**3GPP TSG-SA3 Meeting #88-LI-e-b *s3i230143***

**Online, , 21st Feb 2023 - 23rd Feb 2023**

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| --- |
| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **33.128** | **CR** | **0497** | **rev** | **1** | **Current version:** | **18.2.0** |  |
|  |
| *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:***  | Addition of Access Network Information to IMS Records |
|  |  |
| ***Source to WG:*** | SA3-LI (OTD\_US) |
| ***Source to TSG:*** | SA3 |
|  |  |
| ***Work item code:*** | LI18 |  | ***Date:*** | 2/21/2023 |
|  |  |  |  |  |
| ***Category:*** | **C** |  | ***Release:*** | Rel-18 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
|  |  |
| ***Reason for change:*** | Currently, when location is not authorized, there is no way to report any Access Network Information.  |
|  |  |
| ***Summary of change:*** | This CR extends the existing IMS message structure to include access network information that is not related to location.Additionally, the tables for the IMS messages are updated to include types and cardinality information. Tables for currently undescribed parameters  |
|  |  |
| ***Consequences if not approved:*** | Some authorized information would not be sent to LEAs. |
|  |  |
| ***Clauses affected:*** | 7.12.4.2.1, 7.12.4.2.2, 7.12.4.2.3, New 7.12.4.X, Annex A |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS 33.128 CR 0496  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** | CR 0496 (S3i230144) also defines the ASN.1 for the new parameters SIPAccessNetworkInformation and SIPCellularNetworkInformation.This CR is associated with the following changes in the Forge:Merge request: [!152](https://forge.3gpp.org/rep/sa3/li/-/merge_requests/152) Commit hash: [b9008a01feda54f8bfef44750ab4936191a6cebf](https://forge.3gpp.org/rep/sa3/li/-/merge_requests/152/diffs?commit_id=b9008a01feda54f8bfef44750ab4936191a6cebf)  |
|  |  |
| ***This CR's revision history:*** | S3i230138 |

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

##### 7.12.4.2.1 IMS Message

For an intercepted IMS based communication (see clause 7.12.2.8), the IRI-POI present in the IMS Signaling Function shall generate the xIRI IMSMessage from the SIP message used to handle that IMS based communication. All SIP messages use the same xIRI record as shown in table 7.12.4.2-1.

Table 7.12.4.2-1: Payload for IMSMessage record

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| --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Cardinality** | **Description** | **M/C/O** |
| payload | IMSPayload | 1 | One of the following payload types (other payload types may be added in future versions of the specification):- encapsulatedSIPMessage: See table 7.12.4.X.1-1 | M |
| sessionDirection | SessionDirection | 1 | Indicates the direction of the SIP session: fromTarget, toTarget, combined (if target calls him/herself) or indeterminate if the direction cannot be determined reliable (see NOTE). | M |
| voIPRoamingIndication | VoIPRoamingIndication | 0..1 | Indicates whether the roaming mode is inbound LBO, S8HR or N9HR when the target is in roaming situation. | C |
| location | Location | 0..1 | Location with timestamp, if available.Shall include all location information for the target UE available at the NF where the POI is located encoded as *location>IMSLocation.* | C |
| accessNetworkInformation | SEQUENCE OF SIPAccessNetworkInformation | 0..MAX | Provides non-location related access network information. Shall be present if available at the NF where the POI is located. One instance of SIPAccessNetworkInformation shall be used for each P-Access-Network-Information header. | C |
| cellularNetworkInformation | SEQUENCE OF SIPCellularNetworkInformation | 0..MAX | Provides non-location related cellular network information. Shall be present if available at the NF where the POI is located. One instance of SIPCellularNetworkInformation shall be used for each Cellular-Network-Info header. | C |
| NOTE: When an incoming call to a target is redirected to another user, the sessionDirection field shall be set to toTarget. When an incoming call from a target non-local ID to an IMS user is redirected to, the sessionDirection field shall be set to fromTarget. |

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Table 7.12.4.2-2: VOID

The IRI-POI present in the IMS signaling function generating an xIRI containing an IMSMessage record shall set:

- The Payload Direction field in the PDU header to the direction of the signaling message carried in the IRI payload (see ETSI TS 103 221-2 [8] clause 5.2.6). If the signalling message was sent from the target, the Direction Value "3" (sent from the target) shall be used, if the signalling message was sent to the target, the Direction Value "2" (sent to the target) shall be used; if the direction could not be determined reliably, the Direction Value "1" (not known to the POI) shall be used. If the SIP message is sent from and to the target, the Direction Value "4" (more than one direction) shall be used. For the SIP messages generated by the network, the Direction Value "5" (not applicable) shall be used.

- The conditional source IPv4 address or source IPv6 address field in the PDU header to the source IP address of the intercepted SIP message (see ETSI TS 103 221-2 [8] clause 5.3). It shall contain the source address of the packet from the 32-bit "Source Address" field in IPv4, as defined in IETF RFC 791 [34], or from the 128-bit "Source Address" field in IPv6, as defined in IETF RFC 2460 [27].

- The conditional destination IPv4 address or destination IPv6 address field in the PDU header to the destination IP address of the intercepted SIP message (see ETSI TS 103 221-2 [8] clause 5.3). It shall contain the destination address of the packet from the 32-bit "Source Address" field in IPv4, as defined in IETF RFC 791 [34], or from the 128-bit "Source Address" field in IPv6, as defined in IETF RFC 2460 [27].

##### 7.12.4.2.2 Start of interception with Active IMS session

The IRI-POI present in the IMS signaling function shall generate the xIRI StartOfInterceptionForActiveIMSSession when all of the following conditions are met:

- The IRI-POI receives an LI\_X1: ActivateTask from the LIPF.

- The IRI-POI detects the IMS user identified by one or more of the target identifier (s) included in the ActivateTask is on an active IMS session.

 - The-IRI-POI in the IMS signaling functions meets the criteria mentioned in TS 33.127 [5] for providing the IRI-POI functions.

The generation of the xIRI shall be independent of the IMS media associated with the session. If multiple IMS sessions are active at the start of interception, a StartOfInterceptionForActiveIMSSession record shall be generated for each active session.

The following table contains parameters, with IRITargetIdentifier, generated by the IRI-POI.

Table 7.12.4.2.-3: Payload for StartOfInterceptionForActiveIMSSession record

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| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| originatingId | SEQUENCE OF IMPU | 1..MAX | Identities of the originator of the session. | M |
| terminatingId | IMPU | 1 | Identities of the termination of the service. | M |
| sDPState | SEQUENCE OF OCTET STRING | 0..MAX | Latest state of session from IMS signaling function (including LMISF) will provide the agreed SDP answer and related modification (encoded in SDP format as per RFC 4566 [43] clause 5 when known.) for each media stream of the target. | C |
| diversionIdentity | IMPU | 0..1 | Provided if available and applicable. | C |
| voIPRoamingIndication | VoIPRoamingIndication | 0..1 | Indicates whether the roaming mode is LBO, S8HR or N9HR.when the target is in roaming situation. | C |
| location | Location | 0..1 | Location with timestamp, if available.Shall include all location information for the target UE available at the NF where the POI is located encoded as *location>IMSLocation.* | C |
| accessNetworkInformation | SEQUENCE OF SIPAccessNetworkInformation | 0..MAX | Provides non-location related access network information. Shall be present if available at the NF where the POI is located. One instance of SIPAccessNetworkInformation shall be used for each P-Access-Network-Information header. | C |
| cellularNetworkInformation | SEQUENCE OF SIPCellularNetworkInformation | 0..MAX | Provides non-location related cellular network information. Shall be present if available at the NF where the POI is located. One instance of SIPCellularNetworkInformation shall be used for each Cellular-Network-Info header. | C |

##### 7.12.4.2.3 IMS CC Unavailable

The IRI-POI present in the IMS signaling function that also has the CC-TF (which would have triggered the media interception at the CC-POI) shall generate the xIRI IMSCCUnavailable when the media is not available for interception in the CSP's network.

Accordingly, the IRI-POI present in the IMS signaling function that has the CC-TF shall generate the xIRI IMSCCUnavailable when the following conditions are met:

- The target of interception is on an IMS session with established SDP offer and answer.

- The media does not enter the IMS network of the CSP that has received the warrant. In other words, the CC-TF does not send the LI\_T3 ActivateTask to the CC-POI.

- The CSP is required to send a notification to the LEMF when the media interception is required but not available for the interception.

NOTE: The details of any interactions required between the IRI-POI and CC-TF present in the same IMS Signaling Function (e.g. IBCF) is outside the scope of the present document.

The payload of the IMSCCUnavailable xIRI is as shown in table 7.12.4.2-4.

Table 7.12.4.2.-4: Payload for IMSCCUnavailable record

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|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| cCUnavailableReason | UTF8String | 1 | Provides the reason for the unavailability of CC. | M |
| sDPState | OCTET STRING | 0..1 | The latest SDP information, if known. | C |

#### 7.12.4.X IMS record parameters

##### 7.12.4.X.1 Type: IMSPayload

Table 7.12.4.X.1-1 contains the details for the IMSPayload type.

Table 7.12.4.X.1-1: Definition of Choices for IMSPayload

|  |  |  |
| --- | --- | --- |
| CHOICE | Type | Description |
| encapsulatedSIPMessage | SIPMessage | Shall be used to report entire SIPMessage when the SIP message does not contain any unauthorized information. |

##### 7.12.4.X.2 Enumeration: SessionDirection

The SessionDirection indicates the direction of the SIP session with regards to the target.

Table 7.12.4.X.2-1 contains the details for the SessionDirection type.

Table 7.12.4.X.2-1: Enumeration SessionDirection

|  |  |
| --- | --- |
| Enumeration value | Description |
| fromTarget(1) | The session was initiated by the target. |
| toTarget(2) | The session was initiated by a party that is not the target. |
| combined(3) | The target initiates a session toward itself. |
| indeterminate(4) | The direction of the session cannot be determined. |

##### 7.12.4.X.3 Enumeration: VoIPRoamingIndication

The VoIPRoamingIndication indicates the type of roaming in use when the target is in a roaming state.

Table 7.12.4.X.3-1 contains the details for the VoIPRoaminIndication type.

Table 7.12.4.X.3-1: Enumeration VoIPRoamingIndication

|  |  |
| --- | --- |
| Enumeration value | Description |
| roamingLBO(1) | The target is roaming and using Local Breakout. |
| roamingS8HR(2) | The target is using S8 Home Routed Roaming. |
| roamingN9HR(3) | The target is using N9 Home Routed Roaming. |

##### 7.12.4.X.4 Type: SIPMessage

Table 7.12.4.X.4-1: Structure of the SIPMessage type

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| iPSourceAddress | IPAddress | 1 | Indicates the conditional source IPv4 address or source IPv6 address field in the PDU header to the source IP address of the intercepted SIP message (see ETSI TS 103 221-2 [8] clause 5.3). | M |
| iPDestinationAddress | IPAddress | 1 | Indicates the conditional destination IPv4 address or destination IPv6 address field in the PDU header to the destination IP address of the intercepted SIP message (see ETSI TS 103 221-2 [8] clause 5.3). | M |
| sIPContent | OCTET STRING | 1 | The relevant SIP message, or SIP message header if the warrant requires IRI-only. In addition, for IRI-only intercepts, specific content (e.g. SIP MESSAGE method) may have to be deleted. | M |

##### 7.12.4.X.5 Type: SIPAccessNetworkInformation

Table 7.12.4.X.5-1: Structure of the SIPAccessNetworkInformation type

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| accessNetworkInfo | UTF8String | 1 | Contains the contents of the P-Access-Network-Info Header not including the text from any access-info parameter fields. This field shall include any extension-access-info parameter fields (see TS 24.229 [74] clause 7.2A.4). | M |
| servingPLMN | PLMNID | 0..1 | Indicates the PLMN of the serving network. Shall be included if this information is present in the access-info field of the PANI header. | C |

##### 7.12.4.X.6 Type: SIPCellularNetworkInformation

Table 7.12.4.X.5-1: Structure of the SIPCellularNetworkInformation type

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| cellularNetworkInfo | UTF8String | 1 | Contains the contents of the Cellular-Network-Info Header not including the text from any cellular-access-info field parameters. This field shall include any extension-access-info parameter fields (see TS 24.229 [74] clause 7.2.15). | M |
| servingPLMN | PLMNID | 0..1 | Indicates the PLMN of the serving network. Shall be included if this information is present in the access-info field of the CNI header. | C |

## \*\*\*\* END OF MAIN DOCUMENTS CHANGES \*\*\*

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

Annex A (normative):
ASN.1 Schema for the Internal and External Interfaces

TS33128Payloads

{itu-t(0) identified-organization(4) etsi(0) securityDomain(2) lawfulIntercept(2) threeGPP(4) ts33128(19) r18(18) version2(2)}

DEFINITIONS IMPLICIT TAGS EXTENSIBILITY IMPLIED ::=

BEGIN

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

-- Relative OIDs

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

tS33128PayloadsOID RELATIVE-OID ::= {threeGPP(4) ts33128(19) r18(18) version2(2)}

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

{

 -- AMF events, see clause 6.2.2.2

 registration [1] AMFRegistration,

 deregistration [2] AMFDeregistration,

 locationUpdate [3] AMFLocationUpdate,

 startOfInterceptionWithRegisteredUE [4] AMFStartOfInterceptionWithRegisteredUE,

 unsuccessfulAMProcedure [5] AMFUnsuccessfulProcedure,

 -- SMF events, see clause 6.2.3.2

 pDUSessionEstablishment [6] SMFPDUSessionEstablishment,

 pDUSessionModification [7] SMFPDUSessionModification,

 pDUSessionRelease [8] SMFPDUSessionRelease,

 startOfInterceptionWithEstablishedPDUSession [9] SMFStartOfInterceptionWithEstablishedPDUSession,

 unsuccessfulSMProcedure [10] SMFUnsuccessfulProcedure,

 -- UDM events, see clause 7.2.2.3

 servingSystemMessage [11] UDMServingSystemMessage,

 -- SMS events, see clause 6.2.5.2

 sMSMessage [12] SMSMessage,

 -- LALS events, see clause 7.3.1.4

 lALSReport [13] LALSReport,

 -- PDHR/PDSR events, see clauses 6.2.3.5 and 6.2.3.9

 pDHeaderReport [14] PDHeaderReport,

 pDSummaryReport [15] PDSummaryReport,

 -- Tag 16 is reserved because there is no equivalent mDFCellSiteReport in XIRIEvent.

 -- MMS events, see clause 7.4.3

 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 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,

 -- UDM events, see clause 7.2.2.3, continued from tag 11

 subscriberRecordChangeMessage [54] UDMSubscriberRecordChangeMessage,

 cancelLocationMessage [55] UDMCancelLocationMessage,

 -- SMS events, see clause 6.2.5.2, continued from tag 12

 sMSReport [56] SMSReport,

 -- SMF MA PDU session 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,

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

 sMFPDUtoMAPDUSessionModification [64] SMFPDUtoMAPDUSessionModification,

 -- NEF events, see clause 7.7.2.1

 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 events, see clause 7.8.2.1

 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,

 -- 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 clauses 7.9.1.3 and 7.9.1.4

 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 7.3.4.1

 separatedLocationReporting [102] SeparatedLocationReporting,

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

 sTIRSHAKENSignatureGeneration [103] STIRSHAKENSignatureGeneration,

 sTIRSHAKENSignatureValidation [104] STIRSHAKENSignatureValidation,

 -- IMS events, see clause 7.12.4.2

 iMSMessage [105] IMSMessage,

 startOfInterceptionForActiveIMSSession [106] StartOfInterceptionForActiveIMSSession,

 iMSCCUnavailable [107] IMSCCUnavailable,

 -- UDM events, see clause 7.2.2.3, continued from tag 55

 uDMLocationInformationResult [108] UDMLocationInformationResult,

 uDMUEInformationResponse [109] UDMUEInformationResponse,

 uDMUEAuthenticationResponse [110] UDMUEAuthenticationResponse,

 -- AMF events, see 6.2.2.2.8, continued from tag 5

 positioningInfoTransfer [111] AMFPositioningInfoTransfer,

 -- MME events, see clause 6.3.2.2.8, continued from tag 91

 mMEPositioningInfoTransfer [112] MMEPositioningInfoTransfer,

 -- AMF events, see 6.2.2.2.9, continued from tag 111

 aMFRANHandoverCommand [113] AMFRANHandoverCommand,

 aMFRANHandoverRequest [114] AMFRANHandoverRequest,

 -- EES events, see clause 7.14.2

 eESEECRegistration [115] EESEECRegistration,

 eESEASDiscovery [116] EESEASDiscovery,

 eESEASDiscoverySubscription [117] EESEASDiscoverySubscription,

 eESEASDiscoveryNotification [118] EESEASDiscoveryNotification,

 eESAppContextRelocation [119] EESAppContextRelocation,

 eESACRSubscription [120] EESACRSubscription,

 eESACRNotification [121] EESACRNotification,

 eESEECContextRelocation [122] EESEECContextRelocation,

 eESStartOfInterceptionWithRegisteredEEC [123] EESStartOfInterceptionWithRegisteredEEC,

 -- UDM events, see clause 7.2.2.3, continued from tag 110

 uDMStartOfInterceptionWithRegisteredTarget [124] UDMStartOfInterceptionWithRegisteredTarget,

 -- 5GMS AF events, see clause 7.15.2

 fiveGMSAFServiceAccessInformation [125] FiveGMSAFServiceAccessInformation,

 fiveGMSAFConsumptionReporting [126] FiveGMSAFConsumptionReporting,

 fiveGMSAFDynamicPolicyInvocation [127] FiveGMSAFDynamicPolicyInvocation,

 fiveGMSAFMetricsReporting [128] FiveGMSAFMetricsReporting,

 fiveGMSAFNetworkAssistance [129] FiveGMSAFNetworkAssistance,

 fiveGMSAFUnsuccessfulProcedure [130] FiveGMSAFUnsuccessfulProcedure,

 fiveGMSAFStartOfInterceptionWithAlreadyConfiguredUE [131] FiveGMSAFStartOfInterceptionWithAlreadyConfiguredUE,

 --AMF events, see 6.2.2.2.10, continued from tag 114

 aMFUEConfigurationUpdate [132] AMFUEConfigurationUpdate,

 -- HSS events, see clause 7.2.3.3

 hSSServingSystemMessage [133] HSSServingSystemMessage,

 hSSStartOfInterceptionWithRegisteredTarget [134] HSSStartOfInterceptionWithRegisteredTarget

}

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

-- 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

{

 -- AMF events, see clause 6.2.2.3

 registration [1] AMFRegistration,

 deregistration [2] AMFDeregistration,

 locationUpdate [3] AMFLocationUpdate,

 startOfInterceptionWithRegisteredUE [4] AMFStartOfInterceptionWithRegisteredUE,

 unsuccessfulAMProcedure [5] AMFUnsuccessfulProcedure,

 -- SMF events, see clause 6.2.3.7

 pDUSessionEstablishment [6] SMFPDUSessionEstablishment,

 pDUSessionModification [7] SMFPDUSessionModification,

 pDUSessionRelease [8] SMFPDUSessionRelease,

 startOfInterceptionWithEstablishedPDUSession [9] SMFStartOfInterceptionWithEstablishedPDUSession,

 unsuccessfulSMProcedure [10] SMFUnsuccessfulProcedure,

 -- UDM events, see clause 7.2.2.4

 servingSystemMessage [11] UDMServingSystemMessage,

 -- SMS events, see clause 6.2.5.4

 sMSMessage [12] SMSMessage,

 -- LALS events, see clause 7.3.1.5

 lALSReport [13] LALSReport,

 -- PDHR/PDSR events, see clause 6.2.3.9

 pDHeaderReport [14] PDHeaderReport,

 pDSummaryReport [15] PDSummaryReport,

 -- MDF events, see clause 7.3.2.2

 mDFCellSiteReport [16] MDFCellSiteReport,

 -- MMS events, see clause 7.4.4.1

 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 events, see clauses 7.5.2 and 7.5.3.1

 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,

 -- UDM events, see clause 7.2.2.4, continued from tag 11

 subscriberRecordChangeMessage [54] UDMSubscriberRecordChangeMessage,

 cancelLocationMessage [55] UDMCancelLocationMessage,

 -- SMS events, see clause 6.2.5.4, continued from tag 12

 sMSReport [56] SMSReport,

 -- SMF MA PDU session events, see clause 6.2.3.7

 sMFMAPDUSessionEstablishment [57] SMFMAPDUSessionEstablishment,

 sMFMAPDUSessionModification [58] SMFMAPDUSessionModification,

 sMFMAPDUSessionRelease [59] SMFMAPDUSessionRelease,

 startOfInterceptionWithEstablishedMAPDUSession [60] SMFStartOfInterceptionWithEstablishedMAPDUSession,

 unsuccessfulMASMProcedure [61] SMFMAUnsuccessfulProcedure,

 -- Identifier Association events, see clauses 6.2.2.3 and 6.3.2.3

 aMFIdentifierAssociation [62] AMFIdentifierAssociation,

 mMEIdentifierAssociation [63] MMEIdentifierAssociation,

 -- SMF PDU to MA PDU session events, see clause 6.2.3.7

 sMFPDUtoMAPDUSessionModification [64] SMFPDUtoMAPDUSessionModification,

 -- NEF events, see clause 7.7.2.3

 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 events, see clause 7.8.2.3

 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,

 -- MME events, see clause 6.3.2.3

 mMEAttach [87] MMEAttach,

 mMEDetach [88] MMEDetach,

 mMELocationUpdate [89] MMELocationUpdate,

 mMEStartOfInterceptionWithEPSAttachedUE [90] MMEStartOfInterceptionWithEPSAttachedUE,

 mMEUnsuccessfulProcedure [91] MMEUnsuccessfulProcedure,

 -- AKMA key management events, see clause 7.9.1.5

 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 7.3.4.1

 separatedLocationReporting [102] SeparatedLocationReporting,

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

 sTIRSHAKENSignatureGeneration [103] STIRSHAKENSignatureGeneration,

 sTIRSHAKENSignatureValidation [104] STIRSHAKENSignatureValidation,

 -- IMS events, see clause 7.12.7

 iMSMessage [105] IMSMessage,

 startOfInterceptionForActiveIMSSession [106] StartOfInterceptionForActiveIMSSession,

 iMSCCUnavailable [107] IMSCCUnavailable,

 -- UDM events, see clause 7.2.2.4, continued from tag 55

 uDMLocationInformationResult [108] UDMLocationInformationResult,

 uDMUEInformationResponse [109] UDMUEInformationResponse,

 uDMUEAuthenticationResponse [110] UDMUEAuthenticationResponse,

 -- AMF events, see 6.2.2.3, continued from tag 5

 positioningInfoTransfer [111] AMFPositioningInfoTransfer,

 -- MME events, see clause 6.3.2.3, continued from tag 91

 mMEPositioningInfoTransfer [112] MMEPositioningInfoTransfer,

 -- AMF events, see 6.2.2.3, continued from tag 111

 aMFRANHandoverCommand [113] AMFRANHandoverCommand,

 aMFRANHandoverRequest [114] AMFRANHandoverRequest,

 -- EES events, see clause 7.14.2.11

 eESEECRegistration [115] EESEECRegistration,

 eESEASDiscovery [116] EESEASDiscovery,

 eESEASDiscoverySubscription [117] EESEASDiscoverySubscription,

 eESEASDiscoveryNotification [118] EESEASDiscoveryNotification,

 eESAppContextRelocation [119] EESAppContextRelocation,

 eESACRSubscription [120] EESACRSubscription,

 eESACRNotification [121] EESACRNotification,

 eESEECContextRelocation [122] EESEECContextRelocation,

 eESStartOfInterceptionWithRegisteredEEC [123] EESStartOfInterceptionWithRegisteredEEC,

 -- UDM events, see clause 7.2.2.4, continued from tag 110

 uDMStartOfInterceptionWithRegisteredTarget [124] UDMStartOfInterceptionWithRegisteredTarget,

 -- 5GMS AF events, see clause 7.15.3

 fiveGMSAFServiceAccessInformation [125] FiveGMSAFServiceAccessInformation,

 fiveGMSAFConsumptionReporting [126] FiveGMSAFConsumptionReporting,

 fiveGMSAFDynamicPolicyInvocation [127] FiveGMSAFDynamicPolicyInvocation,

 fiveGMSAFMetricsReporting [128] FiveGMSAFMetricsReporting,

 fiveGMSAFNetworkAssistance [129] FiveGMSAFNetworkAssistance,

 fiveGMSAFUnsuccessfulProcedure [130] FiveGMSAFUnsuccessfulProcedure,

 fiveGMSAFStartOfInterceptionWithAlreadyConfiguredUE [131] FiveGMSAFStartOfInterceptionWithAlreadyConfiguredUE,

 --AMF events, see 6.2.2.3, continued from tag 114

 aMFUEConfigurationUpdate [132] AMFUEConfigurationUpdate,

 -- HSS events, see clause 7.2.3.4

 hSSServingSystemMessage [133] HSSServingSystemMessage,

 hSSStartOfInterceptionWithRegisteredTarget [134] HSSStartOfInterceptionWithRegisteredTarget

}

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,

 -- In Rel-16 (threeGPP(4) ts33128(19) r16(16) version9(9)),

 -- tag 4 is pTCCCPDU and tag 5 is not used.

 -- Rel-17 or newer decoders should decode tag 4 contents as PTCCCPDU if

 -- r16 is used in cCPayloadOID.

 nIDDCCPDU [4] NIDDCCPDU,

 pTCCCPDU [5] PTCCCPDU,

 iMSCCPDU [6] IMSCCPDU

}

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

-- 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,

 pagingRestrictionIndicator [17] PagingRestrictionIndicator 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))

}

-- See clause 6.2.2.2.9.2 for details of this structure

AMFRANHandoverCommand ::= SEQUENCE

{

 userIdentifiers [1] UserIdentifiers,

 aMFUENGAPID [2] AMFUENGAPID,

 rANUENGAPID [3] RANUENGAPID,

 handoverType [4] HandoverType,

 targetToSourceContainer [5] RANTargetToSourceContainer

}

-- See clause 6.2.2.2.9.3 for details of this structure

AMFRANHandoverRequest ::= SEQUENCE

{

 userIdentifiers [1] UserIdentifiers,

 aMFUENGAPID [2] AMFUENGAPID,

 rANUENGAPID [3] RANUENGAPID,

 handoverType [4] HandoverType,

 handoverCause [5] HandoverCause,

 pDUSessionResourceInformation [6] PDUSessionResourceInformation,

 mobilityRestrictionList [7] MobilityRestrictionList OPTIONAL,

 locationReportingRequestType [8] LocationReportingRequestType OPTIONAL,

 targetToSourceContainer [9] RANTargetToSourceContainer,

 nPNAccessInformation [10] NPNAccessInformation OPTIONAL,

 sourceToTargetContainer [11] RANSourceToTargetContainer

}

--See clause 6.2.2.2.10 on for details of this structure

AMFUEConfigurationUpdate ::= SEQUENCE

{

 userIdentifiers [1] UserIdentifiers,

 gUTI [2] GUTI,

 oldGUTI [3] EPS5GGUTI OPTIONAL,

 fiveGSTAIList [4] TAIList OPTIONAL,

 slice [5] Slice OPTIONAL,

 serviceAreaList [6] ServiceAreaList OPTIONAL,

 registrationResult [7] AMFRegistrationResult OPTIONAL,

 sMSOverNASIndicator [8] SMSOverNASIndicator OPTIONAL

}

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

-- 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),

 sNPNOnboarding(5),

 disasterMobility(6),

 disasterInitial(7)

}

AMFSetID ::= INTEGER (0..1023)

AMFUENGAPID ::= INTEGER (0..1099511627775)

-- TS 24.501 [13], clause 9.11.3.49

ServiceAreaList ::= OCTET STRING (SIZE(4..112))

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

-- 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,

 selectedDNN [21] DNN OPTIONAL,

 servingNetwork [22] SMFServingNetwork OPTIONAL,

 oldPDUSessionID [23] PDUSessionID OPTIONAL,

 handoverState [24] HandoverState OPTIONAL,

 gTPTunnelInfo [25] GTPTunnelInfo OPTIONAL,

 pCCRules [26] PCCRuleSet OPTIONAL,

 ePSPDNConnectionEstablishment [27] EPSPDNConnectionEstablishment 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,

 uEEndpoint [13] UEEndpointAddress OPTIONAL,

 servingNetwork [14] SMFServingNetwork OPTIONAL,

 handoverState [15] HandoverState OPTIONAL,

 gTPTunnelInfo [16] GTPTunnelInfo OPTIONAL,

 pCCRules [17] PCCRuleSet OPTIONAL,

 ePSPDNConnectionModification[18] EPSPDNConnectionModification OPTIONAL,

 uPPathChange [19] UPPathChange OPTIONAL,

 pFDDataForApp [20] PFDDataForApp 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,

 nGAPCause [12] NGAPCauseInt OPTIONAL,

 fiveGMMCause [13] FiveGMMCause OPTIONAL,

 pCCRuleIDs [14] PCCRuleIDSet OPTIONAL,

 ePSPDNConnectionRelease [15] EPSPDNConnectionRelease 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,

 uEEPSPDNConnection [21] UEEPSPDNConnection OPTIONAL,

 servingNetwork [22] SMFServingNetwork OPTIONAL,

 gTPTunnelInfo [23] GTPTunnelInfo OPTIONAL,

 pCCRules [24] PCCRuleSet OPTIONAL,

 ePSStartOfInterceptionWithEstablishedPDNConnection [25] EPSStartOfInterceptionWithEstablishedPDNConnection OPTIONAL,

 pFDDataForApps [26] PFDDataForApps 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,

 uEEndpoint [14] UEEndpointAddress OPTIONAL,

 servingNetwork [15] SMFServingNetwork OPTIONAL,

 handoverState [16] HandoverState OPTIONAL,

 gTPTunnelInfo [17] GTPTunnelInfo OPTIONAL,

 ePSPDNConnectionModification [18] EPSPDNConnectionModification OPTIONAL

}

-- 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,

 uEEPSPDNConnection [22] UEEPSPDNConnection OPTIONAL,

 ePS5GSComboInfo [23] EPS5GSComboInfo OPTIONAL,

 selectedDNN [24] DNN OPTIONAL,

 handoverState [25] HandoverState OPTIONAL,

 pCCRules [26] PCCRuleSet OPTIONAL,

 ePSPDNConnectionEstablishment [27] EPSPDNConnectionEstablishment 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,

 uEEPSPDNConnection [16] UEEPSPDNConnection OPTIONAL,

 ePS5GSComboInfo [17] EPS5GSComboInfo OPTIONAL,

 handoverState [18] HandoverState OPTIONAL,

 pCCRules [19] PCCRuleSet OPTIONAL,

 uPPathChange [20] UPPathChange OPTIONAL,

 pFDDataForApp [21] PFDDataForApp OPTIONAL,

 ePSPDNConnectionModification [22] EPSPDNConnectionModification 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,

 nGAPCause [11] NGAPCauseInt OPTIONAL,

 fiveGMMCause [12] FiveGMMCause OPTIONAL,

 pCCRuleIDs [13] PCCRuleIDSet OPTIONAL,

 ePSPDNConnectionRelease [14] EPSPDNConnectionRelease 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,

 ePS5GSComboInfo [22] EPS5GSComboInfo OPTIONAL,

 uEEPSPDNConnection [23] UEEPSPDNConnection OPTIONAL,

 pCCRules [24] PCCRuleSet OPTIONAL,

 pFDDataForApps [25] PFDDataForApps OPTIONAL,

 ePSStartOfInterceptionWithEstablishedPDNConnection [26] EPSStartOfInterceptionWithEstablishedPDNConnection 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,

 gTPTunnelInfo [7] GTPTunnelInfo OPTIONAL

}

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

ATSSSContainer ::= OCTET STRING

DLRANTunnelInformation ::= SEQUENCE

{

 dLQOSFlowTunnelInformation [1] QOSFlowTunnelInformation OPTIONAL,

 additionalDLQOSFlowTunnelInformation [2] QOSFlowTunnelInformationList OPTIONAL,

 redundantDLQOSFlowTunnelInformation [3] QOSFlowTunnelInformationList OPTIONAL,

 additionalredundantDLQOSFlowTunnelInformation [4] QOSFlowTunnelInformationList OPTIONAL

}

EstablishmentStatus ::= ENUMERATED

{

 established(0),

 released(1)

}

FiveGSGTPTunnels ::= SEQUENCE

{

 uLNGUUPTunnelInformation [1] FTEID OPTIONAL,

 additionalULNGUUPTunnelInformation [2] FTEIDList OPTIONAL,

 dLRANTunnelInformation [3] DLRANTunnelInformation OPTIONAL

}

FiveQI ::= INTEGER (0..255)

HandoverState ::= ENUMERATED

{

 none(1),

 preparing(2),

 prepared(3),

 completed(4),

 cancelled(5)

}

NGAPCauseInt ::= SEQUENCE

{

 group [1] NGAPCauseGroupInt,

 value [2] NGAPCauseValueInt

}

-- Derived as described in TS 29.571 [17] clause 5.4.4.12

NGAPCauseGroupInt ::= INTEGER

NGAPCauseValueInt ::= INTEGER

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)

}

QOSFlowTunnelInformation ::= SEQUENCE

{

 uPTunnelInformation [1] FTEID,

 associatedQOSFlowList [2] QOSFlowLists

}

QOSFlowTunnelInformationList ::= SEQUENCE OF QOSFlowTunnelInformation

QOSFlowDescription ::= OCTET STRING

QOSFlowLists ::= SEQUENCE OF QOSFlowList

QOSFlowList ::= SEQUENCE

{

 qFI [1] QFI,

 qOSRules [2] QOSRules OPTIONAL,

 eBI [3] EPSBearerID OPTIONAL,

 qOSFlowDescription [4] QOSFlowDescription OPTIONAL,

 qOSFlowProfile [5] QOSFlowProfile OPTIONAL,

 associatedANType [6] AccessType OPTIONAL,

 defaultQOSRuleIndication [7] BOOLEAN OPTIONAL

}

QOSFlowProfile ::= SEQUENCE

{

 fiveQI [1] FiveQI

}

QOSRules ::= OCTET STRING

-- See clauses 5.6.2.6-1 and 5.6.2.9-1 of TS 29.512 [89], clause table 5.6.2.5-1 of TS 29.508 [90] for the details of this structure

PCCRule ::= SEQUENCE

{

 pCCRuleID [1] PCCRuleID OPTIONAL,

 appId [2] UTF8String OPTIONAL,

 flowInfos [3] FlowInformationSet OPTIONAL,

 appReloc [4] BOOLEAN OPTIONAL,

 simConnInd [5] BOOLEAN OPTIONAL,

 simConnTerm [6] INTEGER OPTIONAL,

 maxAllowedUpLat [7] INTEGER OPTIONAL,

 trafficRoutes [8] RouteToLocationSet,

 trafficSteeringPolIdDl [9] UTF8String OPTIONAL,

 trafficSteeringPolIdUl [10] UTF8String OPTIONAL,

 sourceDNAI [11] DNAI OPTIONAL,

 targetDNAI [12] DNAI OPTIONAL,

 dNAIChangeType [13] DNAIChangeType OPTIONAL,

 sourceUEIPAddr [14] IPAddress OPTIONAL,

 targetUEIPAddr [15] IPAddress OPTIONAL,

 sourceTrafficRouting [16] RouteToLocation OPTIONAL,

 targetTrafficRouting [17] RouteToLocation OPTIONAL,

 eASIPReplaceInfos [18] EASIPReplaceInfos OPTIONAL

}

-- See clause table 5.6.2.5-1 of TS 29.508 [90] for the details of this structure.

UPPathChange ::= SEQUENCE

{

 sourceDNAI [1] DNAI OPTIONAL,

 targetDNAI [2] DNAI OPTIONAL,

 dNAIChangeType [3] DNAIChangeType OPTIONAL,

 sourceUEIPAddr [4] IPAddress OPTIONAL,

 targetUEIPAddr [5] IPAddress OPTIONAL,

 sourceTrafficRouting [6] RouteToLocation OPTIONAL,

 targetTrafficRouting [7] RouteToLocation OPTIONAL,

 mACAddress [8] MACAddress OPTIONAL

}

-- See table 5.6.2.14-1 of TS 29.512 [89]

PCCRuleID ::= UTF8String

PCCRuleSet ::= SET OF PCCRule

PCCRuleIDSet ::= SET OF PCCRuleID

FlowInformationSet ::= SET OF FlowInformation

RouteToLocationSet ::= SET OF RouteToLocation

-- See table 5.6.2.14 of TS 29.512 [89]

FlowInformation ::= SEQUENCE

{

 flowDescription [1] FlowDescription OPTIONAL,

 ethFlowDescription [2] EthFlowDescription OPTIONAL,

 tosTrafficClass [3] OCTET STRING (SIZE(2)) OPTIONAL,

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

 flowLabel [5] OCTET STRING (SIZE(3)) OPTIONAL,

 flowDirection [6] FlowDirection OPTIONAL

}

-- See table 5.6.2.14 of TS 29.512 [89]

FlowDescription ::= SEQUENCE

{

 sourceIPAddress [1] IPAddressOrRangeOrAny,

 destinationIPAddress [2] IPAddressOrRangeOrAny,

 sourcePortNumber [3] PortNumber OPTIONAL,

 destinationPortNumber [4] PortNumber OPTIONAL,

 protocol [5] NextLayerProtocolOrAny

}

IPAddressOrRangeOrAny ::= CHOICE

{

 iPAddress [1] IPAddress,

 ipAddressRange [2] IPMask,

 anyIPAddress [3] AnyIPAddress

}

IPMask ::= SEQUENCE

{

 fromIPAddress [1] IPAddress,

 toIPAddress [2] IPAddress

}

AnyIPAddress ::= ENUMERATED

{

 any(1)

}

NextLayerProtocolOrAny ::= CHOICE

{

 nextLayerProtocol [1] NextLayerProtocol,

 anyNextLayerProtocol [2] AnyNextLayerProtocol

}

AnyNextLayerProtocol ::= ENUMERATED

{

 ip(1)

}

-- See table 5.6.2.17-1 of TS 29.514 [91]

EthFlowDescription ::= SEQUENCE

{

 destMacAddress [1] MACAddress OPTIONAL,

 ethType [2] OCTET STRING (SIZE(2)),

 fDesc [3] FlowDescription OPTIONAL,

 fDir [4] FDir OPTIONAL,

 sourceMacAddress [5] MACAddress OPTIONAL,

 vlanTags [6] SET OF VLANTag,

 srcMacAddrEnd [7] MACAddress OPTIONAL,

 destMacAddrEnd [8] MACAddress OPTIONAL

}

-- See table 5.6.2.17-1 of TS 29.514 [91]

FDir ::= ENUMERATED

{

 downlink(1)

}

-- See table 5.6.2.17-1 of TS 29.514 [91]

VLANTag ::= SEQUENCE

{

 priority [1] BIT STRING (SIZE(3)),

 cFI [2] BIT STRING (SIZE(1)),

 vLANID [3] BIT STRING (SIZE(12))

}

-- See table 5.6.2.14 of TS 29.512 [89]

FlowDirection ::= ENUMERATED

{

 downlinkOnly(1),

 uplinkOnly(2),

 dowlinkAndUplink(3)

}

-- See table 5.4.2.1 of TS 29.571 [17]

DNAIChangeType ::= ENUMERATED

{

 early(1),

 earlyAndLate(2),

 late(3)

}

-- See table 5.6.2.15 of TS 29.571 [17]

RouteToLocation ::= SEQUENCE

{

 dNAI [1] DNAI,

 routeInfo [2] RouteInfo

}

-- See table 5.4.2.1 of TS 29.571 [17]

DNAI ::= UTF8String

-- See table 5.4.4.16 of TS 29.571 [17]

RouteInfo ::= SEQUENCE

{

 iPAddressTunnelEndpoint [1] IPAddress,

 uDPPortNumberTunnelEndpoint [2] PortNumber

}

-- See clause 4.1.4.2 of TS 29.512 [89]

EASIPReplaceInfos ::= SEQUENCE

{

 sourceEASAddress [1] EASServerAddress,

 targetEASAddress [2] EASServerAddress

}

-- See clause 4.1.4.2 of TS 29.512 [89]

EASServerAddress ::= SEQUENCE

{

 iPAddress [1] IPAddress,

 port [2] PortNumber

}

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

-- PGW-C + SMF PDNConnection Events

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

EPSPDNConnectionEstablishment ::= SEQUENCE

{

 ePSSubscriberIDs [1] EPSSubscriberIDs,

 iMSIUnauthenticated [2] IMSIUnauthenticatedIndication OPTIONAL,

 defaultBearerID [3] EPSBearerID,

 gTPTunnelInfo [4] GTPTunnelInfo OPTIONAL,

 pDNConnectionType [5] PDNConnectionType,

 uEEndpoints [6] SEQUENCE OF UEEndpointAddress OPTIONAL,

 non3GPPAccessEndpoint [7] UEEndpointAddress OPTIONAL,

 location [8] Location OPTIONAL,

 additionalLocation [9] Location OPTIONAL,

 aPN [10] APN,

 requestType [11] EPSPDNConnectionRequestType OPTIONAL,

 accessType [12] AccessType OPTIONAL,

 rATType [13] RATType OPTIONAL,

 protocolConfigurationOptions [14] PDNProtocolConfigurationOptions OPTIONAL,

 servingNetwork [15] SMFServingNetwork OPTIONAL,

 sMPDUDNRequest [16] SMPDUDNRequest OPTIONAL,

 bearerContextsCreated [17] SEQUENCE OF EPSBearerContextCreated,

 bearerContextsMarkedForRemoval [18] SEQUENCE OF EPSBearerContextForRemoval OPTIONAL,

 indicationFlags [19] PDNConnectionIndicationFlags OPTIONAL,

 handoverIndication [20] PDNHandoverIndication OPTIONAL,

 nBIFOMSupport [21] PDNNBIFOMSupport OPTIONAL,

 fiveGSInterworkingInfo [22] FiveGSInterworkingInfo OPTIONAL,

 cSRMFI [23] CSRMFI OPTIONAL,

 restorationOfPDNConnectionsSupport [24] RestorationOfPDNConnectionsSupport OPTIONAL,

 pGWChangeIndication [25] PGWChangeIndication OPTIONAL,

 pGWRNSI [26] PGWRNSI OPTIONAL

}

EPSPDNConnectionModification ::= SEQUENCE

{

 ePSSubscriberIDs [1] EPSSubscriberIDs,

 iMSIUnauthenticated [2] IMSIUnauthenticatedIndication OPTIONAL,

 defaultBearerID [3] EPSBearerID,

 gTPTunnelInfo [4] GTPTunnelInfo OPTIONAL,

 pDNConnectionType [5] PDNConnectionType,

 uEEndpoints [6] SEQUENCE OF UEEndpointAddress OPTIONAL,

 non3GPPAccessEndpoint [7] UEEndpointAddress OPTIONAL,

 location [8] Location OPTIONAL,

 additionalLocation [9] Location OPTIONAL,

 aPN [10] APN,

 requestType [11] EPSPDNConnectionRequestType OPTIONAL,

 accessType [12] AccessType OPTIONAL,

 rATType [13] RATType OPTIONAL,

 protocolConfigurationOptions [14] PDNProtocolConfigurationOptions OPTIONAL,

 servingNetwork [15] SMFServingNetwork OPTIONAL,

 sMPDUDNRequest [16] SMPDUDNRequest OPTIONAL,

 bearerContextsCreated [17] SEQUENCE OF EPSBearerContextCreated OPTIONAL,

 bearerConcextsModified [18] SEQUENCE OF EPSBearerContextModified,

 bearerContextsMarkedForRemoval [19] SEQUENCE OF EPSBearerContextForRemoval OPTIONAL,

 bearersDeleted [20] SEQUENCE OF EPSBearersDeleted OPTIONAL,

 indicationFlags [21] PDNConnectionIndicationFlags OPTIONAL,

 handoverIndication [22] PDNHandoverIndication OPTIONAL,

 nBIFOMSupport [23] PDNNBIFOMSupport OPTIONAL,

 fiveGSInterworkingInfo [24] FiveGSInterworkingInfo OPTIONAL,

 cSRMFI [25] CSRMFI OPTIONAL,

 restorationOfPDNConnectionsSupport [26] RestorationOfPDNConnectionsSupport OPTIONAL,

 pGWChangeIndication [27] PGWChangeIndication OPTIONAL,

 pGWRNSI [28] PGWRNSI OPTIONAL

}

EPSPDNConnectionRelease ::= SEQUENCE

{

 ePSSubscriberIDs [1] EPSSubscriberIDs,

 iMSIUnauthenticated [2] IMSIUnauthenticatedIndication OPTIONAL,

 defaultBearerID [3] EPSBearerID,

 location [4] Location OPTIONAL,

 gTPTunnelInfo [5] GTPTunnelInfo OPTIONAL,

 rANNASCause [6] EPSRANNASCause OPTIONAL,

 pDNConnectionType [7] PDNConnectionType,

 indicationFlags [8] PDNConnectionIndicationFlags OPTIONAL,

 scopeIndication [9] EPSPDNConnectionReleaseScopeIndication OPTIONAL,

 bearersDeleted [10] SEQUENCE OF EPSBearersDeleted OPTIONAL

}

EPSStartOfInterceptionWithEstablishedPDNConnection ::= SEQUENCE

{

 ePSSubscriberIDs [1] EPSSubscriberIDs,

 iMSIUnauthenticated [2] IMSIUnauthenticatedIndication OPTIONAL,

 defaultBearerID [3] EPSBearerID,

 gTPTunnelInfo [4] GTPTunnelInfo OPTIONAL,

 pDNConnectionType [5] PDNConnectionType,

 uEEndpoints [6] SEQUENCE OF UEEndpointAddress OPTIONAL,

 non3GPPAccessEndpoint [7] UEEndpointAddress OPTIONAL,

 location [8] Location OPTIONAL,

 additionalLocation [9] Location OPTIONAL,

 aPN [10] APN,

 requestType [11] EPSPDNConnectionRequestType OPTIONAL,

 accessType [12] AccessType OPTIONAL,

 rATType [13] RATType OPTIONAL,

 protocolConfigurationOptions [14] PDNProtocolConfigurationOptions OPTIONAL,

 servingNetwork [15] SMFServingNetwork OPTIONAL,

 sMPDUDNRequest [16] SMPDUDNRequest OPTIONAL,

 bearerContexts [17] SEQUENCE OF EPSBearerContext

}

PFDDataForApps ::= SET OF PFDDataForApp

PFDDataForApp ::= SEQUENCE

{

 aPPId [1] UTF8String,

 pFDs [2] PFDs

}

PFDs ::= SET OF PFD

-- See clause 5.6.2.5 of TS 29.551 [96]

PFD ::= SEQUENCE

{

 pFDId [1] UTF8String,

 pFDFlowDescriptions [2] PFDFlowDescriptions,

 urls [3] PFDURLs,

 domainNames [4] DomainNames,

 dnProtocol [5] DnProtocol

}

PFDURLs ::= SET OF UTF8String

PFDFlowDescriptions ::= SET OF PFDFlowDescription

DomainNames ::= SET OF UTF8String

PFDFlowDescription ::= SEQUENCE

{

 nextLayerProtocol [1] NextLayerProtocol,

 serverIPAddress [2] IPAddress,

 serverPortNumber [3] PortNumber

}

-- See clause 5.14.2.2.4 of TS 29.122 [63]

DnProtocol ::= ENUMERATED

{

 dnsQname(1),

 tlsSni(2),

 tlsSan(3),

 tlsScn(4)

}

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

-- PGW-C + SMF Parameters

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

CSRMFI ::= BOOLEAN

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

}

EPSBearerContext ::= SEQUENCE

{

 ePSBearerID [1] EPSBearerID,

 uPGTPTunnelInfo [2] GTPTunnelInfo,

 bearerQOS [3] EPSBearerQOS

}

EPSBearerContextCreated ::= SEQUENCE

{

 ePSBearerID [1] EPSBearerID,

 cause [2] EPSBearerCreationCauseValue,

 gTPTunnelInfo [3] GTPTunnelInfo OPTIONAL,

 bearerQOS [4] EPSBearerQOS OPTIONAL,

 protocolConfigurationOptions [5] PDNProtocolConfigurationOptions OPTIONAL

}

EPSBearerContextModified ::= SEQUENCE

{

 ePSBearerID [1] EPSBearerID,

 cause [2] EPSBearerModificationCauseValue,

 gTPTunnelInfo [3] GTPTunnelInfo OPTIONAL,

 bearerQOS [4] EPSBearerQOS OPTIONAL,

 protocolConfigurationOptions [5] PDNProtocolConfigurationOptions OPTIONAL

}

EPSBearersDeleted ::= SEQUENCE

{

 linkedEPSBearerID [1] EPSBearerID OPTIONAL,

 ePSBearerIDs [2] SEQUENCE OF EPSBearerID OPTIONAL,

 protocolConfigurationOptions [3] PDNProtocolConfigurationOptions OPTIONAL,

 cause [4] EPSBearerDeletionCauseValue OPTIONAL,

 deleteBearerResponse [5] EPSDeleteBearerResponse

}

EPSDeleteBearerResponse ::= SEQUENCE

{

 cause [1] EPSBearerDeletionCauseValue,

 linkedEPSBearerID [2] EPSBearerID OPTIONAL,

 bearerContexts [3] SEQUENCE OF EPSDeleteBearerContext OPTIONAL,

 protocolConfigurationOptions [4] PDNProtocolConfigurationOptions OPTIONAL

}

EPSDeleteBearerContext ::= SEQUENCE

{

 cause [1] EPSBearerDeletionCauseValue,

 ePSBearerID [2] EPSBearerID,

 protocolConfigurationOptions [3] PDNProtocolConfigurationOptions OPTIONAL,

 rANNASCause [4] EPSRANNASCause OPTIONAL

}

EPSBearerContextForRemoval ::= SEQUENCE

{

 ePSBearerID [1] EPSBearerID,

 cause [2] EPSBearerRemovalCauseValue

}

EPSBearerCreationCauseValue ::= INTEGER (0..255)

EPSBearerDeletionCauseValue ::= INTEGER (0..255)

EPSBearerModificationCauseValue ::= INTEGER (0..255)

EPSBearerRemovalCauseValue ::= INTEGER (0..255)

EPSBearerQOS ::= SEQUENCE

{

 qCI [1] QCI OPTIONAL,

 maximumUplinkBitRate [2] BitrateBinKBPS OPTIONAL,

 maximumDownlinkBitRate [3] BitrateBinKBPS OPTIONAL,

 guaranteedUplinkBitRate [4] BitrateBinKBPS OPTIONAL,

 guaranteedDownlinkBitRate [5] BitrateBinKBPS OPTIONAL,

 priorityLevel [6] EPSQOSPriority OPTIONAL

}

EPSRANNASCause ::= OCTET STRING

EPSQOSPriority ::= INTEGER (1..15)

BitrateBinKBPS ::= OCTET STRING

EPSGTPTunnels ::= SEQUENCE

{

 controlPlaneSenderFTEID [1] FTEID OPTIONAL,

 controlPlanePGWS5S8FTEID [2] FTEID OPTIONAL,

 s1UeNodeBFTEID [3] FTEID OPTIONAL,

 s5S8SGWFTEID [4] FTEID OPTIONAL,

 s5S8PGWFTEID [5] FTEID OPTIONAL,

 s2bUePDGFTEID [6] FTEID OPTIONAL,

 s2aUePDGFTEID [7] FTEID OPTIONAL

}

EPSPDNConnectionRequestType ::= ENUMERATED

{

 initialRequest(1),

 handover(2),

 rLOS(3),

 emergency(4),

 handoverOfEmergencyBearerServices(5),

 reserved(6)

}

EPSPDNConnectionReleaseScopeIndication ::= BOOLEAN

FiveGSInterworkingInfo ::= SEQUENCE

{

 fiveGSInterworkingIndicator [1] FiveGSInterworkingIndicator,

 fiveGSInterworkingWithoutN26 [2] FiveGSInterworkingWithoutN26,

 fiveGCNotRestrictedSupport [3] FiveGCNotRestrictedSupport

}

FiveGSInterworkingIndicator ::= BOOLEAN

FiveGSInterworkingWithoutN26 ::= BOOLEAN

FiveGCNotRestrictedSupport ::= BOOLEAN

PDNConnectionIndicationFlags ::= OCTET STRING

PDNHandoverIndication ::= BOOLEAN

PDNNBIFOMSupport ::= BOOLEAN

PDNProtocolConfigurationOptions ::= SEQUENCE

{

 requestPCO [1] PDNPCO OPTIONAL,

 requestAPCO [2] PDNPCO OPTIONAL,

 requestEPCO [3] PDNPCO OPTIONAL,

 responsePCO [4] PDNPCO OPTIONAL,

 responseAPCO [5] PDNPCO OPTIONAL,

 responseEPCO [6] PDNPCO OPTIONAL

}

PDNPCO ::= OCTET STRING

PGWChangeIndication ::= BOOLEAN

PGWRNSI ::= BOOLEAN

QCI ::= INTEGER (0..255)

GTPTunnelInfo ::= SEQUENCE

{

 fiveGSGTPTunnels [1] FiveGSGTPTunnels OPTIONAL,

 ePSGTPTunnels [2] EPSGTPTunnels OPTIONAL

}

RestorationOfPDNConnectionsSupport ::= BOOLEAN

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

-- 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,

 roamingIndicator [9] RoamingIndicator 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,

 aMFDeregistrationInfo [7] UDMAMFDeregistrationInfo OPTIONAL,

 deregistrationData [8] UDMDeregistrationData OPTIONAL

}

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

}

UDMStartOfInterceptionWithRegisteredTarget ::= SEQUENCE

{

 sUPI [1] SUPI,

 gPSI [2] GPSI OPTIONAL,

 uDMSubscriptionDataSets [3] SBIType

}

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

-- 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

}

RoamingIndicator ::= BOOLEAN

UDMAMFDeregistrationInfo ::= SEQUENCE

{

 gUAMI [1] GUAMI,

 purgeFlag [2] BOOLEAN

}

UDMDeregistrationData ::= SEQUENCE

{

 deregReason [1] UDMDeregReason OPTIONAL,

 accessType [2] AccessType OPTIONAL,

 pDUSessionID [3] PDUSessionID OPTIONAL

}

UDMDeregReason ::= ENUMERATED

{

 uEInitialRegistration(1),

 uERegistrationAreaChange(2),

 subscriptionWithdrawn(3),

 fiveGSToEPSMobility(4),

 fiveGSToEPSMobilityUeInitialRegistration(5),

 reregistrationRequired(6),

 sMFContextTransferred(7),

 duplicatePDUSession(8),

 fiveGSRVCCToUTRANMobility(9)

}

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

-- 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,

 accessNetworkInformation [7] SEQUENCE OF SIPAccessNetworkInformation OPTIONAL,

 cellularNetworkInformation [8] SEQUENCE OF SIPCellularNetworkInformation 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,

 accessNetworkInformation [8] SEQUENCE OF SIPAccessNetworkInformation OPTIONAL,

 cellularNetworkInformation [9] SEQUENCE OF SIPCellularNetworkInformation OPTIONAL

}

-- See clause 7.12.4.2.3 for the details.

IMSCCUnavailable ::= SEQUENCE

{

 cCUnavailableReason [1] UTF8String,

 sDPState [2] OCTET STRING OPTIONAL

}

-- =========

-- IMS CCPDU

-- =========

IMSCCPDU ::= SEQUENCE

{

 payload [1] IMSCCPDUPayload,

 sDPInfo [2] OCTET STRING OPTIONAL

}

IMSCCPDUPayload ::= OCTET STRING

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

-- 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

}

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

-- EES definitions

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

-- See clause 7.14.2.2 for details of this structure

EESEECRegistration ::= SEQUENCE

{

 registrationType [1] RegistrationType,

 eECID [2] UTF8String,

 gPSI [3] GPSI OPTIONAL,

 aCProfiles [4] ACProfiles OPTIONAL,

 eECServiceContSupport [5] ACRScenarios OPTIONAL,

 expirationTime [6] Timestamp OPTIONAL,

 eECContextID [7] UTF8String OPTIONAL,

 srcEESID [8] UTF8String OPTIONAL,

 unfulfilledACProfiles [9] UnfulfilledACProfiles OPTIONAL,

 failureResponse [10] FailureResponse OPTIONAL

}

-- See clause 7.14.2.3 for details of this structure

EESEASDiscovery ::= SEQUENCE

{

 eECID [1] UTF8String,

 gPSI [2] GPSI OPTIONAL,

 eASDiscoveryFilter [3] EASDiscoveryFilter OPTIONAL,

 eECServiceContSupport [4] ACRScenarios OPTIONAL,

 uELocation [5] Location OPTIONAL,

 eASTargetDNAIs [6] DNAIs OPTIONAL,

 discoveredEAS [7] DiscoveredEAS OPTIONAL,

 failureResponse [8] FailureResponse OPTIONAL

}

-- See clause 7.14.2.4 for details of this structure

EESEASDiscoverySubscription ::= SEQUENCE

{

 eECID [1] UTF8String,

 gPSI [2] GPSI OPTIONAL,

 subscriptionType [3] SubscriptionType,

 eASEventType [4] EASEventType,

 eASDiscoveryFilter [5] EASDiscoveryFilter OPTIONAL,

 eASDynamicInfoFilter [6] EASDynamicInfoFilter OPTIONAL,

 eECServiceContSupport [7] ACRScenarios OPTIONAL,

 expirationTime [8] Timestamp OPTIONAL,

 subscriptionId [9] UTF8String OPTIONAL,

 failureResponse [10] FailureResponse OPTIONAL

}

-- See clause 7.14.2.5 for details of this structure

EESEASDiscoveryNotification ::= SEQUENCE

{

 subscriptionID [1] UTF8String,

 eventType [2] EASEventType,

 discoveredEAS [3] DiscoveredEAS,

 failureResponse [4] FailureResponse OPTIONAL

}

-- See clause 7.14.2.6 for details of this structure

EESAppContextRelocation ::= SEQUENCE

{

 eECID [1] UTF8String,

 gPSI [2] GPSI OPTIONAL,

 eESACRDetOrInit [3] EESACRDetOrInit

}

EESACRDetOrInit ::= CHOICE

{

 aCRDetermineReq [1] ACRDetermineReq,

 aCRInitiateReq [2] ACRInitiateReq

}

ACRDetermineReq ::= SEQUENCE

{

 eASID [1] EASID OPTIONAL,

 aCID [2] ACID OPTIONAL,

 sEASEndpoint [3] EASEndpoint

}

ACRInitiateReq ::= SEQUENCE

{

 eASID [1] EASID OPTIONAL,

 aCID [2] ACID OPTIONAL,

 tEASEndpoint [3] EASEndpoint,

 sEASEndpoint [4] EASEndpoint OPTIONAL,

 previousTEASEndpoint [5] EASEndpoint OPTIONAL,

 routeReq [6] RouteToLocation OPTIONAL

}

-- See clause 7.14.2.7 for details of this structure

EESACRSubscription ::= SEQUENCE

{

 eECID [1] UTF8String,

 gPSI [2] GPSI OPTIONAL,

 subscriptionType [3] SubscriptionType,

 expirationTime [4] Timestamp OPTIONAL,

 eASIDs [5] EASIDs,

 aCIDs [6] ACIDs OPTIONAL,

 eventIDs [7] ACREventIDs OPTIONAL,

 subscriptionId [8] UTF8String OPTIONAL,

 failureResponse [9] FailureResponse OPTIONAL

}

-- See clause 7.14.2.8 for details of this structure

EESACRNotification ::= SEQUENCE

{

 subscriptionID [1] UTF8String,

 eASID [2] EASID,

 eventID [3] ACREventIDs,

 targetInfo [4] TargetInfo OPTIONAL,

 aCRRes [5] BOOLEAN OPTIONAL,

 failReason [6] UTF8String OPTIONAL

}

-- See clause 7.14.2.9 for details of this structure

EESEECContextRelocation ::= SEQUENCE

{

 eECID [1] UTF8String,

 eECContextID [2] UTF8String,

 gPSI [3] GPSI OPTIONAL,

 uELoc [4] Location OPTIONAL,

 aCProfiles [5] ACProfiles OPTIONAL

}

-- See clause 7.14.2.10 for details of this structure

EESStartOfInterceptionWithRegisteredEEC ::= SEQUENCE

{

 eECID [1] UTF8String,

 gPSI [2] GPSI OPTIONAL,

 aCProfiles [3] ACProfiles OPTIONAL,

 eECServiceContSupport [4] ACRScenarios OPTIONAL,

 expirationTime [5] Timestamp OPTIONAL,

 eECContextID [6] UTF8String OPTIONAL,

 srcEESID [7] UTF8String OPTIONAL,

 unfulfilledACProfiles [8] UnfulfilledACProfiles OPTIONAL,

 timeOfRegistration [9] Timestamp OPTIONAL

}

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

-- EES parameters

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

RegistrationType ::= ENUMERATED

{

 registration (1),

 registrationUpdate(2),

 deregistration(3)

}

ACProfiles ::= SET OF ACProfile

ACProfile ::= SEQUENCE

{

 aCID [1] ACID,

 aCType [2] UTF8String OPTIONAL,

 aCSchedule [3] Daytime OPTIONAL,

 expACGeoServArea [4] Location OPTIONAL,

 eASsInfo [5] EASsInfo OPTIONAL,

 aCServiceContSupport [6] ACRScenarios OPTIONAL

}

ACID ::= UTF8String

ACRScenarios ::= SET OF ACRScenario

ACRScenario ::= ENUMERATED

{

 eECInitiated(1),

 eECExecutedViaSourceEES(2),

 eECExecutedViaTargetEES(3),

 sourceEASDecided(4),

 sourceEESExecuted(5),

 eELManagedACR(6)

}

UnfulfilledACProfiles ::= SET OF UnfulfilledACProfile

UnfulfilledACProfile ::= SEQUENCE

{

 aCID [1] ACID,

 reason [2] UnfulfilledACProfileReason

}

UnfulfilledACProfileReason ::= ENUMERATED

{

 eASNotAvailable(1),

 requirementsUnfulfilled(2)

}

EASID ::= UTF8String

EASsInfo ::= SET OF EASInfo

EASInfo ::= SEQUENCE

{

 eASID [1] EASID,

 expectedSvcKPIs [2] ServiceKPIs OPTIONAL,

 minimumReqSvcKPIs [3] ServiceKPIs OPTIONAL

}

ServiceKPIs ::= SEQUENCE

{

 connectionBandwidth [1] INTEGER OPTIONAL,

 requestRate [2] INTEGER OPTIONAL,

 responseTime [3] INTEGER OPTIONAL,

 requestedAvailability [4] INTEGER OPTIONAL,

 requestedCompute [5] OCTET STRING OPTIONAL,

 requestedGraphCompute [6] OCTET STRING OPTIONAL,

 requestedMemory [7] OCTET STRING OPTIONAL,

 requestedStorage [8] OCTET STRING OPTIONAL

}

FailureResponse ::= ENUMERATED

{

 error400(1),

 error401(2),

 error403(3),

 error404(4),

 error406(5),

 error411(6),

 error413(7),

 error415(8),

 error429(9),

 error500(10),

 error503(11)

}

EASDiscoveryFilter ::= CHOICE

{

 aCsCharacteristics [1] ACProfiles,

 eASCharacteristics [2] EASsCharacteristics

}

EASsCharacteristics ::= SET OF EASCharacteristics

EASCharacteristics ::= SEQUENCE

{

 eASID [1] EASID OPTIONAL,

 aSPID [2] UTF8String OPTIONAL,

 eASType [3] UTF8String OPTIONAL,

 eASSchedule [4] Daytime OPTIONAL,

 eASProfile [5] EASProfile OPTIONAL,

 eASServiceArea [6] Location OPTIONAL,

 eASServicePermLevel [7] UTF8String OPTIONAL,

 eASServiceFeatures [8] EASServiceFeatures OPTIONAL

}

DNAIs ::= SET OF DNAI

DiscoveredEAS ::= SEQUENCE

{

 eASProfile [1] EASProfile,

 lifetime [2] INTEGER OPTIONAL

}

EASProfile ::= SEQUENCE

{

 eASID [1] EASID,

 eASEndpoint [2] EASEndpoint,

 aCIDs [3] ACIDs OPTIONAL,

 aSPID [4] UTF8String OPTIONAL,

 eASType [5] UTF8String OPTIONAL,

 eASDescription [6] UTF8String OPTIONAL,

 eASSchedule [7] Daytime OPTIONAL,

 eASServiceArea [8] Location OPTIONAL,

 eASServiceKPIs [9] ServiceKPIs OPTIONAL,

 eASServicePermLevel [10] UTF8String OPTIONAL,

 eASServiceFeatures [11] EASServiceFeatures OPTIONAL,

 eASServiceContSupport [12] ACRScenarios OPTIONAL,

 appLocs [13] RouteToLocations OPTIONAL,

 eASStatus [14] EASStatus OPTIONAL

}

EASStatus ::= ENUMERATED

{

 enabled(1),

 disabled(2)

}

EASEndpoint ::= SEQUENCE

{

 fQDN [1] FQDN OPTIONAL,

 iPv4Addresses [2] IPv4Addresses OPTIONAL,

 iPv6Addresses [3] IPv6Addresses OPTIONAL,

 uRI [4] UTF8String OPTIONAL

}

RouteToLocations ::= SET OF RouteToLocation

EASServiceFeatures ::= SET OF EASServiceFeature

EASServiceFeature ::= UTF8String

ACIDs ::= SET OF ACID

IPv4Addresses ::= SET OF IPv4Address

IPv6Addresses ::= SET OF IPv6Address

SubscriptionType ::= ENUMERATED

{

 subscription(1),

 subscriptionUpdate(2),

 unsubscription(3)

}

EASEventType ::= ENUMERATED

{

 eASAvailabilityChange(1),

 eASDynamicInfoChange(2)

}

EASDynamicInfoFilter ::= SEQUENCE

{

 eASId [1] EASID,

 eASStatus [2] BOOLEAN,

 eASAcIDs [3] BOOLEAN,

 eASDesc [4] BOOLEAN,

 eASPt [5] BOOLEAN,

 eASFeature [6] BOOLEAN,

 eASSchedule [7] BOOLEAN,

 eASSvcArea [8] BOOLEAN,

 eASSvcKpi [9] BOOLEAN,

 eASSvcCont [10] BOOLEAN

}

EASIDs ::= SET OF EASID

ACREventIDs ::= ENUMERATED

{

 targetInformation(1),

 aCRComplete(2)

}

TargetInfo ::= SEQUENCE

{

 discoveredEAS [1] DiscoveredEAS,

 targetEESInfo [2] EDNConfigurationInfo OPTIONAL

}

EDNConfigurationInfo ::= SEQUENCE

{

 eDNConnectionInfo [1] EDNConnectionInfo,

 eESsInfo [2] EESsInfo,

 lifetime [3] INTEGER OPTIONAL

}

EDNConnectionInfo ::= SEQUENCE

{

 dNN [1] DNN OPTIONAL,

 sNSSAI [2] SNSSAI OPTIONAL,

 serviceArea [3] Location OPTIONAL

}

EESsInfo ::= SET OF EESInfo

EESInfo ::= SEQUENCE

{

 eESID [1] EESID,

 eESEndpoint [2] EESEndpoint,

 eASIDs [3] EASIDs OPTIONAL,

 serviceArea [4] Location OPTIONAL,

 dNAIS [5] DNAIs OPTIONAL

}

EESID ::= UTF8String

EESEndpoint ::= SEQUENCE

{

 fQDN [1] FQDN OPTIONAL,

 iPv4Addresses [2] IPv4Addresses OPTIONAL,

 iPv6Addresses [3] IPv6Addresses OPTIONAL,

 uRI [4] UTF8String OPTIONAL

}

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

-- 5GMS AF definitions

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

-- See clause 7.15.2.2 for details of this structure

FiveGMSAFServiceAccessInformation ::= SEQUENCE

{

 gPSI [1] GPSI,

 serviceAccessInformationResource [2] SBIType

}

-- See clause 7.15.2.3 for details of this structure

FiveGMSAFConsumptionReporting ::= SEQUENCE

{

 gPSI [1] GPSI,

 consumptionReport [2] SBIType

}

-- See clause 7.15.2.4 for details of this structure

FiveGMSAFDynamicPolicyInvocation ::= SEQUENCE

{

 gPSI [1] GPSI,

 dynamicPolicyResource [2] SBIType,

 dPIoperationType [3] DPIOperationType

}

-- See clause 7.15.2.5 for details of this structure

FiveGMSAFMetricsReporting ::= SEQUENCE

{

 gPSI [1] GPSI,

 metricsReport [2] XMLType

}

-- See clause 7.15.2.6 for details of this structure

FiveGMSAFNetworkAssistance ::= SEQUENCE

{

 gPSI [1] GPSI,

 networkAssistanceSessionResource [2] SBIType,

 nAOperationType [3] NAOperationType

}

-- See clause 7.15.2.7 for details of this structure

FiveGMSAFUnsuccessfulProcedure ::= SEQUENCE

{

 gPSI [1] GPSI,

 fiveGMSAFUnsuccessfulOperation [2] FiveGMSAFUnsuccessfulOperation,

 fiveGMSAFErrorCode [3] FiveGMSAFErrorCode

}

-- See clause 7.15.2.8 for details of this structure

FiveGMSAFStartOfInterceptionWithAlreadyConfiguredUE ::= SEQUENCE

{

 gPSI [1] GPSI,

 serviceAccessInformationResource [2] SBIType

}

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

-- 5GMS AF parameters

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

DPIOperationType ::= ENUMERATED

{

 createDynamicPolicy(1),

 retrieveDynamicPolicy(2),

 updateDynamicPolicy(3),

 patchDynamicPolicy(4),

 destroyDynamicPolicy(5)

}

NAOperationType ::= ENUMERATED

{

 createNetworkAssistanceSession(1),

 retrieveNetworkAssistanceSession(2),

 updateNetworkAssistanceSession(3),

 patchNetworkAssistanceSession(4),

 destroyNetworkAssistanceSession(5),

 requestBitRateRecommendation(6),

 requestDeliveryBoost(7)

}

FiveGMSAFUnsuccessfulOperation::= ENUMERATED

{

 retrieveServiceAccessInformation(1),

 submitConsumptionReport(2),

 submitMetricsReport(3),

 createDynamicPolicy(4),

 retrieveDynamicPolicy(5),

 updateDynamicPolicy(6),

 patchDynamicPolicy(7),

 destroyDynamicPolicy(8),

 createNetworkAssistanceSession(9),

 retrieveNetworkAssistanceSession(10),

 updateNetworkAssistanceSession(11),

 patchNetworkAssistanceSession(12),

 destroyNetworkAssistanceSession(13),

 requestBitRateRecommendation(14),

 requestDeliveryBoost(15)

}

FiveGMSAFErrorCode ::=ENUMERATED

{

 badRequest400(1),

 unauthorized401(2),

 notFound404(3),

 unsupportedMediaType415(4)

}

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

-- 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,

 useSessionTrigger [14] BOOLEAN

}

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

-- 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

}

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

-- HSS definitions

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

HSSServingSystemMessage ::= SEQUENCE

{

 iMSI [1] IMSI,

 oldPLMNID [2] PLMNID,

 newPLMNID [3] PLMNID,

 roamingIndicator [4] RoamingIndicator,

 responseCodes [5] UTF8String

}

HSSStartOfInterceptionWithRegisteredTarget ::= SEQUENCE

{

 hSSIdentities [1] HSSIdentities,

 subscriptionDataSets [2] SubscriptionDataSets,

 pSUserState [3] SBIType

}

HSSIdentities ::= SEQUENCE

{

 ePSSubscriberIDs [1] EPSSubscriberIDs OPTIONAL,

 iMSSubscriberIDs [2] IMSSubscriberIDs OPTIONAL

}

SubscriptionDataSets ::= CHOICE

{

 iMSSubscriptionData [1] SBIType

}

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

-- Common Parameters

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

AccessType ::= ENUMERATED

{

 threeGPPAccess(1),

 nonThreeGPPAccess(2),

 threeGPPandNonThreeGPPAccess(3)

}

AllowedNSSAI ::= SEQUENCE OF NSSAI

AllowedTACs ::= SEQUENCE (SIZE(1..MAX)) OF TAC

AreaOfInterest ::= SEQUENCE

{

 areaOfInterestTAIList [1] AreaOfInterestTAIList OPTIONAL,

 areaOfInterestCellList [2] AreaOfInterestCellList OPTIONAL,

 areaOfInterestRANNodeList [3] AreaOfInterestRANNodeList OPTIONAL

}

AreaOfInterestCellList ::= SEQUENCE (SIZE(1..MAX)) OF NCGI

AreaOfInterestItem ::= SEQUENCE

{

 areaOfInterest [1] AreaOfInterest

}

AreaOfInterestRANNodeList ::= SEQUENCE (SIZE(1..MAX)) OF GlobalRANNodeID

AreaOfInterestTAIList ::= SEQUENCE (SIZE(1..MAX)) OF TAI

CellCAGList ::= SEQUENCE (SIZE(1..MAX)) OF CAGID

CauseMisc ::= ENUMERATED

{

 controlProcessingOverload(1),

 notEnoughUserPlaneProcessingResources(2),

 hardwareFailure(3),

 oMIntervention(4),

 unknownPLMNOrSNPN(5),

 unspecified(6)

}

CauseNas ::= ENUMERATED

{

 normalRelease(1),

 authenticationFailure(2),

 deregister(3),

 unspecified(4)

}

CauseProtocol ::= ENUMERATED

{

 transferSyntaxError(1),

 abstractSyntaxError-reject(2),

 abstractSyntaxErrorIgnoreAndNotify(3),

 messageNotCompatibleWithReceiverState(4),

 semanticError(5),

 abstractSyntaxErrorFalselyConstructedMessage(6),

 unspecified(7)

}

CauseRadioNetwork ::= ENUMERATED

{

 unspecified(1),

 txnrelocoverallExpiry(2),

 successfulHandover(3),

 releaseDueToNGRANGeneratedReason(4),

 releaseDueTo5gcGeneratedReason(5),

 handoverCancelled(6),

 partialHandover(7),

 hoFailureInTarget5GCNGRANNodeOrTargetSystem(8),

 hoTargetNotAllowed(9),

 tNGRelocOverallExpiry(10),

 tNGRelocPrepExpiry(11),

 cellNotAvailable(12),

 unknownTargetID(13),

 noRadioResourcesAvailableInTargetCell(14),

 unknownLocalUENGAPID(15),

 inconsistentRemoteUENGAPID(16),

 handoverDesirableForRadioReason(17),

 timeCriticalHandover(18),

 resourceOptimisationHandover(19),

 reduceLoadInServingCell(20),

 userInactivity(21),

 radioConnectionWithUELost(22),

 radioResourcesNotAvailable(23),

 invalidQoSCombination(24),

 failureInRadioInterfaceProcedure(25),

 interactionWithOtherProcedure(26),

 unknownPDUSessionID(27),

 multiplePDUSessionIDInstances(29),

 multipleQoSFlowIDInstances(30),

 encryptionAndOrIntegrityProtectionAlgorithmsNotSupported(31),

 nGIntraSystemHandoverTriggered(32),

 nGInterSystemHandoverTriggered(33),

 xNHandoverTriggered(34),

 notSupported5QIValue(35),

 uEContextTransfer(36),

 iMSVoiceeEPSFallbackOrRATFallbackTriggered(37),

 uPIntegrityProtectioNotPossible(38),

 uPConfidentialityProtectionNotPossible(39),

 sliceNotSupported(40),

 uEInRRCInactiveStateNotReachable(41),

 redirection(42),

 resourcesNotAvailableForTheSlice(43),

 uEMaxIntegrityProtectedDataRateReason(44),

 releaseDueToCNDetectedMobility(45),

 n26InterfaceNotAvailable(46),

 releaseDueToPreemption(47),

 multipleLocationReportingReferenceIDInstances(48),

 rSNNotAvailableForTheUP(49),

 nPMAccessDenied(50),

 cAGOnlyAccessDenied(51),

 insufficientUECapabilities(52)

}

CauseTransport ::= ENUMERATED

{

 transportResourceUnavailable(1),

 unspecified(2)

}

Direction ::= ENUMERATED

{

 fromTarget(1),

 toTarget(2)

}

DNN ::= UTF8String

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

EmailAddress ::= UTF8String

EquivalentPLMNs ::= SEQUENCE (SIZE(1..MAX)) OF PLMNID

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)

FiveGSSubscriberID ::= CHOICE

{

 sUPI [1] SUPI,

 sUCI [2] SUCI,

 pEI [3] PEI,

 gPSI [4] GPSI

}

FiveGSSubscriberIDs ::= SEQUENCE

{

 fiveGSSubscriberID [1] SEQUENCE SIZE(1..MAX) OF FiveGSSubscriberID

}

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)

}

ForbiddenAreaInformation ::= SEQUENCE

{

 pLMNIdentity [1] PLMNID,

 forbiddenTACs [2] ForbiddenTACs

}

ForbiddenTACs ::= SEQUENCE (SIZE(1..MAX)) OF TAC

FTEID ::= SEQUENCE

{

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

 iPv4Address [2] IPv4Address OPTIONAL,

 iPv6Address [3] IPv6Address OPTIONAL

}

FTEIDList ::= SEQUENCE OF FTEID

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

}

HandoverCause ::= CHOICE

{

 radioNetwork [1] CauseRadioNetwork,

 transport [2] CauseTransport,

 nas [3] CauseNas,

 protocol [4] CauseProtocol,

 misc [5] CauseMisc

}

HandoverType ::= ENUMERATED

{

 intra5GS(1),

 fiveGStoEPS(2),

 ePSto5GS(3),

 fiveGStoUTRA(4)

}

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))

IMSIUnauthenticatedIndication ::= BOOLEAN

IMSSubscriberIDs ::= CHOICE

{

 iMPI [1] IMPI,

 iMPU [2] IMPU

}

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)

LocationAreaOfInterestList ::= SEQUENCE (SIZE(1..MAX)) OF AreaOfInterestItem

LocationEventType ::= ENUMERATED

{

 direct(1),

 changeOfServeCell(2),

 uEPrescenceInAreaOfInterest(3),

 stopChangeOfServeCell(4),

 stopUEPresenceInAreaOfInterest(5),

 cancelLocationReportingForTheUE(6)

}

LocationReportArea ::= ENUMERATED

{

 cell(1)

}

LocationReportingRequestType ::= SEQUENCE

{

 eventType [1] LocationEventType,

 reportArea [2] LocationReportArea,

 areaOfInterestList [3] LocationAreaOfInterestList

}

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

MobilityRestrictionList ::= SEQUENCE

{

 servingPLMN [1] PLMNID,

 equivalentPLMNs [2] EquivalentPLMNs OPTIONAL,

 rATRestrictions [3] RATRestrictions OPTIONAL,

 forbiddenAreaInformation [4] ForbiddenAreaInformation OPTIONAL,

 serviceAreaInformation [5] ServiceAreaInformation OPTIONAL

}

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

NAI ::= UTF8String

NextLayerProtocol ::= INTEGER(0..255)

NonLocalID ::= ENUMERATED

{

 local(1),

 nonLocal(2)

}

NonIMEISVPEI ::= CHOICE

{

 mACAddress [1] MACAddress,

 eUI64 [2] EUI64

}

NPNAccessInformation ::= CHOICE

{

 pNINPNAccessInformation [1] CellCAGList

}

NSSAI ::= SEQUENCE OF SNSSAI

PagingRestrictionIndicator ::= OCTET STRING (SIZE(1..33))

PLMNID ::= SEQUENCE

{

 mCC [1] MCC,

 mNC [2] MNC

}

PLMNList ::= SEQUENCE (SIZE(1..MAX)) OF PLMNID

PDNConnectionType ::= ENUMERATED

{

 iPv4(1),

 iPv6(2),

 iPv4v6(3),

 nonIP(4),

 ethernet(5)

}

PDUSessionID ::= INTEGER (0..255)

PDUSessionResourceInformation ::= SEQUENCE

{

 pDUSessionID [1] PDUSessionID

}

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)

RANUENGAPID ::= INTEGER (0..4294967295)

-- See clause 9.3.1.20 of TS 38.413 [23] for details

RANSourceToTargetContainer ::= OCTET STRING

-- See clause 9.3.1.21 of TS 38.413 [23] for details

RANTargetToSourceContainer ::= OCTET STRING

RATRestrictions ::= SEQUENCE (SIZE(1..MAX)) OF RATRestrictionItem

RATRestrictionInformation ::= BIT STRING (SIZE(8, ...))

RATRestrictionItem ::= SEQUENCE

{

 pLMNIdentity [1] PLMNID,

 rATRestrictionInformation [2] RATRestrictionInformation

}

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)

-- Details for the encoding and use of this parameter may be found in the clause

-- that defines the xIRI that carries it. This parameter provides a generic

-- mechanism to convey service based interface structures defined in Stage 3 working groups.

SBIType ::= SEQUENCE

{

 sBIReference [1] SBIReference,

 sBIValue [2] SBIValue

}

SBIReference ::= UTF8String

SBIValue ::= UTF8String

SchemeOutput ::= OCTET STRING

ServiceAreaInformation ::= SEQUENCE (SIZE(1..MAX)) OF ServiceAreaInfo

ServiceAreaInfo ::= SEQUENCE

{

 pLMNIdentity [1] PLMNID,

 allowedTACs [2] AllowedTACs OPTIONAL,

 notAllowedTACs [3] ForbiddenTACs OPTIONAL

}

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,

 iMPU [11] IMPU,

 iMPI [12] IMPI,

 e164Number [13] E164Number,

 emailAddress [14] EmailAddress,

 mCPTTID [15] UTF8String,

 instanceIdentifierURN [16] UTF8String,

 pTCChatGroupID [17] PTCChatGroupID

}

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

}

UserIdentifiers ::= SEQUENCE

{

 fiveGSSubscriberIDs [1] FiveGSSubscriberIDs OPTIONAL,

 ePSSubscriberIDs [2] EPSSubscriberIDs OPTIONAL

}

XMLType ::= SEQUENCE

{

 xMLNamespace [1] XMLNamespace,

 xMLValue [2] XMLValue

}

XMLNamespace ::= UTF8String

XMLValue ::= UTF8String

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

-- 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..327675)

AgeOfLocationEstimate ::= INTEGER (0..32767)

HorizontalSpeed ::= UTF8String

VerticalSpeed ::= UTF8String

SpeedUncertainty ::= UTF8String

BarometricPressure ::= INTEGER (30000..115000)

-- 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)

SIPAccessNetworkInformation ::= SEQUENCE

{

 accessNetworkInfo [1] UTF8String,

 servingPLMN [2] PLMNID OPTIONAL

}

SIPCellularNetworkInformation ::= SEQUENCE

{

 cellularNetworkInfo [1] UTF8String,

 servingPLMN [2] PLMNID OPTIONAL

}

END

## \*\*\*\* END OF ATTACHMENT CHANGES \*\*\*

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