**3GPP TSG- Meeting #**

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| --- |
| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  |  | **CR** |  | **rev** | **1** | **Current version:** |  |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

|  |
| --- |
|  |
| ***Title:***  |  |
|  |  |
| ***Source to WG:*** | SA3-LI () |
| ***Source to TSG:*** | SA3 |
|  |  |
| ***Work item code:*** |  |  | ***Date:*** | 10-06 |
|  |  |  |  |  |
| ***Category:*** |  |  | ***Release:*** |  |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
|  |  |
| ***Reason for change:*** | Currently, there is no support in 33.128 for reporting start of interception for a UE already registered at the UDM. There is also some confusion regarding the use of the UDM Cancel Location xIRI. This CR adds the missing capaiblity and expands the cancel location xIRI to include de-registration information that is currently missing. |
|  |  |
| ***Summary of change:*** | Addition of text to existing clause 7.2.2.3.4, Addition of new clause, 7.2.2.3.X, and associated ASN.1 |
|  |  |
| ***Consequences if not approved:*** | The specfiication will remain incomplete and unable to report all available infromation from the IRI-POI in the UDM. LI reporting will be incomplete. |
|  |  |
| ***Clauses affected:*** | 7.2.2.3.4, 7.2.2.3.X, Annex A |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** | ASN.1 for this CR can be found in Forge:<https://forge.3gpp.org/rep/sa3/li/-/merge_requests/100/diffs?commit_id=6f543536a4f789cbd92b032202f452937227c8ca> Commit hash: 6f543536a4f789cbd92b032202f452937227c8ca |
|  |  |
| ***This CR's revision history:*** | S3i220528 |

START OF CHANGES

START OF FIRST CHANGE

7.2.2.3.4 Cancel location

The IRI-POI in the UDM shall generate an xIRI containing the UDMCancelLocation record when it detects the following events:

- When the UDM sends DeregistrationData to AMF as part of the Nudm\_UEContextManagement DeregistrationNotification service operation (see TS 29.503 [25] clause 5.3.2.3.2) to cancel location retrieval operations.

- When the UDM receives the Amf3GppAccessRegistrationModification with PurgeFlag set to true from the AMF as part of Nudm\_UEContextManagement Deregistration service operation (see TS 29.503 [25] clause 5.3.2.4.2).

- When UDM receives the AmfNon3GppAccessRegistrationModification with PurgeFlag set to true from the AMF as part of Nudm\_UEContextManagement Deregistration service operation (see TS 29.503 [25] clause 5.3.2.4.3).

When a target UE deregisters from both 3GPP and non-3GPP access, two separate xIRIs each containing the UDMCancelLocation report record may be generated by the IRI-POI in the UDM.

NOTE: Invocation of the Nudm\_UEContextManagement Deregistration service operation in the case of UE deregistration is an implementation option (see TS 23.502 [4], clause 4.5.3). Consequently, the UDMCancel Location xIRI in such case is only generated if this option is supported by the serving network.

**Table 7.2.2.3.4-1: Payload for UDMCancelLocationMessage record**

|  |  |  |
| --- | --- | --- |
| **Field name** | **Description** | **M/C/O** |
| sUPI | SUPI associated with the target UE, see TS 29.571 [17]. | M |
| pEI | PEI associated with the target UE, when known, see TS 29.571 [17]. | C |
| gPSI | GPSI associated with the target UE, when known, see TS 29.571 [17]. | C |
| gUAMI | Previous serving AMF’s GUAMI, when known. See NOTE 1. | C |
| pLMNID | Previous serving PLMN ID. See TS 29.571 [17]. See NOTE 2. | C |
| cancelLocationMethod | Identifies method used to access the serving system, see NOTE 3. | M |
| aMFDeregistrationInfo | Shall include the information sent in the AMF Registration Modification patch record to the UDM (with purgeflag set to true), including cause information. See TS 29.503 [25] clause 6.2.6.2.7. | C |
| deregistrationData | Shall identify the reason for the deregistration included in the deregistration notification received by the UDM. See TS 29.503 [25] clauses 6.2.6.2.5 and 6.2.6.3.3. | C |

NOTE 1: GUAMI is the global unique identifier of an AMF [2] and its format is defined in TS 29.571 [17]. As defined in TS 23.501 [2] clause 5.9.4, GUAMI consists of <MCC> <MNC> <AMF Region ID> <AMF Set ID> <AMF Pointer>. The GUAMI is reported if the UDM receives the same from the AMF.

NOTE 2: PLMN ID provides the vPLMN ID when the target UE is roaming.

NOTE 3: This identifies whether the xIRI containing the UDMCancelLocationMessage record is generated due to the reception of a UDM deregistration, and AMF 3GPP Access deregistration, or an AMF Non 3GPP access deregistration.

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

TS 29.571 [17] requires that the encoding of 3GPP defined identifiers (e.g. IMSI, NAI) shall be prefixed with its corresponding prefix (e.g. with reference to SUPI it requires 'imsi-','nai-'). However, identifiers and parameters shall be coded over the LI\_X2 and LI\_HI2 according to Annex A of the present document, so without the prefix specified in TS 29.571 [17].

END OF FIRST CHANGE

START OF SECOND CHANGE

7.2.2.3.X Start of Interception with UE registered at the UDM

The IRI-POI in the UDM shall generate an xIRI containing the UDMStartOfInterceptionWithRegisteredTarget record when the IRI-POI present in the UDM detects that interception is activated for a UE that has already been registered in the UDM. A UE is considered registered in the UDM when the UDM has a current UE context management entry (see TS 29.503 [25], clauses 5.3.2.2 and 6.2), over at least one access type.

When a target UE is registered on both 3GPP and non-3GPP access, a single UDMStartofInterceptionWithRegisteredTarget record including context information from both accesses shall be generated by the IRI-POI in the UDM.**Table 7.2.2.3.X-1: Payload for UDMStartOfInterceptionWithRegisteredTarget record**

|  |  |  |
| --- | --- | --- |
| **Field name** | **Description** | **M/C/O** |
| uEID | UE Identifier associated with the context entry at the UDM. See TS 29.503 [25] clause 6.2.3.1. | M |
| uDMUEContextInfo | Includes current context information for the target UE stored at the UDM. Encoded according to TS 29.503 [25] clause 6.1.6.2.15 (schema definition reference TS29503\_Nudm\_SDM.yaml). | C |

END OF SECOND CHANGE

START OF THIRD CHANGE

7.2.2.4 Generation of IRI over LI\_HI2

When an xIRI is received over LI\_X2 from the IRI-POI in UDM, the MDF2 shall send an IRI message over LI\_HI2 without undue delay.

The timestamp field of the PSHeader structure shall be set to the time that the UDM event was observed (i.e. the timestamp field of the xIRI).

The IRI type parameter (see ETSI TS 102 232-1 [9] clause 5.2.10) shall be included and coded according to table 7.2.2-4.

**Table 7.2.2-4: IRI type for IRI messages**

|  |  |
| --- | --- |
| **IRI message** | **IRI type** |
| UDMServingSystemMessage | REPORT |
| UDMSubscriberRecordChangeMessage | REPORT |
| UDMCancelLocationMessage | REPORT |
| UDMLocationInformationResult | REPORT |
| UDMUEInformationResponse | REPORT |
| UDMUEAuthenticationResponse | REPORT |
| UDMStartOfInterceptionWithRegisteredTarget | REPORT |

These IRI messages shall omit the CIN (see ETSI TS 102 232-1 [9] clause 5.2.4).

END OF THIRD CHANGE

START OF FOURTH CHANGE

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) version1(1)}

DEFINITIONS IMPLICIT TAGS EXTENSIBILITY IMPLIED ::=

BEGIN

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

-- Relative OIDs

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

tS33128PayloadsOID RELATIVE-OID ::= {threeGPP(4) ts33128(19) r18(18) version1(1)}

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

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

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

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

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

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

-- X2 xIRI payload

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

XIRIPayload ::= SEQUENCE

{

 xIRIPayloadOID [1] RELATIVE-OID,

 event [2] XIRIEvent

}

XIRIEvent ::= CHOICE

{

 -- Access and mobility related events, see clause 6.2.2

 registration [1] AMFRegistration,

 deregistration [2] AMFDeregistration,

 locationUpdate [3] AMFLocationUpdate,

 startOfInterceptionWithRegisteredUE [4] AMFStartOfInterceptionWithRegisteredUE,

 unsuccessfulAMProcedure [5] AMFUnsuccessfulProcedure,

 -- PDU session-related events, see clause 6.2.3

 pDUSessionEstablishment [6] SMFPDUSessionEstablishment,

 pDUSessionModification [7] SMFPDUSessionModification,

 pDUSessionRelease [8] SMFPDUSessionRelease,

 startOfInterceptionWithEstablishedPDUSession [9] SMFStartOfInterceptionWithEstablishedPDUSession,

 unsuccessfulSMProcedure [10] SMFUnsuccessfulProcedure,

 -- Subscriber-management related events, see clause 7.2.2

 servingSystemMessage [11] UDMServingSystemMessage,

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

 sMSMessage [12] SMSMessage,

 -- LALS-related events, see clause 7.3.1

 lALSReport [13] LALSReport,

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

 pDHeaderReport [14] PDHeaderReport,

 pDSummaryReport [15] PDSummaryReport,

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

 -- MMS-related events, see clause 7.4.2

 mMSSend [17] MMSSend,

 mMSSendByNonLocalTarget [18] MMSSendByNonLocalTarget,

 mMSNotification [19] MMSNotification,

 mMSSendToNonLocalTarget [20] MMSSendToNonLocalTarget,

 mMSNotificationResponse [21] MMSNotificationResponse,

 mMSRetrieval [22] MMSRetrieval,

 mMSDeliveryAck [23] MMSDeliveryAck,

 mMSForward [24] MMSForward,

 mMSDeleteFromRelay [25] MMSDeleteFromRelay,

 mMSDeliveryReport [26] MMSDeliveryReport,

 mMSDeliveryReportNonLocalTarget [27] MMSDeliveryReportNonLocalTarget,

 mMSReadReport [28] MMSReadReport,

 mMSReadReportNonLocalTarget [29] MMSReadReportNonLocalTarget,

 mMSCancel [30] MMSCancel,

 mMSMBoxStore [31] MMSMBoxStore,

 mMSMBoxUpload [32] MMSMBoxUpload,

 mMSMBoxDelete [33] MMSMBoxDelete,

 mMSMBoxViewRequest [34] MMSMBoxViewRequest,

 mMSMBoxViewResponse [35] MMSMBoxViewResponse,

 -- PTC-related events, see clause 7.5.2

 pTCRegistration [36] PTCRegistration,

 pTCSessionInitiation [37] PTCSessionInitiation,

 pTCSessionAbandon [38] PTCSessionAbandon,

 pTCSessionStart [39] PTCSessionStart,

 pTCSessionEnd [40] PTCSessionEnd,

 pTCStartOfInterception [41] PTCStartOfInterception,

 pTCPreEstablishedSession [42] PTCPreEstablishedSession,

 pTCInstantPersonalAlert [43] PTCInstantPersonalAlert,

 pTCPartyJoin [44] PTCPartyJoin,

 pTCPartyDrop [45] PTCPartyDrop,

 pTCPartyHold [46] PTCPartyHold,

 pTCMediaModification [47] PTCMediaModification,

 pTCGroupAdvertisement [48] PTCGroupAdvertisement,

 pTCFloorControl [49] PTCFloorControl,

 pTCTargetPresence [50] PTCTargetPresence,

 pTCParticipantPresence [51] PTCParticipantPresence,

 pTCListManagement [52] PTCListManagement,

 pTCAccessPolicy [53] PTCAccessPolicy,

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

 subscriberRecordChangeMessage [54] UDMSubscriberRecordChangeMessage,

 cancelLocationMessage [55] UDMCancelLocationMessage,

 -- SMS-related events continued from choice 12

 sMSReport [56] SMSReport,

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

 sMFMAPDUSessionEstablishment [57] SMFMAPDUSessionEstablishment,

 sMFMAPDUSessionModification [58] SMFMAPDUSessionModification,

 sMFMAPDUSessionRelease [59] SMFMAPDUSessionRelease,

 startOfInterceptionWithEstablishedMAPDUSession [60] SMFStartOfInterceptionWithEstablishedMAPDUSession,

 unsuccessfulMASMProcedure [61] SMFMAUnsuccessfulProcedure,

 -- Identifier Association events, see clauses 6.2.2.2.7 and 6.3.2.2.2

 aMFIdentifierAssociation [62] AMFIdentifierAssociation,

 mMEIdentifierAssociation [63] MMEIdentifierAssociation,

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

 sMFPDUtoMAPDUSessionModification [64] SMFPDUtoMAPDUSessionModification,

 -- NEF services related events, see clause 7.7.2

 nEFPDUSessionEstablishment [65] NEFPDUSessionEstablishment,

 nEFPDUSessionModification [66] NEFPDUSessionModification,

 nEFPDUSessionRelease [67] NEFPDUSessionRelease,

 nEFUnsuccessfulProcedure [68] NEFUnsuccessfulProcedure,

 nEFStartOfInterceptionWithEstablishedPDUSession [69] NEFStartOfInterceptionWithEstablishedPDUSession,

 nEFdeviceTrigger [70] NEFDeviceTrigger,

 nEFdeviceTriggerReplace [71] NEFDeviceTriggerReplace,

 nEFdeviceTriggerCancellation [72] NEFDeviceTriggerCancellation,

 nEFdeviceTriggerReportNotify [73] NEFDeviceTriggerReportNotify,

 nEFMSISDNLessMOSMS [74] NEFMSISDNLessMOSMS,

 nEFExpectedUEBehaviourUpdate [75] NEFExpectedUEBehaviourUpdate,

 -- SCEF services related events, see clause 7.8.2

 sCEFPDNConnectionEstablishment [76] SCEFPDNConnectionEstablishment,

 sCEFPDNConnectionUpdate [77] SCEFPDNConnectionUpdate,

 sCEFPDNConnectionRelease [78] SCEFPDNConnectionRelease,

 sCEFUnsuccessfulProcedure [79] SCEFUnsuccessfulProcedure,

 sCEFStartOfInterceptionWithEstablishedPDNConnection [80] SCEFStartOfInterceptionWithEstablishedPDNConnection,

 sCEFdeviceTrigger [81] SCEFDeviceTrigger,

 sCEFdeviceTriggerReplace [82] SCEFDeviceTriggerReplace,

 sCEFdeviceTriggerCancellation [83] SCEFDeviceTriggerCancellation,

 sCEFdeviceTriggerReportNotify [84] SCEFDeviceTriggerReportNotify,

 sCEFMSISDNLessMOSMS [85] SCEFMSISDNLessMOSMS,

 sCEFCommunicationPatternUpdate [86] SCEFCommunicationPatternUpdate,

 -- EPS Events, see clause 6.3

 -- MME Events, see clause 6.3.2.2

 mMEAttach [87] MMEAttach,

 mMEDetach [88] MMEDetach,

 mMELocationUpdate [89] MMELocationUpdate,

 mMEStartOfInterceptionWithEPSAttachedUE [90] MMEStartOfInterceptionWithEPSAttachedUE,

 mMEUnsuccessfulProcedure [91] MMEUnsuccessfulProcedure,

 -- AKMA key management events, see clause 7.9.1

 aAnFAnchorKeyRegister [92] AAnFAnchorKeyRegister,

 aAnFKAKMAApplicationKeyGet [93] AAnFKAKMAApplicationKeyGet,

 aAnFStartOfInterceptWithEstablishedAKMAKeyMaterial [94] AAnFStartOfInterceptWithEstablishedAKMAKeyMaterial,

 aAnFAKMAContextRemovalRecord [95] AAnFAKMAContextRemovalRecord,

 aFAKMAApplicationKeyRefresh [96] AFAKMAApplicationKeyRefresh,

 aFStartOfInterceptWithEstablishedAKMAApplicationKey [97] AFStartOfInterceptWithEstablishedAKMAApplicationKey,

 aFAuxiliarySecurityParameterEstablishment [98] AFAuxiliarySecurityParameterEstablishment,

 aFApplicationKeyRemoval [99] AFApplicationKeyRemoval,

 -- HR LI Events, see clause 7.10.3.3

 n9HRPDUSessionInfo [100] N9HRPDUSessionInfo,

 s8HRBearerInfo [101] S8HRBearerInfo,

 -- Separated Location Reporting, see clause 7.3.4

 separatedLocationReporting [102] SeparatedLocationReporting,

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

 sTIRSHAKENSignatureGeneration [103] STIRSHAKENSignatureGeneration,

 sTIRSHAKENSignatureValidation [104] STIRSHAKENSignatureValidation,

 -- IMS events, see clause 7.12.4.2

 iMSMessage [105] IMSMessage,

 startOfInterceptionForActiveIMSSession [106] StartOfInterceptionForActiveIMSSession,

 iMSCCUnavailable [107] IMSCCUnavailable,

 -- UDM events, see clause 7.2.2

 uDMLocationInformationResult [108] UDMLocationInformationResult,

 uDMUEInformationResponse [109] UDMUEInformationResponse,

 uDMUEAuthenticationResponse [110] UDMUEAuthenticationResponse,

 -- AMF events, see 6.2.2.2.8

 positioningInfoTransfer [111] AMFPositioningInfoTransfer,

 -- MME Events, see clause 6.3.2.2.8

 mMEPositioningInfoTransfer [112] MMEPositioningInfoTransfer,

 -- AMF events, see 6.2.2.2.9 continued from choice 5

 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 [901] UDMStartOfInterceptionWithRegisteredTarget

}

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

-- X3 xCC payload

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

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

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

-- HI2 IRI payload

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

IRIPayload ::= SEQUENCE

{

 iRIPayloadOID [1] RELATIVE-OID,

 event [2] IRIEvent,

 targetIdentifiers [3] SEQUENCE OF IRITargetIdentifier OPTIONAL

}

IRIEvent ::= CHOICE

{

 -- Registration-related events, see clause 6.2.2

 registration [1] AMFRegistration,

 deregistration [2] AMFDeregistration,

 locationUpdate [3] AMFLocationUpdate,

 startOfInterceptionWithRegisteredUE [4] AMFStartOfInterceptionWithRegisteredUE,

 unsuccessfulRegistrationProcedure [5] AMFUnsuccessfulProcedure,

 -- PDU session-related events, see clause 6.2.3

 pDUSessionEstablishment [6] SMFPDUSessionEstablishment,

 pDUSessionModification [7] SMFPDUSessionModification,

 pDUSessionRelease [8] SMFPDUSessionRelease,

 startOfInterceptionWithEstablishedPDUSession [9] SMFStartOfInterceptionWithEstablishedPDUSession,

 unsuccessfulSessionProcedure [10] SMFUnsuccessfulProcedure,

 -- Subscriber-management related events, see clause 7.2.2

 servingSystemMessage [11] UDMServingSystemMessage,

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

 sMSMessage [12] SMSMessage,

 -- LALS-related events, see clause 7.3.1

 lALSReport [13] LALSReport,

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

 pDHeaderReport [14] PDHeaderReport,

 pDSummaryReport [15] PDSummaryReport,

 -- MDF-related events, see clause 7.3.2

 mDFCellSiteReport [16] MDFCellSiteReport,

 -- MMS-related events, see clause 7.4.2

 mMSSend [17] MMSSend,

 mMSSendByNonLocalTarget [18] MMSSendByNonLocalTarget,

 mMSNotification [19] MMSNotification,

 mMSSendToNonLocalTarget [20] MMSSendToNonLocalTarget,

 mMSNotificationResponse [21] MMSNotificationResponse,

 mMSRetrieval [22] MMSRetrieval,

 mMSDeliveryAck [23] MMSDeliveryAck,

 mMSForward [24] MMSForward,

 mMSDeleteFromRelay [25] MMSDeleteFromRelay,

 mMSDeliveryReport [26] MMSDeliveryReport,

 mMSDeliveryReportNonLocalTarget [27] MMSDeliveryReportNonLocalTarget,

 mMSReadReport [28] MMSReadReport,

 mMSReadReportNonLocalTarget [29] MMSReadReportNonLocalTarget,

 mMSCancel [30] MMSCancel,

 mMSMBoxStore [31] MMSMBoxStore,

 mMSMBoxUpload [32] MMSMBoxUpload,

 mMSMBoxDelete [33] MMSMBoxDelete,

 mMSMBoxViewRequest [34] MMSMBoxViewRequest,

 mMSMBoxViewResponse [35] MMSMBoxViewResponse,

 -- PTC-related events, see clause 7.5.2

 pTCRegistration [36] PTCRegistration,

 pTCSessionInitiation [37] PTCSessionInitiation,

 pTCSessionAbandon [38] PTCSessionAbandon,

 pTCSessionStart [39] PTCSessionStart,

 pTCSessionEnd [40] PTCSessionEnd,

 pTCStartOfInterception [41] PTCStartOfInterception,

 pTCPreEstablishedSession [42] PTCPreEstablishedSession,

 pTCInstantPersonalAlert [43] PTCInstantPersonalAlert,

 pTCPartyJoin [44] PTCPartyJoin,

 pTCPartyDrop [45] PTCPartyDrop,

 pTCPartyHold [46] PTCPartyHold,

 pTCMediaModification [47] PTCMediaModification,

 pTCGroupAdvertisement [48] PTCGroupAdvertisement,

 pTCFloorControl [49] PTCFloorControl,

 pTCTargetPresence [50] PTCTargetPresence,

 pTCParticipantPresence [51] PTCParticipantPresence,

 pTCListManagement [52] PTCListManagement,

 pTCAccessPolicy [53] PTCAccessPolicy,

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

 subscriberRecordChangeMessage [54] UDMSubscriberRecordChangeMessage,

 cancelLocationMessage [55] UDMCancelLocationMessage,

 -- SMS-related events, continued from choice 12

 sMSReport [56] SMSReport,

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

 sMFMAPDUSessionEstablishment [57] SMFMAPDUSessionEstablishment,

 sMFMAPDUSessionModification [58] SMFMAPDUSessionModification,

 sMFMAPDUSessionRelease [59] SMFMAPDUSessionRelease,

 startOfInterceptionWithEstablishedMAPDUSession [60] SMFStartOfInterceptionWithEstablishedMAPDUSession,

 unsuccessfulMASMProcedure [61] SMFMAUnsuccessfulProcedure,

 -- Identifier Association events, see clauses 6.2.2.2.7 and 6.3.2.2.2

 aMFIdentifierAssociation [62] AMFIdentifierAssociation,

 mMEIdentifierAssociation [63] MMEIdentifierAssociation,

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

 sMFPDUtoMAPDUSessionModification [64] SMFPDUtoMAPDUSessionModification,

 -- NEF services related events, see clause 7.7.2,

 nEFPDUSessionEstablishment [65] NEFPDUSessionEstablishment,

 nEFPDUSessionModification [66] NEFPDUSessionModification,

 nEFPDUSessionRelease [67] NEFPDUSessionRelease,

 nEFUnsuccessfulProcedure [68] NEFUnsuccessfulProcedure,

 nEFStartOfInterceptionWithEstablishedPDUSession [69] NEFStartOfInterceptionWithEstablishedPDUSession,

 nEFdeviceTrigger [70] NEFDeviceTrigger,

 nEFdeviceTriggerReplace [71] NEFDeviceTriggerReplace,

 nEFdeviceTriggerCancellation [72] NEFDeviceTriggerCancellation,

 nEFdeviceTriggerReportNotify [73] NEFDeviceTriggerReportNotify,

 nEFMSISDNLessMOSMS [74] NEFMSISDNLessMOSMS,

 nEFExpectedUEBehaviourUpdate [75] NEFExpectedUEBehaviourUpdate,

 -- SCEF services related events, see clause 7.8.2

 sCEFPDNConnectionEstablishment [76] SCEFPDNConnectionEstablishment,

 sCEFPDNConnectionUpdate [77] SCEFPDNConnectionUpdate,

 sCEFPDNConnectionRelease [78] SCEFPDNConnectionRelease,

 sCEFUnsuccessfulProcedure [79] SCEFUnsuccessfulProcedure,

 sCEFStartOfInterceptionWithEstablishedPDNConnection [80] SCEFStartOfInterceptionWithEstablishedPDNConnection,

 sCEFdeviceTrigger [81] SCEFDeviceTrigger,

 sCEFdeviceTriggerReplace [82] SCEFDeviceTriggerReplace,

 sCEFdeviceTriggerCancellation [83] SCEFDeviceTriggerCancellation,

 sCEFdeviceTriggerReportNotify [84] SCEFDeviceTriggerReportNotify,

 sCEFMSISDNLessMOSMS [85] SCEFMSISDNLessMOSMS,

 sCEFCommunicationPatternUpdate [86] SCEFCommunicationPatternUpdate,

 -- EPS Events, see clause 6.3

 -- MME Events, see clause 6.3.2.2

 mMEAttach [87] MMEAttach,

 mMEDetach [88] MMEDetach,

 mMELocationUpdate [89] MMELocationUpdate,

 mMEStartOfInterceptionWithEPSAttachedUE [90] MMEStartOfInterceptionWithEPSAttachedUE,

 mMEUnsuccessfulProcedure [91] MMEUnsuccessfulProcedure,

 -- AKMA key management events, see clause 7.9.1

 aAnFAnchorKeyRegister [92] AAnFAnchorKeyRegister,

 aAnFKAKMAApplicationKeyGet [93] AAnFKAKMAApplicationKeyGet,

 aAnFStartOfInterceptWithEstablishedAKMAKeyMaterial [94] AAnFStartOfInterceptWithEstablishedAKMAKeyMaterial,

 aAnFAKMAContextRemovalRecord [95] AAnFAKMAContextRemovalRecord,

 aFAKMAApplicationKeyRefresh [96] AFAKMAApplicationKeyRefresh,

 aFStartOfInterceptWithEstablishedAKMAApplicationKey [97] AFStartOfInterceptWithEstablishedAKMAApplicationKey,

 aFAuxiliarySecurityParameterEstablishment [98] AFAuxiliarySecurityParameterEstablishment,

 aFApplicationKeyRemoval [99] AFApplicationKeyRemoval,

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

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

 -- Separated Location Reporting, see clause 7.3.4

 separatedLocationReporting [102] SeparatedLocationReporting,

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

 sTIRSHAKENSignatureGeneration [103] STIRSHAKENSignatureGeneration,

 sTIRSHAKENSignatureValidation [104] STIRSHAKENSignatureValidation,

 -- IMS events, see clause 7.11.4.2

 iMSMessage [105] IMSMessage,

 startOfInterceptionForActiveIMSSession [106] StartOfInterceptionForActiveIMSSession,

 iMSCCUnavailable [107] IMSCCUnavailable,

 -- UDM events, see clause 7.2.2

 uDMLocationInformationResultRecord [108] UDMLocationInformationResult,

 uDMUEInformationResponse [109] UDMUEInformationResponse,

 uDMUEAuthenticationResponse [110] UDMUEAuthenticationResponse,

 -- AMF events, see 6.2.2.2.8

 positioningInfoTransfer [111] AMFPositioningInfoTransfer,

 -- MME Events, see clause 6.3.2.2.8

 mMEPositioningInfoTransfer [112] MMEPositioningInfoTransfer,

 -- AMF events, see 6.2.2.2.9 continued from choice 5

 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 7.2.2.4, continued from tag 110

 uDMStartOfInterceptionWithRegisteredTarget [901] UDMStartOfInterceptionWithRegisteredTarget

}

IRITargetIdentifier ::= SEQUENCE

{

 identifier [1] TargetIdentifier,

 provenance [2] TargetIdentifierProvenance OPTIONAL

}

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

-- HI3 CC payload

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

CCPayload ::= SEQUENCE

{

 cCPayloadOID [1] RELATIVE-OID,

 pDU [2] CCPDU

}

CCPDU ::= CHOICE

{

 uPFCCPDU [1] UPFCCPDU,

 extendedUPFCCPDU [2] ExtendedUPFCCPDU,

 mMSCCPDU [3] MMSCCPDU,

 nIDDCCPDU [4] NIDDCCPDU,

 pTCCCPDU [5] PTCCCPDU,

 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

}

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

-- 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)

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

-- 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

}

-- 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

}

-- 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

}

-- 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

}

-- 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

}

-- 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,

 deregistrationData [8] UDMDeregistrationData

}

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

{

 uEID [1] SUPI,

 uDMUEContextInfo [2] 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,

 pei [3] PEI

}

UDMDeregistrationData ::= SEQUENCE

{

 deregReason [1] UDMDeregReason,

 accessType [2] AccessType,

 pDUSessionID [3] PDUSessionID

}

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

}

-- See clause 7.12.4.2.2 for details of this structure

StartOfInterceptionForActiveIMSSession ::= SEQUENCE

{

 originatingId [1] SEQUENCE OF IMPU,

 terminatingId [2] IMPU,

 sDPState [3] SEQUENCE OF OCTET STRING OPTIONAL,

 diversionIdentity [4] IMPU OPTIONAL,

 voIPRoamingIndication [5] VoIPRoamingIndication OPTIONAL,

 location [7] Location OPTIONAL

}

-- See clause 7.12.4.2.3 for the details.

IMSCCUnavailable ::= SEQUENCE

{

 cCUnavailableReason [1] UTF8String,

 sDPState [2] OCTET STRING OPTIONAL

}

-- =========

-- IMS 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

}

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

-- 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

}

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

-- 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

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

}

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

-- 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)

END

END OF FOURTH CHANGE

END OF ALL CHANGES