerReportNotify ::= SEQUENCE

{

sUPI [1] SUPI,

gPSI [2] GPSI,

triggerId [3] TriggerID,

deviceTriggerDeliveryResult [4] DeviceTriggerDeliveryResult

}

-- See clause 7.7.4.1.1 for details of this structure

NEFMSISDNLessMOSMS ::= SEQUENCE

{

sUPI [1] SUPI,

gPSI [2] GPSI,

terminatingSMSParty [3] AFID,

sMS [4] SMSTPDUData OPTIONAL,

sourcePort [5] PortNumber OPTIONAL,

destinationPort [6] PortNumber OPTIONAL

}

-- See clause 7.7.5.1.1 for details of this structure

NEFExpectedUEBehaviourUpdate ::= SEQUENCE

{

gPSI [1] GPSI,

expectedUEMovingTrajectory [2] SEQUENCE OF UMTLocationArea5G OPTIONAL,

stationaryIndication [3] StationaryIndication OPTIONAL,

communicationDurationTime [4] INTEGER OPTIONAL,

periodicTime [5] INTEGER OPTIONAL,

scheduledCommunicationTime [6] ScheduledCommunicationTime OPTIONAL,

scheduledCommunicationType [7] ScheduledCommunicationType OPTIONAL,

batteryIndication [8] BatteryIndication OPTIONAL,

trafficProfile [9] TrafficProfile OPTIONAL,

expectedTimeAndDayOfWeekInTrajectory [10] SEQUENCE OF UMTLocationArea5G OPTIONAL,

aFID [11] AFID,

validityTime [12] Timestamp OPTIONAL

}

-- ==========================

-- Common SCEF/NEF parameters

-- ==========================

RDSSupport ::= BOOLEAN

RDSPortNumber ::= INTEGER (0..15)

RDSAction ::= ENUMERATED

{

reservePort(1),

releasePort(2)

}

SerializationFormat ::= ENUMERATED

{

xml(1),

json(2),

cbor(3)

}

ApplicationID ::= OCTET STRING

NIDDCCPDU ::= OCTET STRING

TriggerID ::= UTF8String

PriorityDT ::= ENUMERATED

{

noPriority(1),

priority(2)

}

TriggerPayload ::= OCTET STRING

DeviceTriggerDeliveryResult ::= ENUMERATED

{

success(1),

unknown(2),

failure(3),

triggered(4),

expired(5),

unconfirmed(6),

replaced(7),

terminate(8)

}

StationaryIndication ::= ENUMERATED

{

stationary(1),

mobile(2)

}

BatteryIndication ::= ENUMERATED

{

batteryRecharge(1),

batteryReplace(2),

batteryNoRecharge(3),

batteryNoReplace(4),

noBattery(5)

}

ScheduledCommunicationTime ::= SEQUENCE

{

days [1] SEQUENCE OF Daytime

}

UMTLocationArea5G ::= SEQUENCE

{

timeOfDay [1] Daytime,

durationSec [2] INTEGER,

location [3] NRLocation

}

Daytime ::= SEQUENCE

{

daysOfWeek [1] Day OPTIONAL,

timeOfDayStart [2] Timestamp OPTIONAL,

timeOfDayEnd [3] Timestamp OPTIONAL

}

Day ::= ENUMERATED

{

monday(1),

tuesday(2),

wednesday(3),

thursday(4),

friday(5),

saturday(6),

sunday(7)

}

TrafficProfile ::= ENUMERATED

{

singleTransUL(1),

singleTransDL(2),

dualTransULFirst(3),

dualTransDLFirst(4),

multiTrans(5)

}

ScheduledCommunicationType ::= ENUMERATED

{

downlinkOnly(1),

uplinkOnly(2),

bidirectional(3)

}

-- =================

-- 5G NEF parameters

-- =================

NEFFailureCause ::= ENUMERATED

{

userUnknown(1),

niddConfigurationNotAvailable(2),

contextNotFound(3),

portNotFree(4),

portNotAssociatedWithSpecifiedApplication(5)

}

NEFReleaseCause ::= ENUMERATED

{

sMFRelease(1),

dNRelease(2),

uDMRelease(3),

cHFRelease(4),

localConfigurationPolicy(5),

unknownCause(6)

}

AFID ::= UTF8String

NEFID ::= UTF8String

-- ==================

-- SCEF definitions

-- ==================

-- See clause 7.8.2.1.2 for details of this structure

SCEFPDNConnectionEstablishment ::= SEQUENCE

{

iMSI [1] IMSI OPTIONAL,

mSISDN [2] MSISDN OPTIONAL,

externalIdentifier [3] NAI OPTIONAL,

iMEI [4] IMEI OPTIONAL,

ePSBearerID [5] EPSBearerID,

sCEFID [6] SCEFID,

aPN [7] APN,

rDSSupport [8] RDSSupport,

sCSASID [9] SCSASID

}

-- See clause 7.8.2.1.3 for details of this structure

SCEFPDNConnectionUpdate ::= SEQUENCE

{

iMSI [1] IMSI OPTIONAL,

mSISDN [2] MSISDN OPTIONAL,

externalIdentifier [3] NAI OPTIONAL,

initiator [4] Initiator,

rDSSourcePortNumber [5] RDSPortNumber OPTIONAL,

rDSDestinationPortNumber [6] RDSPortNumber OPTIONAL,

applicationID [7] ApplicationID OPTIONAL,

sCSASID [8] SCSASID OPTIONAL,

rDSAction [9] RDSAction OPTIONAL,

serializationFormat [10] SerializationFormat OPTIONAL

}

-- See clause 7.8.2.1.4 for details of this structure

SCEFPDNConnectionRelease ::= SEQUENCE

{

iMSI [1] IMSI OPTIONAL,

mSISDN [2] MSISDN OPTIONAL,

externalIdentifier [3] NAI OPTIONAL,

ePSBearerID [4] EPSBearerID,

timeOfFirstPacket [5] Timestamp OPTIONAL,

timeOfLastPacket [6] Timestamp OPTIONAL,

uplinkVolume [7] INTEGER OPTIONAL,

downlinkVolume [8] INTEGER OPTIONAL,

releaseCause [9] SCEFReleaseCause

}

-- See clause 7.8.2.1.5 for details of this structure

SCEFUnsuccessfulProcedure ::= SEQUENCE

{

failureCause [1] SCEFFailureCause,

iMSI [2] IMSI OPTIONAL,

mSISDN [3] MSISDN OPTIONAL,

externalIdentifier [4] NAI OPTIONAL,

ePSBearerID [5] EPSBearerID,

aPN [6] APN,

rDSDestinationPortNumber [7] RDSPortNumber OPTIONAL,

applicationID [8] ApplicationID OPTIONAL,

sCSASID [9] SCSASID

}

-- See clause 7.8.2.1.6 for details of this structure

SCEFStartOfInterceptionWithEstablishedPDNConnection ::= SEQUENCE

{

iMSI [1] IMSI OPTIONAL,

mSISDN [2] MSISDN OPTIONAL,

externalIdentifier [3] NAI OPTIONAL,

iMEI [4] IMEI OPTIONAL,

ePSBearerID [5] EPSBearerID,

sCEFID [6] SCEFID,

aPN [7] APN,

rDSSupport [8] RDSSupport,

sCSASID [9] SCSASID

}

-- See clause 7.8.3.1.1 for details of this structure

SCEFDeviceTrigger ::= SEQUENCE

{

iMSI [1] IMSI,

mSISDN [2] MSISDN,

externalIdentifier [3] NAI,

triggerId [4] TriggerID,

sCSASID [5] SCSASID OPTIONAL,

triggerPayload [6] TriggerPayload OPTIONAL,

validityPeriod [7] INTEGER OPTIONAL,

priorityDT [8] PriorityDT OPTIONAL,

sourcePortId [9] PortNumber OPTIONAL,

destinationPortId [10] PortNumber OPTIONAL

}

-- See clause 7.8.3.1.2 for details of this structure

SCEFDeviceTriggerReplace ::= SEQUENCE

{

iMSI [1] IMSI OPTIONAL,

mSISDN [2] MSISDN OPTIONAL,

externalIdentifier [3] NAI OPTIONAL,

triggerId [4] TriggerID,

sCSASID [5] SCSASID OPTIONAL,

triggerPayload [6] TriggerPayload OPTIONAL,

validityPeriod [7] INTEGER OPTIONAL,

priorityDT [8] PriorityDT OPTIONAL,

sourcePortId [9] PortNumber OPTIONAL,

destinationPortId [10] PortNumber OPTIONAL

}

-- See clause 7.8.3.1.3 for details of this structure

SCEFDeviceTriggerCancellation ::= SEQUENCE

{

iMSI [1] IMSI OPTIONAL,

mSISDN [2] MSISDN OPTIONAL,

externalIdentifier [3] NAI OPTIONAL,

triggerId [4] TriggerID

}

-- See clause 7.8.3.1.4 for details of this structure

SCEFDeviceTriggerReportNotify ::= SEQUENCE

{

iMSI [1] IMSI OPTIONAL,

mSISDN [2] MSISDN OPTIONAL,

externalIdentifier [3] NAI OPTIONAL,

triggerId [4] TriggerID,

deviceTriggerDeliveryResult [5] DeviceTriggerDeliveryResult

}

-- See clause 7.8.4.1.1 for details of this structure

SCEFMSISDNLessMOSMS ::= SEQUENCE

{

iMSI [1] IMSI OPTIONAL,

mSISDN [2] MSISDN OPTIONAL,

externalIdentifie [3] NAI OPTIONAL,

terminatingSMSParty [4] SCSASID,

sMS [5] SMSTPDUData OPTIONAL,

sourcePort [6] PortNumber OPTIONAL,

destinationPort [7] PortNumber OPTIONAL

}

-- See clause 7.8.5.1.1 for details of this structure

SCEFCommunicationPatternUpdate ::= SEQUENCE

{

mSISDN [1] MSISDN OPTIONAL,

externalIdentifier [2] NAI OPTIONAL,

periodicCommunicationIndicator [3] PeriodicCommunicationIndicator OPTIONAL,

communicationDurationTime [4] INTEGER OPTIONAL,

periodicTime [5] INTEGER OPTIONAL,

scheduledCommunicationTime [6] ScheduledCommunicationTime OPTIONAL,

scheduledCommunicationType [7] ScheduledCommunicationType OPTIONAL,

stationaryIndication [8] StationaryIndication OPTIONAL,

batteryIndication [9] BatteryIndication OPTIONAL,

trafficProfile [10] TrafficProfile OPTIONAL,

expectedUEMovingTrajectory [11] SEQUENCE OF UMTLocationArea5G OPTIONAL,

sCSASID [13] SCSASID,

validityTime [14] Timestamp OPTIONAL

}

-- =================

-- SCEF parameters

-- =================

SCEFFailureCause ::= ENUMERATED

{

userUnknown(1),

niddConfigurationNotAvailable(2),

invalidEPSBearer(3),

operationNotAllowed(4),

portNotFree(5),

portNotAssociatedWithSpecifiedApplication(6)

}

SCEFReleaseCause ::= ENUMERATED

{

mMERelease(1),

dNRelease(2),

hSSRelease(3),

localConfigurationPolicy(4),

unknownCause(5)

}

SCSASID ::= UTF8String

SCEFID ::= UTF8String

PeriodicCommunicationIndicator ::= ENUMERATED

{

periodic(1),

nonPeriodic(2)

}

EPSBearerID ::= INTEGER (0..255)

APN ::= UTF8String

-- =======================

-- AKMA AAnF definitions

-- =======================

AAnFAnchorKeyRegister ::= SEQUENCE

{

aKID [1] NAI,

sUPI [2] SUPI,

kAKMA [3] KAKMA OPTIONAL

}

AAnFKAKMAApplicationKeyGet ::= SEQUENCE

{

type [1] KeyGetType,

aKID [2] NAI,

keyInfo [3] AFKeyInfo

}

AAnFStartOfInterceptWithEstablishedAKMAKeyMaterial ::= SEQUENCE

{

aKID [1] NAI,

kAKMA [2] KAKMA OPTIONAL,

aFKeyList [3] SEQUENCE OF AFKeyInfo OPTIONAL

}

AAnFAKMAContextRemovalRecord ::= SEQUENCE

{

aKID [1] NAI,

nFID [2] NFID

}

-- ======================

-- AKMA common parameters

-- ======================

FQDN ::= UTF8String

NFID ::= UTF8String

UAProtocolID ::= OCTET STRING (SIZE(5))

AKMAAFID ::= SEQUENCE

{

aFFQDN [1] FQDN,

uaProtocolID [2] UAProtocolID

}

UAStarParams ::= CHOICE

{

tls12 [1] TLS12UAStarParams,

generic [2] GenericUAStarParams

}

GenericUAStarParams ::= SEQUENCE

{

genericClientParams [1] OCTET STRING,

genericServerParams [2] OCTET STRING

}

-- ===========================================

-- Specific UaStarParmas for TLS 1.2 (RFC5246)

-- ===========================================

TLSCipherType ::= ENUMERATED

{

stream(1),

block(2),

aead(3)

}

TLSCompressionAlgorithm ::= ENUMERATED

{

null(1),

deflate(2)

}

TLSPRFAlgorithm ::= ENUMERATED

{

rfc5246(1)

}

TLSCipherSuite ::= SEQUENCE (SIZE(2)) OF INTEGER (0..255)

TLS12UAStarParams ::= SEQUENCE

{

preMasterSecret [1] OCTET STRING (SIZE(6)) OPTIONAL,

masterSecret [2] OCTET STRING (SIZE(6)),

pRFAlgorithm [3] TLSPRFAlgorithm,

cipherSuite [4] TLSCipherSuite,

cipherType [5] TLSCipherType,

encKeyLength [6] INTEGER (0..255),

blockLength [7] INTEGER (0..255),

fixedIVLength [8] INTEGER (0..255),

recordIVLength [9] INTEGER (0..255),

macLength [10] INTEGER (0..255),

macKeyLength [11] INTEGER (0..255),

compressionAlgorithm [12] TLSCompressionAlgorithm,

clientRandom [13] OCTET STRING (SIZE(4)),

serverRandom [14] OCTET STRING (SIZE(4)),

clientSequenceNumber [15] INTEGER,

serverSequenceNumber [16] INTEGER,

sessionID [17] OCTET STRING (SIZE(0..32)),

tLSExtensions [18] OCTET STRING (SIZE(0..65535))

}

KAF ::= OCTET STRING

KAKMA ::= OCTET STRING

-- ====================

-- AKMA AAnF parameters

-- ====================

KeyGetType ::= ENUMERATED

{

internal(1),

external(2)

}

AFKeyInfo ::= SEQUENCE

{

aFID [1] AKMAAFID,

kAF [2] KAF,

kAFExpTime [3] KAFExpiryTime

}

-- =======================

-- AKMA AF definitions

-- =======================

AFAKMAApplicationKeyRefresh ::= SEQUENCE

{

aFID [1] AFID,

aKID [2] NAI,

kAF [3] KAF,

uaStarParams [4] UAStarParams OPTIONAL

}

AFStartOfInterceptWithEstablishedAKMAApplicationKey ::= SEQUENCE

{

aFID [1] FQDN,

aKID [2] NAI,

kAFParamList [3] SEQUENCE OF AFSecurityParams

}

AFAuxiliarySecurityParameterEstablishment ::= SEQUENCE

{

aFSecurityParams [1] AFSecurityParams

}

AFSecurityParams ::= SEQUENCE

{

aFID [1] AFID,

aKID [2] NAI,

kAF [3] KAF,

uaStarParams [4] UAStarParams

}

AFApplicationKeyRemoval ::= SEQUENCE

{

aFID [1] AFID,

aKID [2] NAI,

removalCause [3] AFKeyRemovalCause

}

-- ===================

-- AKMA AF parameters

-- ===================

KAFParams ::= SEQUENCE

{

aKID [1] NAI,

kAF [2] KAF,

kAFExpTime [3] KAFExpiryTime,

uaStarParams [4] UAStarParams

}

KAFExpiryTime ::= GeneralizedTime

AFKeyRemovalCause ::= ENUMERATED

{

unknown(1),

keyExpiry(2),

applicationSpecific(3)

}

-- ==================

-- 5G AMF definitions

-- ==================

-- See clause 6.2.2.2.2 for details of this structure

AMFRegistration ::= SEQUENCE

{

registrationType [1] AMFRegistrationType,

registrationResult [2] AMFRegistrationResult,

slice [3] Slice OPTIONAL,

sUPI [4] SUPI,

sUCI [5] SUCI OPTIONAL,

pEI [6] PEI OPTIONAL,

gPSI [7] GPSI OPTIONAL,

gUTI [8] FiveGGUTI,

location [9] Location OPTIONAL,

non3GPPAccessEndpoint [10] UEEndpointAddress OPTIONAL,

fiveGSTAIList [11] TAIList OPTIONAL,

sMSOverNasIndicator [12] SMSOverNASIndicator OPTIONAL,

oldGUTI [13] EPS5GGUTI OPTIONAL,

eMM5GRegStatus [14] EMM5GMMStatus OPTIONAL,

nonIMEISVPEI [15] NonIMEISVPEI OPTIONAL,

mACRestIndicator [16] MACRestrictionIndicator OPTIONAL

}

-- See clause 6.2.2.2.3 for details of this structure

AMFDeregistration ::= SEQUENCE

{

deregistrationDirection [1] AMFDirection,

accessType [2] AccessType,

sUPI [3] SUPI OPTIONAL,

sUCI [4] SUCI OPTIONAL,

pEI [5] PEI OPTIONAL,

gPSI [6] GPSI OPTIONAL,

gUTI [7] FiveGGUTI OPTIONAL,

cause [8] FiveGMMCause OPTIONAL,

location [9] Location OPTIONAL,

switchOffIndicator [10] SwitchOffIndicator OPTIONAL,

reRegRequiredIndicator [11] ReRegRequiredIndicator OPTIONAL

}

-- See clause 6.2.2.2.4 for details of this structure

AMFLocationUpdate ::= SEQUENCE

{

sUPI [1] SUPI,

sUCI [2] SUCI OPTIONAL,

pEI [3] PEI OPTIONAL,

gPSI [4] GPSI OPTIONAL,

gUTI [5] FiveGGUTI OPTIONAL,

location [6] Location,

sMSOverNASIndicator [7] SMSOverNASIndicator OPTIONAL,

oldGUTI [8] EPS5GGUTI OPTIONAL

}

-- See clause 6.2.2.2.5 for details of this structure

AMFStartOfInterceptionWithRegisteredUE ::= SEQUENCE

{

registrationResult [1] AMFRegistrationResult,

registrationType [2] AMFRegistrationType OPTIONAL,

slice [3] Slice OPTIONAL,

sUPI [4] SUPI,

sUCI [5] SUCI OPTIONAL,

pEI [6] PEI OPTIONAL,

gPSI [7] GPSI OPTIONAL,

gUTI [8] FiveGGUTI,

location [9] Location OPTIONAL,

non3GPPAccessEndpoint [10] UEEndpointAddress OPTIONAL,

timeOfRegistration [11] Timestamp OPTIONAL,

fiveGSTAIList [12] TAIList OPTIONAL,

sMSOverNASIndicator [13] SMSOverNASIndicator OPTIONAL,

oldGUTI [14] EPS5GGUTI OPTIONAL,

eMM5GRegStatus [15] EMM5GMMStatus OPTIONAL

}

-- See clause 6.2.2.2.6 for details of this structure

AMFUnsuccessfulProcedure ::= SEQUENCE

{

failedProcedureType [1] AMFFailedProcedureType,

failureCause [2] AMFFailureCause,

requestedSlice [3] NSSAI OPTIONAL,

sUPI [4] SUPI OPTIONAL,

sUCI [5] SUCI OPTIONAL,

pEI [6] PEI OPTIONAL,

gPSI [7] GPSI OPTIONAL,

gUTI [8] FiveGGUTI OPTIONAL,

location [9] Location OPTIONAL

}

-- See clause 6.2.2.2.8 on for details of this structure

AMFPositioningInfoTransfer ::= SEQUENCE

{

sUPI [1] SUPI,

sUCI [2] SUCI OPTIONAL,

pEI [3] PEI OPTIONAL,

gPSI [4] GPSI OPTIONAL,

gUTI [5] FiveGGUTI OPTIONAL,

nRPPaMessage [6] OCTET STRING OPTIONAL,

lPPMessage [7] OCTET STRING OPTIONAL,

lcsCorrelationId [8] UTF8String (SIZE(1..255))

}

-- =================

-- 5G AMF parameters

-- =================

AMFID ::= SEQUENCE

{

aMFRegionID [1] AMFRegionID,

aMFSetID [2] AMFSetID,

aMFPointer [3] AMFPointer

}

AMFDirection ::= ENUMERATED

{

networkInitiated(1),

uEInitiated(2)

}

AMFFailedProcedureType ::= ENUMERATED

{

registration(1),

sMS(2),

pDUSessionEstablishment(3)

}

AMFFailureCause ::= CHOICE

{

fiveGMMCause [1] FiveGMMCause,

fiveGSMCause [2] FiveGSMCause

}

AMFPointer ::= INTEGER (0..63)

AMFRegistrationResult ::= ENUMERATED

{

threeGPPAccess(1),

nonThreeGPPAccess(2),

threeGPPAndNonThreeGPPAccess(3)

}

AMFRegionID ::= INTEGER (0..255)

AMFRegistrationType ::= ENUMERATED

{

initial(1),

mobility(2),

periodic(3),

emergency(4)

}

AMFSetID ::= INTEGER (0..1023)

-- ==================

-- 5G SMF definitions

-- ==================

-- See clause 6.2.3.2.2 for details of this structure

SMFPDUSessionEstablishment ::= SEQUENCE

{

sUPI [1] SUPI OPTIONAL,

sUPIUnauthenticated [2] SUPIUnauthenticatedIndication OPTIONAL,

pEI [3] PEI OPTIONAL,

gPSI [4] GPSI OPTIONAL,

pDUSessionID [5] PDUSessionID,

gTPTunnelID [6] FTEID,

pDUSessionType [7] PDUSessionType,

sNSSAI [8] SNSSAI OPTIONAL,

uEEndpoint [9] SEQUENCE OF UEEndpointAddress OPTIONAL,

non3GPPAccessEndpoint [10] UEEndpointAddress OPTIONAL,

location [11] Location OPTIONAL,

dNN [12] DNN,

aMFID [13] AMFID OPTIONAL,

hSMFURI [14] HSMFURI OPTIONAL,

requestType [15] FiveGSMRequestType,

accessType [16] AccessType OPTIONAL,

rATType [17] RATType OPTIONAL,

sMPDUDNRequest [18] SMPDUDNRequest OPTIONAL,

uEEPSPDNConnection [19] UEEPSPDNConnection OPTIONAL,

ePS5GSComboInfo [20] EPS5GSComboInfo OPTIONAL

}

-- See clause 6.2.3.2.3 for details of this structure

SMFPDUSessionModification ::= SEQUENCE

{

sUPI [1] SUPI OPTIONAL,

sUPIUnauthenticated [2] SUPIUnauthenticatedIndication OPTIONAL,

pEI [3] PEI OPTIONAL,

gPSI [4] GPSI OPTIONAL,

sNSSAI [5] SNSSAI OPTIONAL,

non3GPPAccessEndpoint [6] UEEndpointAddress OPTIONAL,

location [7] Location OPTIONAL,

requestType [8] FiveGSMRequestType,

accessType [9] AccessType OPTIONAL,

rATType [10] RATType OPTIONAL,

pDUSessionID [11] PDUSessionID OPTIONAL,

ePS5GSComboInfo [12] EPS5GSComboInfo OPTIONAL,

pCCRuleID [13] UTF8String OPTIONAL,

appId [14] UTF8String OPTIONAL,

flowInfos [15] SET OF FlowInformation OPTIONAL,

appReloc [16] BOOLEAN OPTIONAL,

simConnInd [17] BOOLEAN OPTIONAL,

simConnTerm [18] INTEGER OPTIONAL,

maxAllowedUpLat [19] INTEGER OPTIONAL,

trafficRoutes [20] SET OF RouteToLocation,

trafficSteeringPolicyDownlink [21] UTF8String OPTIONAL,

trafficSteeringPolicyUplink [22] UTF8String OPTIONAL,

sourceDNAI [23] DNAI OPTIONAL,

targetDNAI [24] DNAI OPTIONAL,

dNAIChangeType [25] DNAIChangeType OPTIONAL,

sourceUEIPAddr [26] IPAddress OPTIONAL,

targetUEIPAddr [27] IPAddress OPTIONAL,

sourceTrafficRouting [28] RouteToLocation OPTIONAL,

targetTrafficRouting [29] RouteToLocation OPTIONAL,

eASIPReplaceInfos [30] EASIPReplaceInfos OPTIONAL

}

-- See clause 6.2.3.2.4 for details of this structure

SMFPDUSessionRelease ::= SEQUENCE

{

sUPI [1] SUPI,

pEI [2] PEI OPTIONAL,

gPSI [3] GPSI OPTIONAL,

pDUSessionID [4] PDUSessionID,

timeOfFirstPacket [5] Timestamp OPTIONAL,

timeOfLastPacket [6] Timestamp OPTIONAL,

uplinkVolume [7] INTEGER OPTIONAL,

downlinkVolume [8] INTEGER OPTIONAL,

location [9] Location OPTIONAL,

cause [10] SMFErrorCodes OPTIONAL,

ePS5GSComboInfo [11] EPS5GSComboInfo OPTIONAL

}

-- See clause 6.2.3.2.5 for details of this structure

SMFStartOfInterceptionWithEstablishedPDUSession ::= SEQUENCE

{

sUPI [1] SUPI OPTIONAL,

sUPIUnauthenticated [2] SUPIUnauthenticatedIndication OPTIONAL,

pEI [3] PEI OPTIONAL,

gPSI [4] GPSI OPTIONAL,

pDUSessionID [5] PDUSessionID,

gTPTunnelID [6] FTEID,

pDUSessionType [7] PDUSessionType,

sNSSAI [8] SNSSAI OPTIONAL,

uEEndpoint [9] SEQUENCE OF UEEndpointAddress,

non3GPPAccessEndpoint [10] UEEndpointAddress OPTIONAL,

location [11] Location OPTIONAL,

dNN [12] DNN,

aMFID [13] AMFID OPTIONAL,

hSMFURI [14] HSMFURI OPTIONAL,

requestType [15] FiveGSMRequestType,

accessType [16] AccessType OPTIONAL,

rATType [17] RATType OPTIONAL,

sMPDUDNRequest [18] SMPDUDNRequest OPTIONAL,

timeOfSessionEstablishment [19] Timestamp OPTIONAL,

ePS5GSComboInfo [20] EPS5GSComboInfo OPTIONAL

}

-- See clause 6.2.3.2.6 for details of this structure

SMFUnsuccessfulProcedure ::= SEQUENCE

{

failedProcedureType [1] SMFFailedProcedureType,

failureCause [2] FiveGSMCause,

initiator [3] Initiator,

requestedSlice [4] NSSAI OPTIONAL,

sUPI [5] SUPI OPTIONAL,

sUPIUnauthenticated [6] SUPIUnauthenticatedIndication OPTIONAL,

pEI [7] PEI OPTIONAL,

gPSI [8] GPSI OPTIONAL,

pDUSessionID [9] PDUSessionID OPTIONAL,

uEEndpoint [10] SEQUENCE OF UEEndpointAddress OPTIONAL,

non3GPPAccessEndpoint [11] UEEndpointAddress OPTIONAL,

dNN [12] DNN OPTIONAL,

aMFID [13] AMFID OPTIONAL,

hSMFURI [14] HSMFURI OPTIONAL,

requestType [15] FiveGSMRequestType OPTIONAL,

accessType [16] AccessType OPTIONAL,

rATType [17] RATType OPTIONAL,

sMPDUDNRequest [18] SMPDUDNRequest OPTIONAL,

location [19] Location OPTIONAL

}

-- See clause 6.2.3.2.8 for details of this structure

SMFPDUtoMAPDUSessionModification ::= SEQUENCE

{

sUPI [1] SUPI OPTIONAL,

sUPIUnauthenticated [2] SUPIUnauthenticatedIndication OPTIONAL,

pEI [3] PEI OPTIONAL,

gPSI [4] GPSI OPTIONAL,

sNSSAI [5] SNSSAI OPTIONAL,

non3GPPAccessEndpoint [6] UEEndpointAddress OPTIONAL,

location [7] Location OPTIONAL,

requestType [8] FiveGSMRequestType,

accessType [9] AccessType OPTIONAL,

rATType [10] RATType OPTIONAL,

pDUSessionID [11] PDUSessionID,

requestIndication [12] RequestIndication,

aTSSSContainer [13] ATSSSContainer

}

-- See clause 6.2.3.2.7.1 for details of this structure

SMFMAPDUSessionEstablishment ::= SEQUENCE

{

sUPI [1] SUPI OPTIONAL,

sUPIUnauthenticated [2] SUPIUnauthenticatedIndication OPTIONAL,

pEI [3] PEI OPTIONAL,

gPSI [4] GPSI OPTIONAL,

pDUSessionID [5] PDUSessionID,

pDUSessionType [6] PDUSessionType,

accessInfo [7] SEQUENCE OF AccessInfo,

sNSSAI [8] SNSSAI OPTIONAL,

uEEndpoint [9] SEQUENCE OF UEEndpointAddress OPTIONAL,

location [10] Location OPTIONAL,

dNN [11] DNN,

aMFID [12] AMFID OPTIONAL,

hSMFURI [13] HSMFURI OPTIONAL,

requestType [14] FiveGSMRequestType,

sMPDUDNRequest [15] SMPDUDNRequest OPTIONAL,

servingNetwork [16] SMFServingNetwork,

oldPDUSessionID [17] PDUSessionID OPTIONAL,

mAUpgradeIndication [18] SMFMAUpgradeIndication OPTIONAL,

ePSPDNCnxInfo [19] SMFEPSPDNCnxInfo OPTIONAL,

mAAcceptedIndication [20] SMFMAAcceptedIndication,

aTSSSContainer [21] ATSSSContainer OPTIONAL

}

-- See clause 6.2.3.2.7.2 for details of this structure

SMFMAPDUSessionModification ::= SEQUENCE

{

sUPI [1] SUPI OPTIONAL,

sUPIUnauthenticated [2] SUPIUnauthenticatedIndication OPTIONAL,

pEI [3] PEI OPTIONAL,

gPSI [4] GPSI OPTIONAL,

pDUSessionID [5] PDUSessionID,

accessInfo [6] SEQUENCE OF AccessInfo OPTIONAL,

sNSSAI [7] SNSSAI OPTIONAL,

location [8] Location OPTIONAL,

requestType [9] FiveGSMRequestType OPTIONAL,

servingNetwork [10] SMFServingNetwork,

oldPDUSessionID [11] PDUSessionID OPTIONAL,

mAUpgradeIndication [12] SMFMAUpgradeIndication OPTIONAL,

ePSPDNCnxInfo [13] SMFEPSPDNCnxInfo OPTIONAL,

mAAcceptedIndication [14] SMFMAAcceptedIndication,

aTSSSContainer [15] ATSSSContainer OPTIONAL

}

-- See clause 6.2.3.2.7.3 for details of this structure

SMFMAPDUSessionRelease ::= SEQUENCE

{

sUPI [1] SUPI,

pEI [2] PEI OPTIONAL,

gPSI [3] GPSI OPTIONAL,

pDUSessionID [4] PDUSessionID,

timeOfFirstPacket [5] Timestamp OPTIONAL,

timeOfLastPacket [6] Timestamp OPTIONAL,

uplinkVolume [7] INTEGER OPTIONAL,

downlinkVolume [8] INTEGER OPTIONAL,

location [9] Location OPTIONAL,

cause [10] SMFErrorCodes OPTIONAL

}

-- See clause 6.2.3.2.7.4 for details of this structure

SMFStartOfInterceptionWithEstablishedMAPDUSession ::= SEQUENCE

{

sUPI [1] SUPI OPTIONAL,

sUPIUnauthenticated [2] SUPIUnauthenticatedIndication OPTIONAL,

pEI [3] PEI OPTIONAL,

gPSI [4] GPSI OPTIONAL,

pDUSessionID [5] PDUSessionID,

pDUSessionType [6] PDUSessionType,

accessInfo [7] SEQUENCE OF AccessInfo,

sNSSAI [8] SNSSAI OPTIONAL,

uEEndpoint [9] SEQUENCE OF UEEndpointAddress OPTIONAL,

location [10] Location OPTIONAL,

dNN [11] DNN,

aMFID [12] AMFID OPTIONAL,

hSMFURI [13] HSMFURI OPTIONAL,

requestType [14] FiveGSMRequestType OPTIONAL,

sMPDUDNRequest [15] SMPDUDNRequest OPTIONAL,

servingNetwork [16] SMFServingNetwork,

oldPDUSessionID [17] PDUSessionID OPTIONAL,

mAUpgradeIndication [18] SMFMAUpgradeIndication OPTIONAL,

ePSPDNCnxInfo [19] SMFEPSPDNCnxInfo OPTIONAL,

mAAcceptedIndication [20] SMFMAAcceptedIndication,

aTSSSContainer [21] ATSSSContainer OPTIONAL

}

-- See clause 6.2.3.2.7.5 for details of this structure

SMFMAUnsuccessfulProcedure ::= SEQUENCE

{

failedProcedureType [1] SMFFailedProcedureType,

failureCause [2] FiveGSMCause,

requestedSlice [3] NSSAI OPTIONAL,

initiator [4] Initiator,

sUPI [5] SUPI OPTIONAL,

sUPIUnauthenticated [6] SUPIUnauthenticatedIndication OPTIONAL,

pEI [7] PEI OPTIONAL,

gPSI [8] GPSI OPTIONAL,

pDUSessionID [9] PDUSessionID OPTIONAL,

accessInfo [10] SEQUENCE OF AccessInfo,

uEEndpoint [11] SEQUENCE OF UEEndpointAddress OPTIONAL,

location [12] Location OPTIONAL,

dNN [13] DNN OPTIONAL,

aMFID [14] AMFID OPTIONAL,

hSMFURI [15] HSMFURI OPTIONAL,

requestType [16] FiveGSMRequestType OPTIONAL,

sMPDUDNRequest [17] SMPDUDNRequest OPTIONAL

}

-- =================

-- 5G SMF parameters

-- =================

SMFID ::= UTF8String

SMFFailedProcedureType ::= ENUMERATED

{

pDUSessionEstablishment(1),

pDUSessionModification(2),

pDUSessionRelease(3)

}

SMFServingNetwork ::= SEQUENCE

{

pLMNID [1] PLMNID,

nID [2] NID OPTIONAL

}

AccessInfo ::= SEQUENCE

{

accessType [1] AccessType,

rATType [2] RATType OPTIONAL,

gTPTunnelID [3] FTEID,

non3GPPAccessEndpoint [4] UEEndpointAddress OPTIONAL,

establishmentStatus [5] EstablishmentStatus,

aNTypeToReactivate [6] AccessType OPTIONAL

}

-- see Clause 6.1.2 of TS 24.193[44] for the details of the ATSSS container contents.

ATSSSContainer ::= OCTET STRING

EstablishmentStatus ::= ENUMERATED

{

established(0),

released(1)

}

SMFMAUpgradeIndication ::= BOOLEAN

-- Given in YAML encoding as defined in clause 6.1.6.2.31 of TS 29.502[16]

SMFEPSPDNCnxInfo ::= UTF8String

SMFMAAcceptedIndication ::= BOOLEAN

-- see Clause 6.1.6.3.8 of TS 29.502[16] for the details of this structure.

SMFErrorCodes ::= UTF8String

-- see Clause 6.1.6.3.2 of TS 29.502[16] for details of this structure.

UEEPSPDNConnection ::= OCTET STRING

-- see Clause 6.1.6.3.6 of TS 29.502[16] for the details of this structure.

RequestIndication ::= ENUMERATED

{

uEREQPDUSESMOD(0),

uEREQPDUSESREL(1),

pDUSESMOB(2),

nWREQPDUSESAUTH(3),

nWREQPDUSESMOD(4),

nWREQPDUSESREL(5),

eBIASSIGNMENTREQ(6),

rELDUETO5GANREQUEST(7)

}

FlowInformation ::= SEQUENCE

{

flowDescription [1] FlowDescription OPTIONAL,

tosTrafficClass [2] OCTET STRING (SIZE(2)) OPTIONAL,

spi [3] OCTET STRING (SIZE(4)) OPTIONAL,

flowLabel [4] OCTET STRING (SIZE(3)) OPTIONAL,

flowDirection [5] FlowDirection OPTIONAL

}

FlowDescription ::= CHOICE

{

ipFlowDescr [1] UTF8String,

ethFlowDescr [2] UTF8String

}

FlowDirection ::= ENUMERATED

{

downlinkOnly(1),

uplinkOnly(2),

dowlinkAndUplink(3)

}

DNAIChangeType ::= ENUMERATED

{

early(1),

earlyAndLate(2),

late(3)

}

RouteToLocation ::= SEQUENCE

{

dNAI [1] DNAI,

routeInfo [2] RouteInfo

}

DNAI ::= UTF8String

RouteInfo ::= SEQUENCE

{

iPAddressTunnelEndpoint [1] IPAddress,

uDPPortNumberTunnelEndpoint [2] PortNumber

}

EASIPReplaceInfos ::= SEQUENCE

{

sourceEASAddress [1] EASServerAddress,

targetEASAddress [2] EASServerAddress

}

EASServerAddress ::= SEQUENCE

{

iPAddress [1] IPAddress,

port [2] PortNumber

}

-- ======================

-- PGW-C + SMF Parameters

-- ======================

EPS5GSComboInfo ::= SEQUENCE

{

ePSInterworkingIndication [1] EPSInterworkingIndication,

ePSSubscriberIDs [2] EPSSubscriberIDs,

ePSPDNCnxInfo [3] EPSPDNCnxInfo OPTIONAL,

ePSBearerInfo [4] EPSBearerInfo OPTIONAL

}

EPSInterworkingIndication ::= ENUMERATED

{

none(1),

withN26(2),

withoutN26(3),

iwkNon3GPP(4)

}

EPSSubscriberIDs ::= SEQUENCE

{

iMSI [1] IMSI OPTIONAL,

mSISDN [2] MSISDN OPTIONAL,

iMEI [3] IMEI OPTIONAL

}

EPSPDNCnxInfo ::= SEQUENCE

{

pGWS8ControlPlaneFTEID [1] FTEID,

linkedBearerID [2] EPSBearerID OPTIONAL

}

EPSBearerInfo ::= SEQUENCE OF EPSBearers

EPSBearers ::= SEQUENCE

{

ePSBearerID [1] EPSBearerID,

pGWS8UserPlaneFTEID [2] FTEID,

qCI [3] QCI

}

QCI ::= INTEGER (0..255)

-- ==================

-- 5G UPF definitions

-- ==================

UPFCCPDU ::= OCTET STRING

-- See clause 6.2.3.8 for the details of this structure

ExtendedUPFCCPDU ::= SEQUENCE

{

payload [1] UPFCCPDUPayload,

qFI [2] QFI OPTIONAL

}

-- =================

-- 5G UPF parameters

-- =================

UPFCCPDUPayload ::= CHOICE

{

uPFIPCC [1] OCTET STRING,

uPFEthernetCC [2] OCTET STRING,

uPFUnstructuredCC [3] OCTET STRING

}

QFI ::= INTEGER (0..63)

-- ==================

-- 5G UDM definitions

-- ==================

UDMServingSystemMessage ::= SEQUENCE

{

sUPI [1] SUPI,

pEI [2] PEI OPTIONAL,

gPSI [3] GPSI OPTIONAL,

gUAMI [4] GUAMI OPTIONAL,

gUMMEI [5] GUMMEI OPTIONAL,

pLMNID [6] PLMNID OPTIONAL,

servingSystemMethod [7] UDMServingSystemMethod,

serviceID [8] ServiceID OPTIONAL

}

UDMSubscriberRecordChangeMessage ::= SEQUENCE

{

sUPI [1] SUPI OPTIONAL,

pEI [2] PEI OPTIONAL,

gPSI [3] GPSI OPTIONAL,

oldPEI [4] PEI OPTIONAL,

oldSUPI [5] SUPI OPTIONAL,

oldGPSI [6] GPSI OPTIONAL,

oldserviceID [7] ServiceID OPTIONAL,

subscriberRecordChangeMethod [8] UDMSubscriberRecordChangeMethod,

serviceID [9] ServiceID OPTIONAL

}

UDMCancelLocationMessage ::= SEQUENCE

{

sUPI [1] SUPI,

pEI [2] PEI OPTIONAL,

gPSI [3] GPSI OPTIONAL,

gUAMI [4] GUAMI OPTIONAL,

pLMNID [5] PLMNID OPTIONAL,

cancelLocationMethod [6] UDMCancelLocationMethod

}

UDMLocationInformationResult ::= SEQUENCE

{

sUPI [1] SUPI,

pEI [2] PEI OPTIONAL,

gPSI [3] GPSI OPTIONAL,

locationInfoRequest [4] UDMLocationInfoRequest,

vPLMNID [5] PLMNID OPTIONAL,

currentLocationIndicator [6] BOOLEAN OPTIONAL,

aMFInstanceID [7] NFID OPTIONAL,

sMSFInstanceID [8] NFID OPTIONAL,

location [9] Location OPTIONAL,

rATType [10] RATType OPTIONAL,

problemDetails [11] UDMProblemDetails OPTIONAL

}

UDMUEInformationResponse ::= SEQUENCE

{

sUPI [1] SUPI,

tADSInfo [2] UEContextInfo OPTIONAL,

fiveGSUserStateInfo [3] FiveGSUserStateInfo OPTIONAL,

fiveGSRVCCInfo [4] FiveGSRVCCInfo OPTIONAL,

problemDetails [5] UDMProblemDetails OPTIONAL

}

UDMUEAuthenticationResponse ::= SEQUENCE

{

sUPI [1] SUPI,

authenticationInfoRequest [2] UDMAuthenticationInfoRequest,

aKMAIndicator [3] BOOLEAN OPTIONAL,

problemDetails [4] UDMProblemDetails OPTIONAL

}

-- =================

-- 5G UDM parameters

-- =================

UDMServingSystemMethod ::= ENUMERATED

{

amf3GPPAccessRegistration(0),

amfNon3GPPAccessRegistration(1),

unknown(2)

}

UDMSubscriberRecordChangeMethod ::= ENUMERATED

{

pEIChange(1),

sUPIChange(2),

gPSIChange(3),

uEDeprovisioning(4),

unknown(5),

serviceIDChange(6)

}

UDMCancelLocationMethod ::= ENUMERATED

{

aMF3GPPAccessDeregistration(1),

aMFNon3GPPAccessDeregistration(2),

uDMDeregistration(3),

unknown(4)

}

ServiceID ::= SEQUENCE

{

nSSAI [1] NSSAI OPTIONAL,

cAGID [2] SEQUENCE OF CAGID OPTIONAL

}

CAGID ::= UTF8String

UDMAuthenticationInfoRequest ::= SEQUENCE

{

infoRequestType [1] UDMInfoRequestType,

rGAuthCtx [2] SEQUENCE SIZE(1..MAX) OF SubscriberIdentifier,

authType [3] PrimaryAuthenticationType,

servingNetworkName [4] PLMNID,

aUSFInstanceID [5] NFID OPTIONAL,

cellCAGInfo [6] CAGID OPTIONAL,

n5GCIndicator [7] BOOLEAN OPTIONAL

}

UDMLocationInfoRequest ::= SEQUENCE

{

requested5GSLocation [1] BOOLEAN OPTIONAL,

requestedCurrentLocation [2] BOOLEAN OPTIONAL,

requestedRATType [3] BOOLEAN OPTIONAL,

requestedTimeZone [4] BOOLEAN OPTIONAL,

requestedServingNode [5] BOOLEAN OPTIONAL

}

UDMProblemDetails ::= SEQUENCE

{

cause [1] UDMProblemDetailsCause OPTIONAL

}

UDMProblemDetailsCause ::= CHOICE

{

uDMDefinedCause [1] UDMDefinedCause,

otherCause [2] UDMProblemDetailsOtherCause

}

UDMDefinedCause ::= ENUMERATED

{

userNotFound(1),

dataNotFound(2),

contextNotFound(3),

subscriptionNotFound(4),

other(5)

}

UDMInfoRequestType ::= ENUMERATED

{

hSS(1),

aUSF(2),

other(3)

}

UDMProblemDetailsOtherCause ::= SEQUENCE

{

problemDetailsType [1] UTF8String OPTIONAL,

title [2] UTF8String OPTIONAL,

status [3] INTEGER OPTIONAL,

detail [4] UTF8String OPTIONAL,

instance [5] UTF8String OPTIONAL,

cause [6] UTF8String OPTIONAL,

uDMInvalidParameters [7] UDMInvalidParameters,

uDMSupportedFeatures [8] UTF8String

}

UDMInvalidParameters ::= SEQUENCE

{

parameter [1] UTF8String OPTIONAL,

reason [2] UTF8String OPTIONAL

}

-- ===================

-- 5G SMSF definitions

-- ===================

-- See clause 6.2.5.3 for details of this structure

SMSMessage ::= SEQUENCE

{

originatingSMSParty [1] SMSParty,

terminatingSMSParty [2] SMSParty,

direction [3] Direction,

linkTransferStatus [4] SMSTransferStatus,

otherMessage [5] SMSOtherMessageIndication OPTIONAL,

location [6] Location OPTIONAL,

peerNFAddress [7] SMSNFAddress OPTIONAL,

peerNFType [8] SMSNFType OPTIONAL,

sMSTPDUData [9] SMSTPDUData OPTIONAL,

messageType [10] SMSMessageType OPTIONAL,

rPMessageReference [11] SMSRPMessageReference OPTIONAL

}

SMSReport ::= SEQUENCE

{

location [1] Location OPTIONAL,

sMSTPDUData [2] SMSTPDUData,

messageType [3] SMSMessageType,

rPMessageReference [4] SMSRPMessageReference

}

-- ==================

-- 5G SMSF parameters

-- ==================

SMSAddress ::= OCTET STRING(SIZE(2..12))

SMSMessageType ::= ENUMERATED

{

deliver(1),

deliverReportAck(2),

deliverReportError(3),

statusReport(4),

command(5),

submit(6),

submitReportAck(7),

submitReportError(8),

reserved(9)

}

SMSParty ::= SEQUENCE

{

sUPI [1] SUPI OPTIONAL,

pEI [2] PEI OPTIONAL,

gPSI [3] GPSI OPTIONAL,

sMSAddress [4] SMSAddress OPTIONAL

}

SMSTransferStatus ::= ENUMERATED

{

transferSucceeded(1),

transferFailed(2),

undefined(3)

}

SMSOtherMessageIndication ::= BOOLEAN

SMSNFAddress ::= CHOICE

{

iPAddress [1] IPAddress,

e164Number [2] E164Number

}

SMSNFType ::= ENUMERATED

{

sMSGMSC(1),

iWMSC(2),

sMSRouter(3)

}

SMSRPMessageReference ::= INTEGER (0..255)

SMSTPDUData ::= CHOICE

{

sMSTPDU [1] SMSTPDU,

truncatedSMSTPDU [2] TruncatedSMSTPDU

}

SMSTPDU ::= OCTET STRING (SIZE(1..270))

TruncatedSMSTPDU ::= OCTET STRING (SIZE(1..130))

-- ===============

-- MMS definitions

-- ===============

MMSSend ::= SEQUENCE

{

transactionID [1] UTF8String,

version [2] MMSVersion,

dateTime [3] Timestamp,

originatingMMSParty [4] MMSParty,

terminatingMMSParty [5] SEQUENCE OF MMSParty OPTIONAL,

cCRecipients [6] SEQUENCE OF MMSParty OPTIONAL,

bCCRecipients [7] SEQUENCE OF MMSParty OPTIONAL,

direction [8] MMSDirection,

subject [9] MMSSubject OPTIONAL,

messageClass [10] MMSMessageClass OPTIONAL,

expiry [11] MMSExpiry,

desiredDeliveryTime [12] Timestamp OPTIONAL,

priority [13] MMSPriority OPTIONAL,

senderVisibility [14] BOOLEAN OPTIONAL,

deliveryReport [15] BOOLEAN OPTIONAL,

readReport [16] BOOLEAN OPTIONAL,

store [17] BOOLEAN OPTIONAL,

state [18] MMState OPTIONAL,

flags [19] MMFlags OPTIONAL,

replyCharging [20] MMSReplyCharging OPTIONAL,

applicID [21] UTF8String OPTIONAL,

replyApplicID [22] UTF8String OPTIONAL,

auxApplicInfo [23] UTF8String OPTIONAL,

contentClass [24] MMSContentClass OPTIONAL,

dRMContent [25] BOOLEAN OPTIONAL,

adaptationAllowed [26] MMSAdaptation OPTIONAL,

contentType [27] MMSContentType,

responseStatus [28] MMSResponseStatus,

responseStatusText [29] UTF8String OPTIONAL,

messageID [30] UTF8String

}

MMSSendByNonLocalTarget ::= SEQUENCE

{

version [1] MMSVersion,

transactionID [2] UTF8String,

messageID [3] UTF8String,

terminatingMMSParty [4] SEQUENCE OF MMSParty,

originatingMMSParty [5] MMSParty,

direction [6] MMSDirection,

contentType [7] MMSContentType,

messageClass [8] MMSMessageClass OPTIONAL,

dateTime [9] Timestamp,

expiry [10] MMSExpiry OPTIONAL,

deliveryReport [11] BOOLEAN OPTIONAL,

priority [12] MMSPriority OPTIONAL,

senderVisibility [13] BOOLEAN OPTIONAL,

readReport [14] BOOLEAN OPTIONAL,

subject [15] MMSSubject OPTIONAL,

forwardCount [16] INTEGER OPTIONAL,

previouslySentBy [17] MMSPreviouslySentBy OPTIONAL,

prevSentByDateTime [18] Timestamp OPTIONAL,

applicID [19] UTF8String OPTIONAL,

replyApplicID [20] UTF8String OPTIONAL,

auxApplicInfo [21] UTF8String OPTIONAL,

contentClass [22] MMSContentClass OPTIONAL,

dRMContent [23] BOOLEAN OPTIONAL,

adaptationAllowed [24] MMSAdaptation OPTIONAL

}

MMSNotification ::= SEQUENCE

{

transactionID [1] UTF8String,

version [2] MMSVersion,

originatingMMSParty [3] MMSParty OPTIONAL,

direction [4] MMSDirection,

subject [5] MMSSubject OPTIONAL,

deliveryReportRequested [6] BOOLEAN OPTIONAL,

stored [7] BOOLEAN OPTIONAL,

messageClass [8] MMSMessageClass,

priority [9] MMSPriority OPTIONAL,

messageSize [10] INTEGER,

expiry [11] MMSExpiry,

replyCharging [12] MMSReplyCharging OPTIONAL

}

MMSSendToNonLocalTarget ::= SEQUENCE

{

version [1] MMSVersion,

transactionID [2] UTF8String,

messageID [3] UTF8String,

terminatingMMSParty [4] SEQUENCE OF MMSParty,

originatingMMSParty [5] MMSParty,

direction [6] MMSDirection,

contentType [7] MMSContentType,

messageClass [8] MMSMessageClass OPTIONAL,

dateTime [9] Timestamp,

expiry [10] MMSExpiry OPTIONAL,

deliveryReport [11] BOOLEAN OPTIONAL,

priority [12] MMSPriority OPTIONAL,

senderVisibility [13] BOOLEAN OPTIONAL,

readReport [14] BOOLEAN OPTIONAL,

subject [15] MMSSubject OPTIONAL,

forwardCount [16] INTEGER OPTIONAL,

previouslySentBy [17] MMSPreviouslySentBy OPTIONAL,

prevSentByDateTime [18] Timestamp OPTIONAL,

applicID [19] UTF8String OPTIONAL,

replyApplicID [20] UTF8String OPTIONAL,

auxApplicInfo [21] UTF8String OPTIONAL,

contentClass [22] MMSContentClass OPTIONAL,

dRMContent [23] BOOLEAN OPTIONAL,

adaptationAllowed [24] MMSAdaptation OPTIONAL

}

MMSNotificationResponse ::= SEQUENCE

{

transactionID [1] UTF8String,

version [2] MMSVersion,

direction [3] MMSDirection,

status [4] MMStatus,

reportAllowed [5] BOOLEAN OPTIONAL

}

MMSRetrieval ::= SEQUENCE

{

transactionID [1] UTF8String,

version [2] MMSVersion,

messageID [3] UTF8String,

dateTime [4] Timestamp,

originatingMMSParty [5] MMSParty OPTIONAL,

previouslySentBy [6] MMSPreviouslySentBy OPTIONAL,

prevSentByDateTime [7] Timestamp OPTIONAL,

terminatingMMSParty [8] SEQUENCE OF MMSParty OPTIONAL,

cCRecipients [9] SEQUENCE OF MMSParty OPTIONAL,

direction [10] MMSDirection,

subject [11] MMSSubject OPTIONAL,

state [12] MMState OPTIONAL,

flags [13] MMFlags OPTIONAL,

messageClass [14] MMSMessageClass OPTIONAL,

priority [15] MMSPriority,

deliveryReport [16] BOOLEAN OPTIONAL,

readReport [17] BOOLEAN OPTIONAL,

replyCharging [18] MMSReplyCharging OPTIONAL,

retrieveStatus [19] MMSRetrieveStatus OPTIONAL,

retrieveStatusText [20] UTF8String OPTIONAL,

applicID [21] UTF8String OPTIONAL,

replyApplicID [22] UTF8String OPTIONAL,

auxApplicInfo [23] UTF8String OPTIONAL,

contentClass [24] MMSContentClass OPTIONAL,

dRMContent [25] BOOLEAN OPTIONAL,

replaceID [26] UTF8String OPTIONAL,

contentType [27] UTF8String OPTIONAL

}

MMSDeliveryAck ::= SEQUENCE

{

transactionID [1] UTF8String,

version [2] MMSVersion,

reportAllowed [3] BOOLEAN OPTIONAL,

status [4] MMStatus,

direction [5] MMSDirection

}

MMSForward ::= SEQUENCE

{

transactionID [1] UTF8String,

version [2] MMSVersion,

dateTime [3] Timestamp OPTIONAL,

originatingMMSParty [4] MMSParty,

terminatingMMSParty [5] SEQUENCE OF MMSParty OPTIONAL,

cCRecipients [6] SEQUENCE OF MMSParty OPTIONAL,

bCCRecipients [7] SEQUENCE OF MMSParty OPTIONAL,

direction [8] MMSDirection,

expiry [9] MMSExpiry OPTIONAL,

desiredDeliveryTime [10] Timestamp OPTIONAL,

deliveryReportAllowed [11] BOOLEAN OPTIONAL,

deliveryReport [12] BOOLEAN OPTIONAL,

store [13] BOOLEAN OPTIONAL,

state [14] MMState OPTIONAL,

flags [15] MMFlags OPTIONAL,

contentLocationReq [16] UTF8String,

replyCharging [17] MMSReplyCharging OPTIONAL,

responseStatus [18] MMSResponseStatus,

responseStatusText [19] UTF8String OPTIONAL,

messageID [20] UTF8String OPTIONAL,

contentLocationConf [21] UTF8String OPTIONAL,

storeStatus [22] MMSStoreStatus OPTIONAL,

storeStatusText [23] UTF8String OPTIONAL

}

MMSDeleteFromRelay ::= SEQUENCE

{

transactionID [1] UTF8String,

version [2] MMSVersion,

direction [3] MMSDirection,

contentLocationReq [4] SEQUENCE OF UTF8String,

contentLocationConf [5] SEQUENCE OF UTF8String,

deleteResponseStatus [6] MMSDeleteResponseStatus,

deleteResponseText [7] SEQUENCE OF UTF8String

}

MMSMBoxStore ::= SEQUENCE

{

transactionID [1] UTF8String,

version [2] MMSVersion,

direction [3] MMSDirection,

contentLocationReq [4] UTF8String,

state [5] MMState OPTIONAL,

flags [6] MMFlags OPTIONAL,

contentLocationConf [7] UTF8String OPTIONAL,

storeStatus [8] MMSStoreStatus,

storeStatusText [9] UTF8String OPTIONAL

}

MMSMBoxUpload ::= SEQUENCE

{

transactionID [1] UTF8String,

version [2] MMSVersion,

direction [3] MMSDirection,

state [4] MMState OPTIONAL,

flags [5] MMFlags OPTIONAL,

contentType [6] UTF8String,

contentLocation [7] UTF8String OPTIONAL,

storeStatus [8] MMSStoreStatus,

storeStatusText [9] UTF8String OPTIONAL,

mMessages [10] SEQUENCE OF MMBoxDescription

}

MMSMBoxDelete ::= SEQUENCE

{

transactionID [1] UTF8String,

version [2] MMSVersion,

direction [3] MMSDirection,

contentLocationReq [4] SEQUENCE OF UTF8String,

contentLocationConf [5] SEQUENCE OF UTF8String OPTIONAL,

responseStatus [6] MMSDeleteResponseStatus,

responseStatusText [7] UTF8String OPTIONAL

}

MMSDeliveryReport ::= SEQUENCE

{

version [1] MMSVersion,

messageID [2] UTF8String,

terminatingMMSParty [3] SEQUENCE OF MMSParty,

mMSDateTime [4] Timestamp,

responseStatus [5] MMSResponseStatus,

responseStatusText [6] UTF8String OPTIONAL,

applicID [7] UTF8String OPTIONAL,

replyApplicID [8] UTF8String OPTIONAL,

auxApplicInfo [9] UTF8String OPTIONAL

}

MMSDeliveryReportNonLocalTarget ::= SEQUENCE

{

version [1] MMSVersion,

transactionID [2] UTF8String,

messageID [3] UTF8String,

terminatingMMSParty [4] SEQUENCE OF MMSParty,

originatingMMSParty [5] MMSParty,

direction [6] MMSDirection,

mMSDateTime [7] Timestamp,

forwardToOriginator [8] BOOLEAN OPTIONAL,

status [9] MMStatus,

statusExtension [10] MMStatusExtension,

statusText [11] MMStatusText,

applicID [12] UTF8String OPTIONAL,

replyApplicID [13] UTF8String OPTIONAL,

auxApplicInfo [14] UTF8String OPTIONAL

}

MMSReadReport ::= SEQUENCE

{

version [1] MMSVersion,

messageID [2] UTF8String,

terminatingMMSParty [3] SEQUENCE OF MMSParty,

originatingMMSParty [4] SEQUENCE OF MMSParty,

direction [5] MMSDirection,

mMSDateTime [6] Timestamp,

readStatus [7] MMSReadStatus,

applicID [8] UTF8String OPTIONAL,

replyApplicID [9] UTF8String OPTIONAL,

auxApplicInfo [10] UTF8String OPTIONAL

}

MMSReadReportNonLocalTarget ::= SEQUENCE

{

version [1] MMSVersion,

transactionID [2] UTF8String,

terminatingMMSParty [3] SEQUENCE OF MMSParty,

originatingMMSParty [4] SEQUENCE OF MMSParty,

direction [5] MMSDirection,

messageID [6] UTF8String,

mMSDateTime [7] Timestamp,

readStatus [8] MMSReadStatus,

readStatusText [9] MMSReadStatusText OPTIONAL,

applicID [10] UTF8String OPTIONAL,

replyApplicID [11] UTF8String OPTIONAL,

auxApplicInfo [12] UTF8String OPTIONAL

}

MMSCancel ::= SEQUENCE

{

transactionID [1] UTF8String,

version [2] MMSVersion,

cancelID [3] UTF8String,

direction [4] MMSDirection

}

MMSMBoxViewRequest ::= SEQUENCE

{

transactionID [1] UTF8String,

version [2] MMSVersion,

contentLocation [3] UTF8String OPTIONAL,

state [4] SEQUENCE OF MMState OPTIONAL,

flags [5] SEQUENCE OF MMFlags OPTIONAL,

start [6] INTEGER OPTIONAL,

limit [7] INTEGER OPTIONAL,

attributes [8] SEQUENCE OF UTF8String OPTIONAL,

totals [9] INTEGER OPTIONAL,

quotas [10] MMSQuota OPTIONAL

}

MMSMBoxViewResponse ::= SEQUENCE

{

transactionID [1] UTF8String,

version [2] MMSVersion,

contentLocation [3] UTF8String OPTIONAL,

state [4] SEQUENCE OF MMState OPTIONAL,

flags [5] SEQUENCE OF MMFlags OPTIONAL,

start [6] INTEGER OPTIONAL,

limit [7] INTEGER OPTIONAL,

attributes [8] SEQUENCE OF UTF8String OPTIONAL,

mMSTotals [9] BOOLEAN OPTIONAL,

mMSQuotas [10] BOOLEAN OPTIONAL,

mMessages [11] SEQUENCE OF MMBoxDescription

}

MMBoxDescription ::= SEQUENCE

{

contentLocation [1] UTF8String OPTIONAL,

messageID [2] UTF8String OPTIONAL,

state [3] MMState OPTIONAL,

flags [4] SEQUENCE OF MMFlags OPTIONAL,

dateTime [5] Timestamp OPTIONAL,

originatingMMSParty [6] MMSParty OPTIONAL,

terminatingMMSParty [7] SEQUENCE OF MMSParty OPTIONAL,

cCRecipients [8] SEQUENCE OF MMSParty OPTIONAL,

bCCRecipients [9] SEQUENCE OF MMSParty OPTIONAL,

messageClass [10] MMSMessageClass OPTIONAL,

subject [11] MMSSubject OPTIONAL,

priority [12] MMSPriority OPTIONAL,

deliveryTime [13] Timestamp OPTIONAL,

readReport [14] BOOLEAN OPTIONAL,

messageSize [15] INTEGER OPTIONAL,

replyCharging [16] MMSReplyCharging OPTIONAL,

previouslySentBy [17] MMSPreviouslySentBy OPTIONAL,

previouslySentByDateTime [18] Timestamp OPTIONAL,

contentType [19] UTF8String OPTIONAL

}

-- =========

-- MMS CCPDU

-- =========

MMSCCPDU ::= SEQUENCE

{

version [1] MMSVersion,

transactionID [2] UTF8String,

mMSContent [3] OCTET STRING

}

-- ==============

-- MMS parameters

-- ==============

MMSAdaptation ::= SEQUENCE

{

allowed [1] BOOLEAN,

overriden [2] BOOLEAN

}

MMSCancelStatus ::= ENUMERATED

{

cancelRequestSuccessfullyReceived(1),

cancelRequestCorrupted(2)

}

MMSContentClass ::= ENUMERATED

{

text(1),

imageBasic(2),

imageRich(3),

videoBasic(4),

videoRich(5),

megaPixel(6),

contentBasic(7),

contentRich(8)

}

MMSContentType ::= UTF8String

MMSDeleteResponseStatus ::= ENUMERATED

{

ok(1),

errorUnspecified(2),

errorServiceDenied(3),

errorMessageFormatCorrupt(4),

errorSendingAddressUnresolved(5),

errorMessageNotFound(6),

errorNetworkProblem(7),

errorContentNotAccepted(8),

errorUnsupportedMessage(9),

errorTransientFailure(10),

errorTransientSendingAddressUnresolved(11),

errorTransientMessageNotFound(12),

errorTransientNetworkProblem(13),

errorTransientPartialSuccess(14),

errorPermanentFailure(15),

errorPermanentServiceDenied(16),

errorPermanentMessageFormatCorrupt(17),

errorPermanentSendingAddressUnresolved(18),

errorPermanentMessageNotFound(19),

errorPermanentContentNotAccepted(20),

errorPermanentReplyChargingLimitationsNotMet(21),

errorPermanentReplyChargingRequestNotAccepted(22),

errorPermanentReplyChargingForwardingDenied(23),

errorPermanentReplyChargingNotSupported(24),

errorPermanentAddressHidingNotSupported(25),

errorPermanentLackOfPrepaid(26)

}

MMSDirection ::= ENUMERATED

{

fromTarget(0),

toTarget(1)

}

MMSElementDescriptor ::= SEQUENCE

{

reference [1] UTF8String,

parameter [2] UTF8String OPTIONAL,

value [3] UTF8String OPTIONAL

}

MMSExpiry ::= SEQUENCE

{

expiryPeriod [1] INTEGER,

periodFormat [2] MMSPeriodFormat

}

MMFlags ::= SEQUENCE

{

length [1] INTEGER,

flag [2] MMStateFlag,

flagString [3] UTF8String

}

MMSMessageClass ::= ENUMERATED

{

personal(1),

advertisement(2),

informational(3),

auto(4)

}

MMSParty ::= SEQUENCE

{

mMSPartyIDs [1] SEQUENCE OF MMSPartyID,

nonLocalID [2] NonLocalID

}

MMSPartyID ::= CHOICE

{

e164Number [1] E164Number,

emailAddress [2] EmailAddress,

iMSI [3] IMSI,

iMPU [4] IMPU,

iMPI [5] IMPI,

sUPI [6] SUPI,

gPSI [7] GPSI

}

MMSPeriodFormat ::= ENUMERATED

{

absolute(1),

relative(2)

}

MMSPreviouslySent ::= SEQUENCE

{

previouslySentByParty [1] MMSParty,

sequenceNumber [2] INTEGER,

previousSendDateTime [3] Timestamp

}

MMSPreviouslySentBy ::= SEQUENCE OF MMSPreviouslySent

MMSPriority ::= ENUMERATED

{

low(1),

normal(2),

high(3)

}

MMSQuota ::= SEQUENCE

{

quota [1] INTEGER,

quotaUnit [2] MMSQuotaUnit

}

MMSQuotaUnit ::= ENUMERATED

{

numMessages(1),

bytes(2)

}

MMSReadStatus ::= ENUMERATED

{

read(1),

deletedWithoutBeingRead(2)

}

MMSReadStatusText ::= UTF8String

MMSReplyCharging ::= ENUMERATED

{

requested(0),

requestedTextOnly(1),

accepted(2),

acceptedTextOnly(3)

}

MMSResponseStatus ::= ENUMERATED

{

ok(1),

errorUnspecified(2),

errorServiceDenied(3),

errorMessageFormatCorrupt(4),

errorSendingAddressUnresolved(5),

errorMessageNotFound(6),

errorNetworkProblem(7),

errorContentNotAccepted(8),

errorUnsupportedMessage(9),

errorTransientFailure(10),

errorTransientSendingAddressUnresolved(11),

errorTransientMessageNotFound(12),

errorTransientNetworkProblem(13),

errorTransientPartialSuccess(14),

errorPermanentFailure(15),

errorPermanentServiceDenied(16),

errorPermanentMessageFormatCorrupt(17),

errorPermanentSendingAddressUnresolved(18),

errorPermanentMessageNotFound(19),

errorPermanentContentNotAccepted(20),

errorPermanentReplyChargingLimitationsNotMet(21),

errorPermanentReplyChargingRequestNotAccepted(22),

errorPermanentReplyChargingForwardingDenied(23),

errorPermanentReplyChargingNotSupported(24),

errorPermanentAddressHidingNotSupported(25),

errorPermanentLackOfPrepaid(26)

}

MMSRetrieveStatus ::= ENUMERATED

{

success(1),

errorTransientFailure(2),

errorTransientMessageNotFound(3),

errorTransientNetworkProblem(4),

errorPermanentFailure(5),

errorPermanentServiceDenied(6),

errorPermanentMessageNotFound(7),

errorPermanentContentUnsupported(8)

}

MMSStoreStatus ::= ENUMERATED

{

success(1),

errorTransientFailure(2),

errorTransientNetworkProblem(3),

errorPermanentFailure(4),

errorPermanentServiceDenied(5),

errorPermanentMessageFormatCorrupt(6),

errorPermanentMessageNotFound(7),

errorMMBoxFull(8)

}

MMState ::= ENUMERATED

{

draft(1),

sent(2),

new(3),

retrieved(4),

forwarded(5)

}

MMStateFlag ::= ENUMERATED

{

add(1),

remove(2),

filter(3)

}

MMStatus ::= ENUMERATED

{

expired(1),

retrieved(2),

rejected(3),

deferred(4),

unrecognized(5),

indeterminate(6),

forwarded(7),

unreachable(8)

}

MMStatusExtension ::= ENUMERATED

{

rejectionByMMSRecipient(0),

rejectionByOtherRS(1)

}

MMStatusText ::= UTF8String

MMSSubject ::= UTF8String

MMSVersion ::= SEQUENCE

{

majorVersion [1] INTEGER,

minorVersion [2] INTEGER

}

-- ==================

-- 5G PTC definitions

-- ==================

PTCRegistration ::= SEQUENCE

{

pTCTargetInformation [1] PTCTargetInformation,

pTCServerURI [2] UTF8String,

pTCRegistrationRequest [3] PTCRegistrationRequest,

pTCRegistrationOutcome [4] PTCRegistrationOutcome

}

PTCSessionInitiation ::= SEQUENCE

{

pTCTargetInformation [1] PTCTargetInformation,

pTCDirection [2] Direction,

pTCServerURI [3] UTF8String,

pTCSessionInfo [4] PTCSessionInfo,

pTCOriginatingID [5] PTCTargetInformation,

pTCParticipants [6] SEQUENCE OF PTCTargetInformation OPTIONAL,

pTCParticipantPresenceStatus [7] MultipleParticipantPresenceStatus OPTIONAL,

location [8] Location OPTIONAL,

pTCBearerCapability [9] UTF8String OPTIONAL,

pTCHost [10] PTCTargetInformation OPTIONAL

}

PTCSessionAbandon ::= SEQUENCE

{

pTCTargetInformation [1] PTCTargetInformation,

pTCDirection [2] Direction,

pTCSessionInfo [3] PTCSessionInfo,

location [4] Location OPTIONAL,

pTCAbandonCause [5] INTEGER

}

PTCSessionStart ::= SEQUENCE

{

pTCTargetInformation [1] PTCTargetInformation,

pTCDirection [2] Direction,

pTCServerURI [3] UTF8String,

pTCSessionInfo [4] PTCSessionInfo,

pTCOriginatingID [5] PTCTargetInformation,

pTCParticipants [6] SEQUENCE OF PTCTargetInformation OPTIONAL,

pTCParticipantPresenceStatus [7] MultipleParticipantPresenceStatus OPTIONAL,

location [8] Location OPTIONAL,

pTCHost [9] PTCTargetInformation OPTIONAL,

pTCBearerCapability [10] UTF8String OPTIONAL

}

PTCSessionEnd ::= SEQUENCE

{

pTCTargetInformation [1] PTCTargetInformation,

pTCDirection [2] Direction,

pTCServerURI [3] UTF8String,

pTCSessionInfo [4] PTCSessionInfo,

pTCParticipants [5] SEQUENCE OF PTCTargetInformation OPTIONAL,

location [6] Location OPTIONAL,

pTCSessionEndCause [7] PTCSessionEndCause

}

PTCStartOfInterception ::= SEQUENCE

{

pTCTargetInformation [1] PTCTargetInformation,

pTCDirection [2] Direction,

preEstSessionID [3] PTCSessionInfo OPTIONAL,

pTCOriginatingID [4] PTCTargetInformation,

pTCSessionInfo [5] PTCSessionInfo OPTIONAL,

pTCHost [6] PTCTargetInformation OPTIONAL,

pTCParticipants [7] SEQUENCE OF PTCTargetInformation OPTIONAL,

pTCMediaStreamAvail [8] BOOLEAN OPTIONAL,

pTCBearerCapability [9] UTF8String OPTIONAL

}

PTCPreEstablishedSession ::= SEQUENCE

{

pTCTargetInformation [1] PTCTargetInformation,

pTCServerURI [2] UTF8String,

rTPSetting [3] RTPSetting,

pTCMediaCapability [4] UTF8String,

pTCPreEstSessionID [5] PTCSessionInfo,

pTCPreEstStatus [6] PTCPreEstStatus,

pTCMediaStreamAvail [7] BOOLEAN OPTIONAL,

location [8] Location OPTIONAL,

pTCFailureCode [9] PTCFailureCode OPTIONAL

}

PTCInstantPersonalAlert ::= SEQUENCE

{

pTCTargetInformation [1] PTCTargetInformation,

pTCIPAPartyID [2] PTCTargetInformation,

pTCIPADirection [3] Direction

}

PTCPartyJoin ::= SEQUENCE

{

pTCTargetInformation [1] PTCTargetInformation,

pTCDirection [2] Direction,

pTCSessionInfo [3] PTCSessionInfo,

pTCParticipants [4] SEQUENCE OF PTCTargetInformation OPTIONAL,

pTCParticipantPresenceStatus [5] MultipleParticipantPresenceStatus OPTIONAL,

pTCMediaStreamAvail [6] BOOLEAN OPTIONAL,

pTCBearerCapability [7] UTF8String OPTIONAL

}

PTCPartyDrop ::= SEQUENCE

{

pTCTargetInformation [1] PTCTargetInformation,

pTCDirection [2] Direction,

pTCSessionInfo [3] PTCSessionInfo,

pTCPartyDrop [4] PTCTargetInformation,

pTCParticipantPresenceStatus [5] PTCParticipantPresenceStatus OPTIONAL

}

PTCPartyHold ::= SEQUENCE

{

pTCTargetInformation [1] PTCTargetInformation,

pTCDirection [2] Direction,

pTCSessionInfo [3] PTCSessionInfo,

pTCParticipants [4] SEQUENCE OF PTCTargetInformation OPTIONAL,

pTCHoldID [5] SEQUENCE OF PTCTargetInformation,

pTCHoldRetrieveInd [6] BOOLEAN

}

PTCMediaModification ::= SEQUENCE

{

pTCTargetInformation [1] PTCTargetInformation,

pTCDirection [2] Direction,

pTCSessionInfo [3] PTCSessionInfo,

pTCMediaStreamAvail [4] BOOLEAN OPTIONAL,

pTCBearerCapability [5] UTF8String

}

PTCGroupAdvertisement ::=SEQUENCE

{

pTCTargetInformation [1] PTCTargetInformation,

pTCDirection [2] Direction,

pTCIDList [3] SEQUENCE OF PTCTargetInformation OPTIONAL,

pTCGroupAuthRule [4] PTCGroupAuthRule OPTIONAL,

pTCGroupAdSender [5] PTCTargetInformation,

pTCGroupNickname [6] UTF8String OPTIONAL

}

PTCFloorControl ::= SEQUENCE

{

pTCTargetInformation [1] PTCTargetInformation,

pTCDirection [2] Direction,

pTCSessioninfo [3] PTCSessionInfo,

pTCFloorActivity [4] SEQUENCE OF PTCFloorActivity,

pTCFloorSpeakerID [5] PTCTargetInformation OPTIONAL,

pTCMaxTBTime [6] INTEGER OPTIONAL,

pTCQueuedFloorControl [7] BOOLEAN OPTIONAL,

pTCQueuedPosition [8] INTEGER OPTIONAL,

pTCTalkBurstPriority [9] PTCTBPriorityLevel OPTIONAL,

pTCTalkBurstReason [10] PTCTBReasonCode OPTIONAL

}

PTCTargetPresence ::= SEQUENCE

{

pTCTargetInformation [1] PTCTargetInformation,

pTCTargetPresenceStatus [2] PTCParticipantPresenceStatus

}

PTCParticipantPresence ::= SEQUENCE

{

pTCTargetInformation [1] PTCTargetInformation,

pTCParticipantPresenceStatus [2] PTCParticipantPresenceStatus

}

PTCListManagement ::= SEQUENCE

{

pTCTargetInformation [1] PTCTargetInformation,

pTCDirection [2] Direction,

pTCListManagementType [3] PTCListManagementType OPTIONAL,

pTCListManagementAction [4] PTCListManagementAction OPTIONAL,

pTCListManagementFailure [5] PTCListManagementFailure OPTIONAL,

pTCContactID [6] PTCTargetInformation OPTIONAL,

pTCIDList [7] SEQUENCE OF PTCIDList OPTIONAL,

pTCHost [8] PTCTargetInformation OPTIONAL

}

PTCAccessPolicy ::= SEQUENCE

{

pTCTargetInformation [1] PTCTargetInformation,

pTCDirection [2] Direction,

pTCAccessPolicyType [3] PTCAccessPolicyType OPTIONAL,

pTCUserAccessPolicy [4] PTCUserAccessPolicy OPTIONAL,

pTCGroupAuthRule [5] PTCGroupAuthRule OPTIONAL,

pTCContactID [6] PTCTargetInformation OPTIONAL,

pTCAccessPolicyFailure [7] PTCAccessPolicyFailure OPTIONAL

}

-- =========

-- PTC CCPDU

-- =========

PTCCCPDU ::= OCTET STRING

-- =================

-- 5G PTC parameters

-- =================

PTCRegistrationRequest ::= ENUMERATED

{

register(1),

reRegister(2),

deRegister(3)

}

PTCRegistrationOutcome ::= ENUMERATED

{

success(1),

failure(2)

}

PTCSessionEndCause ::= ENUMERATED

{

initiaterLeavesSession(1),

definedParticipantLeaves(2),

numberOfParticipants(3),

sessionTimerExpired(4),

pTCSpeechInactive(5),

allMediaTypesInactive(6)

}

PTCTargetInformation ::= SEQUENCE

{

identifiers [1] SEQUENCE SIZE(1..MAX) OF PTCIdentifiers

}

PTCIdentifiers ::= CHOICE

{

mCPTTID [1] UTF8String,

instanceIdentifierURN [2] UTF8String,

pTCChatGroupID [3] PTCChatGroupID,

iMPU [4] IMPU,

iMPI [5] IMPI

}

PTCSessionInfo ::= SEQUENCE

{

pTCSessionURI [1] UTF8String,

pTCSessionType [2] PTCSessionType

}

PTCSessionType ::= ENUMERATED

{

ondemand(1),

preEstablished(2),

adhoc(3),

prearranged(4),

groupSession(5)

}

MultipleParticipantPresenceStatus ::= SEQUENCE OF PTCParticipantPresenceStatus

PTCParticipantPresenceStatus ::= SEQUENCE

{

presenceID [1] PTCTargetInformation,

presenceType [2] PTCPresenceType,

presenceStatus [3] BOOLEAN

}

PTCPresenceType ::= ENUMERATED

{

pTCClient(1),

pTCGroup(2)

}

PTCPreEstStatus ::= ENUMERATED

{

established(1),

modified(2),

released(3)

}

RTPSetting ::= SEQUENCE

{

iPAddress [1] IPAddress,

portNumber [2] PortNumber

}

PTCIDList ::= SEQUENCE

{

pTCPartyID [1] PTCTargetInformation,

pTCChatGroupID [2] PTCChatGroupID

}

PTCChatGroupID ::= SEQUENCE

{

groupIdentity [1] UTF8String

}

PTCFloorActivity ::= ENUMERATED

{

tBCPRequest(1),

tBCPGranted(2),

tBCPDeny(3),

tBCPIdle(4),

tBCPTaken(5),

tBCPRevoke(6),

tBCPQueued(7),

tBCPRelease(8)

}

PTCTBPriorityLevel ::= ENUMERATED

{

preEmptive(1),

highPriority(2),

normalPriority(3),

listenOnly(4)

}

PTCTBReasonCode ::= ENUMERATED

{

noQueuingAllowed(1),

oneParticipantSession(2),

listenOnly(3),

exceededMaxDuration(4),

tBPrevented(5)

}

PTCListManagementType ::= ENUMERATED

{

contactListManagementAttempt(1),

groupListManagementAttempt(2),

contactListManagementResult(3),

groupListManagementResult(4),

requestUnsuccessful(5)

}

PTCListManagementAction ::= ENUMERATED

{

create(1),

modify(2),

retrieve(3),

delete(4),

notify(5)

}

PTCAccessPolicyType ::= ENUMERATED

{

pTCUserAccessPolicyAttempt(1),

groupAuthorizationRulesAttempt(2),

pTCUserAccessPolicyQuery(3),

groupAuthorizationRulesQuery(4),

pTCUserAccessPolicyResult(5),

groupAuthorizationRulesResult(6),

requestUnsuccessful(7)

}

PTCUserAccessPolicy ::= ENUMERATED

{

allowIncomingPTCSessionRequest(1),

blockIncomingPTCSessionRequest(2),

allowAutoAnswerMode(3),

allowOverrideManualAnswerMode(4)

}

PTCGroupAuthRule ::= ENUMERATED

{

allowInitiatingPTCSession(1),

blockInitiatingPTCSession(2),

allowJoiningPTCSession(3),

blockJoiningPTCSession(4),

allowAddParticipants(5),

blockAddParticipants(6),

allowSubscriptionPTCSessionState(7),

blockSubscriptionPTCSessionState(8),

allowAnonymity(9),

forbidAnonymity(10)

}

PTCFailureCode ::= ENUMERATED

{

sessionCannotBeEstablished(1),

sessionCannotBeModified(2)

}

PTCListManagementFailure ::= ENUMERATED

{

requestUnsuccessful(1),

requestUnknown(2)

}

PTCAccessPolicyFailure ::= ENUMERATED

{

requestUnsuccessful(1),

requestUnknown(2)

}

-- ===============

-- IMS definitions

-- ===============

-- See clause 7.12.4.2.1 for details of this structure

IMSMessage ::= SEQUENCE

{

payload [1] IMSPayload,

sessionDirection [2] SessionDirection,

voIPRoamingIndication [3] VoIPRoamingIndication OPTIONAL,

location [6] Location OPTIONAL

}

-- See clause 7.12.4.2.2 for details of this structure

StartOfInterceptionForActiveIMSSession ::= SEQUENCE

{

originatingId [1] SEQUENCE OF IMPU,

terminatingId [2] IMPU,

sDPState [3] SEQUENCE OF OCTET STRING OPTIONAL,

diversionIdentity [4] IMPU OPTIONAL,

voIPRoamingIndication [5] VoIPRoamingIndication OPTIONAL,

location [7] Location OPTIONAL

}

-- See clause 7.12.4.2.3 for the details.

IMSCCUnavailable ::= SEQUENCE

{

cCUnavailableReason [1] UTF8String,

sDPState [2] OCTET STRING OPTIONAL

}

-- ==============

-- IMS parameters

-- ==============

IMSPayload ::= CHOICE

{

encapsulatedSIPMessage [1] SIPMessage

}

SIPMessage ::= SEQUENCE

{

iPSourceAddress [1] IPAddress,

iPDestinationAddress [2] IPAddress,

sIPContent [3] OCTET STRING

}

VoIPRoamingIndication ::= ENUMERATED

{

roamingLBO(1),

roamingS8HR(2),

roamingN9HR(3)

}

SessionDirection ::= ENUMERATED

{

fromTarget(1),

toTarget(2),

combined(3),

indeterminate(4)

}

HeaderOnlyIndication ::= BOOLEAN

-- =================================

-- STIR/SHAKEN/RCD/eCNAM definitions

-- =================================

-- See clause 7.11.2.1.2 for details of this structure

STIRSHAKENSignatureGeneration ::= SEQUENCE

{

pASSporTs [1] SEQUENCE OF PASSporT,

encapsulatedSIPMessage [2] SIPMessage OPTIONAL

}

-- See clause 7.11.2.1.3 for details of this structure

STIRSHAKENSignatureValidation ::= SEQUENCE

{

pASSporTs [1] SEQUENCE OF PASSporT OPTIONAL,

rCDTerminalDisplayInfo [2] RCDDisplayInfo OPTIONAL,

eCNAMTerminalDisplayInfo [3] ECNAMDisplayInfo OPTIONAL,

sHAKENValidationResult [4] SHAKENValidationResult,

sHAKENFailureStatusCode [5] SHAKENFailureStatusCode OPTIONAL,

encapsulatedSIPMessage [6] SIPMessage OPTIONAL

}

-- ================================

-- STIR/SHAKEN/RCD/eCNAM parameters

-- ================================

PASSporT ::= SEQUENCE

{

pASSporTHeader [1] PASSporTHeader,

pASSporTPayload [2] PASSporTPayload,

pASSporTSignature [3] OCTET STRING

}

PASSporTHeader ::= SEQUENCE

{

type [1] JWSTokenType,

algorithm [2] UTF8String,

ppt [3] UTF8String OPTIONAL,

x5u [4] UTF8String

}

JWSTokenType ::= ENUMERATED

{

passport(1)

}

PASSporTPayload ::= SEQUENCE

{

issuedAtTime [1] GeneralizedTime,

originator [2] STIRSHAKENOriginator,

destination [3] STIRSHAKENDestinations,

attestation [4] Attestation,

origId [5] UTF8String,

diversion [6] STIRSHAKENDestination

}

STIRSHAKENOriginator ::= CHOICE

{

telephoneNumber [1] STIRSHAKENTN,

sTIRSHAKENURI [2] UTF8String

}

STIRSHAKENDestinations ::= SEQUENCE OF STIRSHAKENDestination

STIRSHAKENDestination ::= CHOICE

{

telephoneNumber [1] STIRSHAKENTN,

sTIRSHAKENURI [2] UTF8String

}

STIRSHAKENTN ::= CHOICE

{

mSISDN [1] MSISDN

}

Attestation ::= ENUMERATED

{

attestationA(1),

attestationB(2),

attestationC(3)

}

SHAKENValidationResult ::= ENUMERATED

{

tNValidationPassed(1),

tNValidationFailed(2),

noTNValidation(3)

}

SHAKENFailureStatusCode ::= INTEGER

ECNAMDisplayInfo ::= SEQUENCE

{

name [1] UTF8String,

additionalInfo [2] OCTET STRING OPTIONAL

}

RCDDisplayInfo ::= SEQUENCE

{

name [1] UTF8String,

jcd [2] OCTET STRING OPTIONAL,

jcl [3] OCTET STRING OPTIONAL

}

-- ===================

-- 5G LALS definitions

-- ===================

LALSReport ::= SEQUENCE

{

sUPI [1] SUPI OPTIONAL,

-- pEI [2] PEI OPTIONAL, deprecated in Release-16, do not re-use this tag number

gPSI [3] GPSI OPTIONAL,

location [4] Location OPTIONAL,

iMPU [5] IMPU OPTIONAL,

iMSI [7] IMSI OPTIONAL,

mSISDN [8] MSISDN OPTIONAL

}

-- =====================

-- PDHR/PDSR definitions

-- =====================

PDHeaderReport ::= SEQUENCE

{

pDUSessionID [1] PDUSessionID,

sourceIPAddress [2] IPAddress,

sourcePort [3] PortNumber OPTIONAL,

destinationIPAddress [4] IPAddress,

destinationPort [5] PortNumber OPTIONAL,

nextLayerProtocol [6] NextLayerProtocol,

iPv6flowLabel [7] IPv6FlowLabel OPTIONAL,

direction [8] Direction,

packetSize [9] INTEGER

}

PDSummaryReport ::= SEQUENCE

{

pDUSessionID [1] PDUSessionID,

sourceIPAddress [2] IPAddress,

sourcePort [3] PortNumber OPTIONAL,

destinationIPAddress [4] IPAddress,

destinationPort [5] PortNumber OPTIONAL,

nextLayerProtocol [6] NextLayerProtocol,

iPv6flowLabel [7] IPv6FlowLabel OPTIONAL,

direction [8] Direction,

pDSRSummaryTrigger [9] PDSRSummaryTrigger,

firstPacketTimestamp [10] Timestamp,

lastPacketTimestamp [11] Timestamp,

packetCount [12] INTEGER,

byteCount [13] INTEGER

}

-- ====================

-- PDHR/PDSR parameters

-- ====================

PDSRSummaryTrigger ::= ENUMERATED

{

timerExpiry(1),

packetCount(2),

byteCount(3),

startOfFlow(4),

endOfFlow(5)

}

-- ==================================

-- Identifier Association definitions

-- ==================================

AMFIdentifierAssociation ::= SEQUENCE

{

sUPI [1] SUPI,

sUCI [2] SUCI OPTIONAL,

pEI [3] PEI OPTIONAL,

gPSI [4] GPSI OPTIONAL,

gUTI [5] FiveGGUTI,

location [6] Location,

fiveGSTAIList [7] TAIList OPTIONAL

}

MMEIdentifierAssociation ::= SEQUENCE

{

iMSI [1] IMSI,

iMEI [2] IMEI OPTIONAL,

mSISDN [3] MSISDN OPTIONAL,

gUTI [4] GUTI,

location [5] Location,

tAIList [6] TAIList OPTIONAL

}

-- =================================

-- Identifier Association parameters

-- =================================

MMEGroupID ::= OCTET STRING (SIZE(2))

MMECode ::= OCTET STRING (SIZE(1))

TMSI ::= OCTET STRING (SIZE(4))

-- ===================

-- EPS MME definitions

-- ===================

MMEAttach ::= SEQUENCE

{

attachType [1] EPSAttachType,

attachResult [2] EPSAttachResult,

iMSI [3] IMSI,

iMEI [4] IMEI OPTIONAL,

mSISDN [5] MSISDN OPTIONAL,

gUTI [6] GUTI OPTIONAL,

location [7] Location OPTIONAL,

ePSTAIList [8] TAIList OPTIONAL,

sMSServiceStatus [9] EPSSMSServiceStatus OPTIONAL,

oldGUTI [10] GUTI OPTIONAL,

eMM5GRegStatus [11] EMM5GMMStatus OPTIONAL

}

MMEDetach ::= SEQUENCE

{

detachDirection [1] MMEDirection,

detachType [2] EPSDetachType,

iMSI [3] IMSI,

iMEI [4] IMEI OPTIONAL,

mSISDN [5] MSISDN OPTIONAL,

gUTI [6] GUTI OPTIONAL,

cause [7] EMMCause OPTIONAL,

location [8] Location OPTIONAL,

switchOffIndicator [9] SwitchOffIndicator OPTIONAL

}

MMELocationUpdate ::= SEQUENCE

{

iMSI [1] IMSI,

iMEI [2] IMEI OPTIONAL,

mSISDN [3] MSISDN OPTIONAL,

gUTI [4] GUTI OPTIONAL,

location [5] Location OPTIONAL,

oldGUTI [6] GUTI OPTIONAL,

sMSServiceStatus [7] EPSSMSServiceStatus OPTIONAL

}

MMEStartOfInterceptionWithEPSAttachedUE ::= SEQUENCE

{

attachType [1] EPSAttachType,

attachResult [2] EPSAttachResult,

iMSI [3] IMSI,

iMEI [4] IMEI OPTIONAL,

mSISDN [5] MSISDN OPTIONAL,

gUTI [6] GUTI OPTIONAL,

location [7] Location OPTIONAL,

ePSTAIList [9] TAIList OPTIONAL,

sMSServiceStatus [10] EPSSMSServiceStatus OPTIONAL,

eMM5GRegStatus [12] EMM5GMMStatus OPTIONAL

}

MMEUnsuccessfulProcedure ::= SEQUENCE

{

failedProcedureType [1] MMEFailedProcedureType,

failureCause [2] MMEFailureCause,

iMSI [3] IMSI OPTIONAL,

iMEI [4] IMEI OPTIONAL,

mSISDN [5] MSISDN OPTIONAL,

gUTI [6] GUTI OPTIONAL,

location [7] Location OPTIONAL

}

-- See clause 6.3.2.2.8 for details of this structure

MMEPositioningInfoTransfer ::= SEQUENCE

{

iMSI [1] IMSI,

iMEI [2] IMEI OPTIONAL,

mSISDN [3] MSISDN OPTIONAL,

gUTI [4] GUTI OPTIONAL,

lPPaMessage [5] OCTET STRING OPTIONAL,

lPPMessage [6] OCTET STRING OPTIONAL,

mMELCSCorrelationId [7] OCTET STRING (SIZE(4))

}

-- ==================

-- EPS MME parameters

-- ==================

EMMCause ::= INTEGER (0..255)

ESMCause ::= INTEGER (0..255)

EPSAttachType ::= ENUMERATED

{

ePSAttach(1),

combinedEPSIMSIAttach(2),

ePSRLOSAttach(3),

ePSEmergencyAttach(4),

reserved(5)

}

EPSAttachResult ::= ENUMERATED

{

ePSOnly(1),

combinedEPSIMSI(2)

}

EPSDetachType ::= ENUMERATED

{

ePSDetach(1),

iMSIDetach(2),

combinedEPSIMSIDetach(3),

reAttachRequired(4),

reAttachNotRequired(5),

reserved(6)

}

EPSSMSServiceStatus ::= ENUMERATED

{

sMSServicesNotAvailable(1),

sMSServicesNotAvailableInThisPLMN(2),

networkFailure(3),

congestion(4)

}

MMEDirection ::= ENUMERATED

{

networkInitiated(1),

uEInitiated(2)

}

MMEFailedProcedureType ::= ENUMERATED

{

attachReject(1),

authenticationReject(2),

securityModeReject(3),

serviceReject(4),

trackingAreaUpdateReject(5),

activateDedicatedEPSBearerContextReject(6),

activateDefaultEPSBearerContextReject(7),

bearerResourceAllocationReject(8),

bearerResourceModificationReject(9),

modifyEPSBearerContectReject(10),

pDNConnectivityReject(11),

pDNDisconnectReject(12)

}

MMEFailureCause ::= CHOICE

{

eMMCause [1] EMMCause,

eSMCause [2] ESMCause

}

-- ===========================

-- LI Notification definitions

-- ===========================

LINotification ::= SEQUENCE

{

notificationType [1] LINotificationType,

appliedTargetID [2] TargetIdentifier OPTIONAL,

appliedDeliveryInformation [3] SEQUENCE OF LIAppliedDeliveryInformation OPTIONAL,

appliedStartTime [4] Timestamp OPTIONAL,

appliedEndTime [5] Timestamp OPTIONAL

}

-- ==========================

-- LI Notification parameters

-- ==========================

LINotificationType ::= ENUMERATED

{

activation(1),

deactivation(2),

modification(3)

}

LIAppliedDeliveryInformation ::= SEQUENCE

{

hI2DeliveryIPAddress [1] IPAddress OPTIONAL,

hI2DeliveryPortNumber [2] PortNumber OPTIONAL,

hI3DeliveryIPAddress [3] IPAddress OPTIONAL,

hI3DeliveryPortNumber [4] PortNumber OPTIONAL

}

-- ===============

-- MDF definitions

-- ===============

MDFCellSiteReport ::= SEQUENCE OF CellInformation

-- ==============================

-- 5G EPS Interworking Parameters

-- ==============================

EMM5GMMStatus ::= SEQUENCE

{

eMMRegStatus [1] EMMRegStatus OPTIONAL,

fiveGMMStatus [2] FiveGMMStatus OPTIONAL

}

EPS5GGUTI ::= CHOICE

{

gUTI [1] GUTI,

fiveGGUTI [2] FiveGGUTI

}

EMMRegStatus ::= ENUMERATED

{

uEEMMRegistered(1),

uENotEMMRegistered(2)

}

FiveGMMStatus ::= ENUMERATED

{

uE5GMMRegistered(1),

uENot5GMMRegistered(2)

}

-- ========================================

-- Separated Location Reporting definitions

-- ========================================

SeparatedLocationReporting ::= SEQUENCE

{

sUPI [1] SUPI,

sUCI [2] SUCI OPTIONAL,

pEI [3] PEI OPTIONAL,

gPSI [4] GPSI OPTIONAL,

gUTI [5] FiveGGUTI OPTIONAL,

location [6] Location,

non3GPPAccessEndpoint [7] UEEndpointAddress OPTIONAL,

rATType [8] RATType OPTIONAL

}

-- =================

-- Common Parameters

-- =================

AccessType ::= ENUMERATED

{

threeGPPAccess(1),

nonThreeGPPAccess(2),

threeGPPandNonThreeGPPAccess(3)

}

Direction ::= ENUMERATED

{

fromTarget(1),

toTarget(2)

}

DNN ::= UTF8String

E164Number ::= NumericString (SIZE(1..15))

EmailAddress ::= UTF8String

EUI64 ::= OCTET STRING (SIZE(8))

FiveGGUTI ::= SEQUENCE

{

mCC [1] MCC,

mNC [2] MNC,

aMFRegionID [3] AMFRegionID,

aMFSetID [4] AMFSetID,

aMFPointer [5] AMFPointer,

fiveGTMSI [6] FiveGTMSI

}

FiveGMMCause ::= INTEGER (0..255)

FiveGSMRequestType ::= ENUMERATED

{

initialRequest(1),

existingPDUSession(2),

initialEmergencyRequest(3),

existingEmergencyPDUSession(4),

modificationRequest(5),

reserved(6),

mAPDURequest(7)

}

FiveGSMCause ::= INTEGER (0..255)

FiveGTMSI ::= INTEGER (0..4294967295)

FiveGSRVCCInfo ::= SEQUENCE

{

uE5GSRVCCCapability [1] BOOLEAN,

sessionTransferNumber [2] UTF8String OPTIONAL,

correlationMSISDN [3] MSISDN OPTIONAL

}

FiveGSUserStateInfo ::= SEQUENCE

{

fiveGSUserState [1] FiveGSUserState,

accessType [2] AccessType

}

FiveGSUserState ::= ENUMERATED

{

deregistered(1),

registeredNotReachableForPaging(2),

registeredReachableForPaging(3),

connectedNotReachableForPaging(4),

connectedReachableForPaging(5),

notProvidedFromAMF(6)

}

FTEID ::= SEQUENCE

{

tEID [1] INTEGER (0.. 4294967295),

iPv4Address [2] IPv4Address OPTIONAL,

iPv6Address [3] IPv6Address OPTIONAL

}

GPSI ::= CHOICE

{

mSISDN [1] MSISDN,

nAI [2] NAI

}

GUAMI ::= SEQUENCE

{

aMFID [1] AMFID,

pLMNID [2] PLMNID

}

GUMMEI ::= SEQUENCE

{

mMEID [1] MMEID,

mCC [2] MCC,

mNC [3] MNC

}

GUTI ::= SEQUENCE

{

mCC [1] MCC,

mNC [2] MNC,

mMEGroupID [3] MMEGroupID,

mMECode [4] MMECode,

mTMSI [5] TMSI

}

HomeNetworkPublicKeyID ::= OCTET STRING

HSMFURI ::= UTF8String

IMEI ::= NumericString (SIZE(14))

IMEISV ::= NumericString (SIZE(16))

IMPI ::= NAI

IMPU ::= CHOICE

{

sIPURI [1] SIPURI,

tELURI [2] TELURI

}

IMSI ::= NumericString (SIZE(6..15))

Initiator ::= ENUMERATED

{

uE(1),

network(2),

unknown(3)

}

IPAddress ::= CHOICE

{

iPv4Address [1] IPv4Address,

iPv6Address [2] IPv6Address

}

IPv4Address ::= OCTET STRING (SIZE(4))

IPv6Address ::= OCTET STRING (SIZE(16))

IPv6FlowLabel ::= INTEGER(0..1048575)

MACAddress ::= OCTET STRING (SIZE(6))

MACRestrictionIndicator ::= ENUMERATED

{

noResrictions(1),

mACAddressNotUseableAsEquipmentIdentifier(2),

unknown(3)

}

MCC ::= NumericString (SIZE(3))

MNC ::= NumericString (SIZE(2..3))

MMEID ::= SEQUENCE

{

mMEGI [1] MMEGI,

mMEC [2] MMEC

}

MMEC ::= NumericString

MMEGI ::= NumericString

MSISDN ::= NumericString (SIZE(1..15))

NAI ::= UTF8String

NextLayerProtocol ::= INTEGER(0..255)

NonLocalID ::= ENUMERATED

{

local(1),

nonLocal(2)

}

NonIMEISVPEI ::= CHOICE

{

mACAddress [1] MACAddress

}

NSSAI ::= SEQUENCE OF SNSSAI

PLMNID ::= SEQUENCE

{

mCC [1] MCC,

mNC [2] MNC

}

PDUSessionID ::= INTEGER (0..255)

PDUSessionType ::= ENUMERATED

{

iPv4(1),

iPv6(2),

iPv4v6(3),

unstructured(4),

ethernet(5)

}

PEI ::= CHOICE

{

iMEI [1] IMEI,

iMEISV [2] IMEISV,

mACAddress [3] MACAddress,

eUI64 [4] EUI64

}

PortNumber ::= INTEGER(0..65535)

PrimaryAuthenticationType ::= ENUMERATED

{

eAPAKAPrime(1),

fiveGAKA(2),

eAPTLS(3),

none(4),

ePSAKA(5),

eAPAKA(6),

iMSAKA(7),

gBAAKA(8),

uMTSAKA(9)

}

ProtectionSchemeID ::= INTEGER (0..15)

RATType ::= ENUMERATED

{

nR(1),

eUTRA(2),

wLAN(3),

virtual(4),

nBIOT(5),

wireline(6),

wirelineCable(7),

wirelineBBF(8),

lTEM(9),

nRU(10),

eUTRAU(11),

trustedN3GA(12),

trustedWLAN(13),

uTRA(14),

gERA(15),

nRLEO(16),

nRMEO(17),

nRGEO(18),

nROTHERSAT(19),

nRREDCAP(20)

}

RejectedNSSAI ::= SEQUENCE OF RejectedSNSSAI

RejectedSNSSAI ::= SEQUENCE

{

causeValue [1] RejectedSliceCauseValue,

sNSSAI [2] SNSSAI

}

RejectedSliceCauseValue ::= INTEGER (0..255)

ReRegRequiredIndicator ::= ENUMERATED

{

reRegistrationRequired(1),

reRegistrationNotRequired(2)

}

RoutingIndicator ::= INTEGER (0..9999)

SchemeOutput ::= OCTET STRING

SIPURI ::= UTF8String

Slice ::= SEQUENCE

{

allowedNSSAI [1] NSSAI OPTIONAL,

configuredNSSAI [2] NSSAI OPTIONAL,

rejectedNSSAI [3] RejectedNSSAI OPTIONAL

}

SMPDUDNRequest ::= OCTET STRING

-- TS 24.501 [13], clause 9.11.3.6.1

SMSOverNASIndicator ::= ENUMERATED

{

sMSOverNASNotAllowed(1),

sMSOverNASAllowed(2)

}

SNSSAI ::= SEQUENCE

{

sliceServiceType [1] INTEGER (0..255),

sliceDifferentiator [2] OCTET STRING (SIZE(3)) OPTIONAL

}

SubscriberIdentifier ::= CHOICE

{

sUCI [1] SUCI,

sUPI [2] SUPI

}

SUCI ::= SEQUENCE

{

mCC [1] MCC,

mNC [2] MNC,

routingIndicator [3] RoutingIndicator,

protectionSchemeID [4] ProtectionSchemeID,

homeNetworkPublicKeyID [5] HomeNetworkPublicKeyID,

schemeOutput [6] SchemeOutput,

routingIndicatorLength [7] INTEGER (1..4) OPTIONAL

-- shall be included if different from the number of meaningful digits given

-- in routingIndicator

}

SUPI ::= CHOICE

{

iMSI [1] IMSI,

nAI [2] NAI

}

SUPIUnauthenticatedIndication ::= BOOLEAN

SwitchOffIndicator ::= ENUMERATED

{

normalDetach(1),

switchOff(2)

}

TargetIdentifier ::= CHOICE

{

sUPI [1] SUPI,

iMSI [2] IMSI,

pEI [3] PEI,

iMEI [4] IMEI,

gPSI [5] GPSI,

mSISDN [6] MSISDN,

nAI [7] NAI,

iPv4Address [8] IPv4Address,

iPv6Address [9] IPv6Address,

ethernetAddress [10] MACAddress

}

TargetIdentifierProvenance ::= ENUMERATED

{

lEAProvided(1),

observed(2),

matchedOn(3),

other(4)

}

TELURI ::= UTF8String

Timestamp ::= GeneralizedTime

UEContextInfo ::= SEQUENCE

{

supportVoPS [1] BOOLEAN OPTIONAL,

supportVoPSNon3GPP [2] BOOLEAN OPTIONAL,

lastActiveTime [3] Timestamp OPTIONAL,

accessType [4] AccessType OPTIONAL,

rATType [5] RATType OPTIONAL

}

UEEndpointAddress ::= CHOICE

{

iPv4Address [1] IPv4Address,

iPv6Address [2] IPv6Address,

ethernetAddress [3] MACAddress

}

-- ===================

-- Location parameters

-- ===================

Location ::= SEQUENCE

{

locationInfo [1] LocationInfo OPTIONAL,

positioningInfo [2] PositioningInfo OPTIONAL,

locationPresenceReport [3] LocationPresenceReport OPTIONAL,

ePSLocationInfo [4] EPSLocationInfo OPTIONAL

}

CellSiteInformation ::= SEQUENCE

{

geographicalCoordinates [1] GeographicalCoordinates,

azimuth [2] INTEGER (0..359) OPTIONAL,

operatorSpecificInformation [3] UTF8String OPTIONAL

}

-- TS 29.518 [22], clause 6.4.6.2.6

LocationInfo ::= SEQUENCE

{

userLocation [1] UserLocation OPTIONAL,

currentLoc [2] BOOLEAN OPTIONAL,

geoInfo [3] GeographicArea OPTIONAL,

rATType [4] RATType OPTIONAL,

timeZone [5] TimeZone OPTIONAL,

additionalCellIDs [6] SEQUENCE OF CellInformation OPTIONAL

}

-- TS 29.571 [17], clause 5.4.4.7

UserLocation ::= SEQUENCE

{

eUTRALocation [1] EUTRALocation OPTIONAL,

nRLocation [2] NRLocation OPTIONAL,

n3GALocation [3] N3GALocation OPTIONAL

}

-- TS 29.571 [17], clause 5.4.4.8

EUTRALocation ::= SEQUENCE

{

tAI [1] TAI,

eCGI [2] ECGI,

ageOfLocationInfo [3] INTEGER OPTIONAL,

uELocationTimestamp [4] Timestamp OPTIONAL,

geographicalInformation [5] UTF8String OPTIONAL,

geodeticInformation [6] UTF8String OPTIONAL,

globalNGENbID [7] GlobalRANNodeID OPTIONAL,

cellSiteInformation [8] CellSiteInformation OPTIONAL,

globalENbID [9] GlobalRANNodeID OPTIONAL

}

-- TS 29.571 [17], clause 5.4.4.9

NRLocation ::= SEQUENCE

{

tAI [1] TAI,

nCGI [2] NCGI,

ageOfLocationInfo [3] INTEGER OPTIONAL,

uELocationTimestamp [4] Timestamp OPTIONAL,

geographicalInformation [5] UTF8String OPTIONAL,

geodeticInformation [6] UTF8String OPTIONAL,

globalGNbID [7] GlobalRANNodeID OPTIONAL,

cellSiteInformation [8] CellSiteInformation OPTIONAL

}

-- TS 29.571 [17], clause 5.4.4.10

N3GALocation ::= SEQUENCE

{

tAI [1] TAI OPTIONAL,

n3IWFID [2] N3IWFIDNGAP OPTIONAL,

uEIPAddr [3] IPAddr OPTIONAL,

portNumber [4] INTEGER OPTIONAL,

tNAPID [5] TNAPID OPTIONAL,

tWAPID [6] TWAPID OPTIONAL,

hFCNodeID [7] HFCNodeID OPTIONAL,

gLI [8] GLI OPTIONAL,

w5GBANLineType [9] W5GBANLineType OPTIONAL,

gCI [10] GCI OPTIONAL,

ageOfLocationInfo [11] INTEGER OPTIONAL,

uELocationTimestamp [12] Timestamp OPTIONAL,

protocol [13] TransportProtocol OPTIONAL

}

-- TS 38.413 [23], clause 9.3.2.4

IPAddr ::= SEQUENCE

{

iPv4Addr [1] IPv4Address OPTIONAL,

iPv6Addr [2] IPv6Address OPTIONAL

}

-- TS 29.571 [17], clause 5.4.4.28

GlobalRANNodeID ::= SEQUENCE

{

pLMNID [1] PLMNID,

aNNodeID [2] ANNodeID,

nID [3] NID OPTIONAL

}

ANNodeID ::= CHOICE

{

n3IWFID [1] N3IWFIDSBI,

gNbID [2] GNbID,

nGENbID [3] NGENbID,

eNbID [4] ENbID,

wAGFID [5] WAGFID,

tNGFID [6] TNGFID

}

-- TS 38.413 [23], clause 9.3.1.6

GNbID ::= BIT STRING(SIZE(22..32))

-- TS 29.571 [17], clause 5.4.4.4

TAI ::= SEQUENCE

{

pLMNID [1] PLMNID,

tAC [2] TAC,

nID [3] NID OPTIONAL

}

CGI ::= SEQUENCE

{

lAI [1] LAI,

cellID [2] CellID

}

LAI ::= SEQUENCE

{

pLMNID [1] PLMNID,

lAC [2] LAC

}

LAC ::= OCTET STRING (SIZE(2))

CellID ::= OCTET STRING (SIZE(2))

SAI ::= SEQUENCE

{

pLMNID [1] PLMNID,

lAC [2] LAC,

sAC [3] SAC

}

SAC ::= OCTET STRING (SIZE(2))

-- TS 29.571 [17], clause 5.4.4.5

ECGI ::= SEQUENCE

{

pLMNID [1] PLMNID,

eUTRACellID [2] EUTRACellID,

nID [3] NID OPTIONAL

}

TAIList ::= SEQUENCE OF TAI

-- TS 29.571 [17], clause 5.4.4.6

NCGI ::= SEQUENCE

{

pLMNID [1] PLMNID,

nRCellID [2] NRCellID,

nID [3] NID OPTIONAL

}

RANCGI ::= CHOICE

{

eCGI [1] ECGI,

nCGI [2] NCGI

}

CellInformation ::= SEQUENCE

{

rANCGI [1] RANCGI,

cellSiteinformation [2] CellSiteInformation OPTIONAL,

timeOfLocation [3] Timestamp OPTIONAL

}

-- TS 38.413 [23], clause 9.3.1.57

N3IWFIDNGAP ::= BIT STRING (SIZE(16))

-- TS 29.571 [17], clause 5.4.4.28

N3IWFIDSBI ::= UTF8String

-- TS 29.571 [17], clause 5.4.4.28 and table 5.4.2-1

TNGFID ::= UTF8String

-- TS 29.571 [17], clause 5.4.4.28 and table 5.4.2-1

WAGFID ::= UTF8String

-- TS 29.571 [17], clause 5.4.4.62

TNAPID ::= SEQUENCE

{

sSID [1] SSID OPTIONAL,

bSSID [2] BSSID OPTIONAL,

civicAddress [3] CivicAddressBytes OPTIONAL

}

-- TS 29.571 [17], clause 5.4.4.64

TWAPID ::= SEQUENCE

{

sSID [1] SSID OPTIONAL,

bSSID [2] BSSID OPTIONAL,

civicAddress [3] CivicAddressBytes OPTIONAL

}

-- TS 29.571 [17], clause 5.4.4.62 and clause 5.4.4.64

SSID ::= UTF8String

-- TS 29.571 [17], clause 5.4.4.62 and clause 5.4.4.64

BSSID ::= UTF8String

-- TS 29.571 [17], clause 5.4.4.36 and table 5.4.2-1

HFCNodeID ::= UTF8String

-- TS 29.571 [17], clause 5.4.4.10 and table 5.4.2-1

-- Contains the original binary data i.e. value of the YAML field after base64 encoding is removed

GLI ::= OCTET STRING (SIZE(0..150))

-- TS 29.571 [17], clause 5.4.4.10 and table 5.4.2-1

GCI ::= UTF8String

-- TS 29.571 [17], clause 5.4.4.10 and table 5.4.3.38

TransportProtocol ::= ENUMERATED

{

uDP(1),

tCP(2)

}

-- TS 29.571 [17], clause 5.4.4.10 and clause 5.4.3.33

W5GBANLineType ::= ENUMERATED

{

dSL(1),

pON(2)

}

-- TS 29.571 [17], table 5.4.2-1

TAC ::= OCTET STRING (SIZE(2..3))

-- TS 38.413 [23], clause 9.3.1.9

EUTRACellID ::= BIT STRING (SIZE(28))

-- TS 38.413 [23], clause 9.3.1.7

NRCellID ::= BIT STRING (SIZE(36))

-- TS 38.413 [23], clause 9.3.1.8

NGENbID ::= CHOICE

{

macroNGENbID [1] BIT STRING (SIZE(20)),

shortMacroNGENbID [2] BIT STRING (SIZE(18)),

longMacroNGENbID [3] BIT STRING (SIZE(21))

}

-- TS 23.003 [19], clause 12.7.1 encoded as per TS 29.571 [17], clause 5.4.2

NID ::= UTF8String (SIZE(11))

-- TS 36.413 [38], clause 9.2.1.37

ENbID ::= CHOICE

{

macroENbID [1] BIT STRING (SIZE(20)),

homeENbID [2] BIT STRING (SIZE(28)),

shortMacroENbID [3] BIT STRING (SIZE(18)),

longMacroENbID [4] BIT STRING (SIZE(21))

}

-- TS 29.518 [22], clause 6.4.6.2.3

PositioningInfo ::= SEQUENCE

{

positionInfo [1] LocationData OPTIONAL,

rawMLPResponse [2] RawMLPResponse OPTIONAL

}

RawMLPResponse ::= CHOICE

{

-- The following parameter contains a copy of unparsed XML code of the

-- MLP response message, i.e. the entire XML document containing

-- a <slia> (described in OMA-TS-MLP-V3\_5-20181211-C [20], clause 5.2.3.2.2) or

-- a <slirep> (described in OMA-TS-MLP-V3\_5-20181211-C [20], clause 5.2.3.2.3) MLP message.

mLPPositionData [1] UTF8String,

-- OMA MLP result id, defined in OMA-TS-MLP-V3\_5-20181211-C [20], Clause 5.4

mLPErrorCode [2] INTEGER (1..699)

}

-- TS 29.572 [24], clause 6.1.6.2.3

LocationData ::= SEQUENCE

{

locationEstimate [1] GeographicArea,

accuracyFulfilmentIndicator [2] AccuracyFulfilmentIndicator OPTIONAL,

ageOfLocationEstimate [3] AgeOfLocationEstimate OPTIONAL,

velocityEstimate [4] VelocityEstimate OPTIONAL,

civicAddress [5] CivicAddress OPTIONAL,

positioningDataList [6] SET OF PositioningMethodAndUsage OPTIONAL,

gNSSPositioningDataList [7] SET OF GNSSPositioningMethodAndUsage OPTIONAL,

eCGI [8] ECGI OPTIONAL,

nCGI [9] NCGI OPTIONAL,

altitude [10] Altitude OPTIONAL,

barometricPressure [11] BarometricPressure OPTIONAL

}

-- TS 29.172 [53], table 6.2.2-2

EPSLocationInfo ::= SEQUENCE

{

locationData [1] LocationData,

cGI [2] CGI OPTIONAL,

sAI [3] SAI OPTIONAL,

eSMLCCellInfo [4] ESMLCCellInfo OPTIONAL

}

-- TS 29.172 [53], clause 7.4.57

ESMLCCellInfo ::= SEQUENCE

{

eCGI [1] ECGI,

cellPortionID [2] CellPortionID

}

-- TS 29.171 [54], clause 7.4.31

CellPortionID ::= INTEGER (0..4095)

-- TS 29.518 [22], clause 6.2.6.2.5

LocationPresenceReport ::= SEQUENCE

{

type [1] AMFEventType,

timestamp [2] Timestamp,

areaList [3] SET OF AMFEventArea OPTIONAL,

timeZone [4] TimeZone OPTIONAL,

accessTypes [5] SET OF AccessType OPTIONAL,

rMInfoList [6] SET OF RMInfo OPTIONAL,

cMInfoList [7] SET OF CMInfo OPTIONAL,

reachability [8] UEReachability OPTIONAL,

location [9] UserLocation OPTIONAL,

additionalCellIDs [10] SEQUENCE OF CellInformation OPTIONAL

}

-- TS 29.518 [22], clause 6.2.6.3.3

AMFEventType ::= ENUMERATED

{

locationReport(1),

presenceInAOIReport(2)

}

-- TS 29.518 [22], clause 6.2.6.2.16

AMFEventArea ::= SEQUENCE

{

presenceInfo [1] PresenceInfo OPTIONAL,

lADNInfo [2] LADNInfo OPTIONAL

}

-- TS 29.571 [17], clause 5.4.4.27

PresenceInfo ::= SEQUENCE

{

presenceState [1] PresenceState OPTIONAL,

trackingAreaList [2] SET OF TAI OPTIONAL,

eCGIList [3] SET OF ECGI OPTIONAL,

nCGIList [4] SET OF NCGI OPTIONAL,

globalRANNodeIDList [5] SET OF GlobalRANNodeID OPTIONAL,

globalENbIDList [6] SET OF GlobalRANNodeID OPTIONAL

}

-- TS 29.518 [22], clause 6.2.6.2.17

LADNInfo ::= SEQUENCE

{

lADN [1] UTF8String,

presence [2] PresenceState OPTIONAL

}

-- TS 29.571 [17], clause 5.4.3.20

PresenceState ::= ENUMERATED

{

inArea(1),

outOfArea(2),

unknown(3),

inactive(4)

}

-- TS 29.518 [22], clause 6.2.6.2.8

RMInfo ::= SEQUENCE

{

rMState [1] RMState,

accessType [2] AccessType

}

-- TS 29.518 [22], clause 6.2.6.2.9

CMInfo ::= SEQUENCE

{

cMState [1] CMState,

accessType [2] AccessType

}

-- TS 29.518 [22], clause 6.2.6.3.7

UEReachability ::= ENUMERATED

{

unreachable(1),

reachable(2),

regulatoryOnly(3)

}

-- TS 29.518 [22], clause 6.2.6.3.9

RMState ::= ENUMERATED

{

registered(1),

deregistered(2)

}

-- TS 29.518 [22], clause 6.2.6.3.10

CMState ::= ENUMERATED

{

idle(1),

connected(2)

}

-- TS 29.572 [24], clause 6.1.6.2.5

GeographicArea ::= CHOICE

{

point [1] Point,

pointUncertaintyCircle [2] PointUncertaintyCircle,

pointUncertaintyEllipse [3] PointUncertaintyEllipse,

polygon [4] Polygon,

pointAltitude [5] PointAltitude,

pointAltitudeUncertainty [6] PointAltitudeUncertainty,

ellipsoidArc [7] EllipsoidArc

}

-- TS 29.572 [24], clause 6.1.6.3.12

AccuracyFulfilmentIndicator ::= ENUMERATED

{

requestedAccuracyFulfilled(1),

requestedAccuracyNotFulfilled(2)

}

-- TS 29.572 [24], clause 6.1.6.2.17

VelocityEstimate ::= CHOICE

{

horVelocity [1] HorizontalVelocity,

horWithVertVelocity [2] HorizontalWithVerticalVelocity,

horVelocityWithUncertainty [3] HorizontalVelocityWithUncertainty,

horWithVertVelocityAndUncertainty [4] HorizontalWithVerticalVelocityAndUncertainty

}

-- TS 29.572 [24], clause 6.1.6.2.14

CivicAddress ::= SEQUENCE

{

country [1] UTF8String,

a1 [2] UTF8String OPTIONAL,

a2 [3] UTF8String OPTIONAL,

a3 [4] UTF8String OPTIONAL,

a4 [5] UTF8String OPTIONAL,

a5 [6] UTF8String OPTIONAL,

a6 [7] UTF8String OPTIONAL,

prd [8] UTF8String OPTIONAL,

pod [9] UTF8String OPTIONAL,

sts [10] UTF8String OPTIONAL,

hno [11] UTF8String OPTIONAL,

hns [12] UTF8String OPTIONAL,

lmk [13] UTF8String OPTIONAL,

loc [14] UTF8String OPTIONAL,

nam [15] UTF8String OPTIONAL,

pc [16] UTF8String OPTIONAL,

bld [17] UTF8String OPTIONAL,

unit [18] UTF8String OPTIONAL,

flr [19] UTF8String OPTIONAL,

room [20] UTF8String OPTIONAL,

plc [21] UTF8String OPTIONAL,

pcn [22] UTF8String OPTIONAL,

pobox [23] UTF8String OPTIONAL,

addcode [24] UTF8String OPTIONAL,

seat [25] UTF8String OPTIONAL,

rd [26] UTF8String OPTIONAL,

rdsec [27] UTF8String OPTIONAL,

rdbr [28] UTF8String OPTIONAL,

rdsubbr [29] UTF8String OPTIONAL,

prm [30] UTF8String OPTIONAL,

pom [31] UTF8String OPTIONAL

}

-- TS 29.571 [17], clauses 5.4.4.62 and 5.4.4.64

-- Contains the original binary data i.e. value of the YAML field after base64 encoding is removed

CivicAddressBytes ::= OCTET STRING

-- TS 29.572 [24], clause 6.1.6.2.15

PositioningMethodAndUsage ::= SEQUENCE

{

method [1] PositioningMethod,

mode [2] PositioningMode,

usage [3] Usage,

methodCode [4] MethodCode OPTIONAL

}

-- TS 29.572 [24], clause 6.1.6.2.16

GNSSPositioningMethodAndUsage ::= SEQUENCE

{

mode [1] PositioningMode,

gNSS [2] GNSSID,

usage [3] Usage

}

-- TS 29.572 [24], clause 6.1.6.2.6

Point ::= SEQUENCE

{

geographicalCoordinates [1] GeographicalCoordinates

}

-- TS 29.572 [24], clause 6.1.6.2.7

PointUncertaintyCircle ::= SEQUENCE

{

geographicalCoordinates [1] GeographicalCoordinates,

uncertainty [2] Uncertainty

}

-- TS 29.572 [24], clause 6.1.6.2.8

PointUncertaintyEllipse ::= SEQUENCE

{

geographicalCoordinates [1] GeographicalCoordinates,

uncertainty [2] UncertaintyEllipse,

confidence [3] Confidence

}

-- TS 29.572 [24], clause 6.1.6.2.9

Polygon ::= SEQUENCE

{

pointList [1] SET SIZE (3..15) OF GeographicalCoordinates

}

-- TS 29.572 [24], clause 6.1.6.2.10

PointAltitude ::= SEQUENCE

{

point [1] GeographicalCoordinates,

altitude [2] Altitude

}

-- TS 29.572 [24], clause 6.1.6.2.11

PointAltitudeUncertainty ::= SEQUENCE

{

point [1] GeographicalCoordinates,

altitude [2] Altitude,

uncertaintyEllipse [3] UncertaintyEllipse,

uncertaintyAltitude [4] Uncertainty,

confidence [5] Confidence

}

-- TS 29.572 [24], clause 6.1.6.2.12

EllipsoidArc ::= SEQUENCE

{

point [1] GeographicalCoordinates,

innerRadius [2] InnerRadius,

uncertaintyRadius [3] Uncertainty,

offsetAngle [4] Angle,

includedAngle [5] Angle,

confidence [6] Confidence

}

-- TS 29.572 [24], clause 6.1.6.2.4

GeographicalCoordinates ::= SEQUENCE

{

latitude [1] UTF8String,

longitude [2] UTF8String,

mapDatumInformation [3] OGCURN OPTIONAL

}

-- TS 29.572 [24], clause 6.1.6.2.22

UncertaintyEllipse ::= SEQUENCE

{

semiMajor [1] Uncertainty,

semiMinor [2] Uncertainty,

orientationMajor [3] Orientation

}

-- TS 29.572 [24], clause 6.1.6.2.18

HorizontalVelocity ::= SEQUENCE

{

hSpeed [1] HorizontalSpeed,

bearing [2] Angle

}

-- TS 29.572 [24], clause 6.1.6.2.19

HorizontalWithVerticalVelocity ::= SEQUENCE

{

hSpeed [1] HorizontalSpeed,

bearing [2] Angle,

vSpeed [3] VerticalSpeed,

vDirection [4] VerticalDirection

}

-- TS 29.572 [24], clause 6.1.6.2.20

HorizontalVelocityWithUncertainty ::= SEQUENCE

{

hSpeed [1] HorizontalSpeed,

bearing [2] Angle,

uncertainty [3] SpeedUncertainty

}

-- TS 29.572 [24], clause 6.1.6.2.21

HorizontalWithVerticalVelocityAndUncertainty ::= SEQUENCE

{

hSpeed [1] HorizontalSpeed,

bearing [2] Angle,

vSpeed [3] VerticalSpeed,

vDirection [4] VerticalDirection,

hUncertainty [5] SpeedUncertainty,

vUncertainty [6] SpeedUncertainty

}

-- The following types are described in TS 29.572 [24], table 6.1.6.3.2-1

Altitude ::= UTF8String

Angle ::= INTEGER (0..360)

Uncertainty ::= INTEGER (0..127)

Orientation ::= INTEGER (0..180)

Confidence ::= INTEGER (0..100)

InnerRadius ::= INTEGER (0..65535)

AgeOfLocationEstimate ::= INTEGER (0..32767)

HorizontalSpeed ::= UTF8String

VerticalSpeed ::= UTF8String

SpeedUncertainty ::= UTF8String

BarometricPressure ::= INTEGER (30000..155000)

-- TS 29.572 [24], clause 6.1.6.3.13

VerticalDirection ::= ENUMERATED

{

upward(1),

downward(2)

}

-- TS 29.572 [24], clause 6.1.6.3.6

PositioningMethod ::= ENUMERATED

{

cellID(1),

eCID(2),

oTDOA(3),

barometricPressure(4),

wLAN(5),

bluetooth(6),

mBS(7),

motionSensor(8),

dLTDOA(9),

dLAOD(10),

multiRTT(11),

nRECID(12),

uLTDOA(13),

uLAOA(14),

networkSpecific(15)

}

-- TS 29.572 [24], clause 6.1.6.3.7

PositioningMode ::= ENUMERATED

{

uEBased(1),

uEAssisted(2),

conventional(3)

}

-- TS 29.572 [24], clause 6.1.6.3.8

GNSSID ::= ENUMERATED

{

gPS(1),

galileo(2),

sBAS(3),

modernizedGPS(4),

qZSS(5),

gLONASS(6),

bDS(7),

nAVIC(8)

}

-- TS 29.572 [24], clause 6.1.6.3.9

Usage ::= ENUMERATED

{

unsuccess(1),

successResultsNotUsed(2),

successResultsUsedToVerifyLocation(3),

successResultsUsedToGenerateLocation(4),

successMethodNotDetermined(5)

}

-- TS 29.571 [17], table 5.2.2-1

TimeZone ::= UTF8String

-- Open Geospatial Consortium URN [35]

OGCURN ::= UTF8String

-- TS 29.572 [24], clause 6.1.6.2.15

MethodCode ::= INTEGER (16..31)

END

#### \*\*\* End of Third Change \*\*\*

#### \*\*\* Last Change \*\*\*