**3GPP TSG-SA3 Meeting #81-LI-e-a *s3i210221***

**Online,** **12th Apr 2021 - 16th Apr 2021**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **33.128** | **CR** | **0173** | **rev** | **1** | **Current version:** | **17.0.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
|  | | | | | | | | |

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

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** |  | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | SA3LI (Ministère Economie et Finances) | | | | | | | | | |
| ***Source to TSG:*** | SA3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | LI17 | | | | |  | ***Date:*** | | | 2021-04-15 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | NEF services in 5GS cannot be intercepted | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Adds stage 3 for NEF services in 5GS | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | NEF services in 5GS solution would continue to be missing | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.2.X (New) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS 33.127 ... CR 0117 | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | | Linked to CR s3i210220 and indirectly CR s3i21218 | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | s3i210221 | | | | | | | | |

First change

2 References

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

[20] OMA-TS-MLP-V3\_5-20181211-C: "Open Mobile Alliance; Mobile Location Protocol, Candidate Version 3.5", "https://www.openmobilealliance.org/release/MLS/V1\_4-20181211-C/OMA-TS-MLP-V3\_5-20181211-C.pdf".

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Second change

6.2.X. LI at NEF

6.2.X.1. Provisioning over LI\_X1

6.2.X.2. LI for NIDD using NEF

6.2.X.3. LI for Device triggering

The IRI-POI present in the NEF shall send the xIRIs over LI\_X2 for each of the events listed in corresponding in TS 33.127 [5] clause 6.2.X.2, the details of which are described in the following sub-clauses.

6.2.X.3.1. Device trigger

The IRI-POI in the NEF shall generate an xIRI containing a NEFDeviceTrigger record when the IRI-POI present in the NEF detects that an AF has sent a Device trigger to a target UE matching one of the target identifiers.

Accordingly, the IRI-POI in the NEF generates the xIRI when the following events are detected:

- NEF receives a Nnef\_Trigger\_Delivery Request from an AF as defined in TS 23.502 [4]. The message identifies the source port on the AF representing the application in the AF sending the message and the destination port on the target UE representing the triggering application in that UE. (see TS 23.502 [4], TS 29.522 [XX] and TS 29.122[XY]). The NEF queries the UDM to translate the GPSI of the UE into SUPI.

**Table 6.2.X-1: NEFDeviceTrigger Record**

|  |  |  |
| --- | --- | --- |
| **Field name** | **Description** | **M/C/O** |
| sUPI | SUPI associated with the UE | M |
| gPSI | GPSI used with the UE | M |
| triggerId | Identity of the Device trigger that should be provided in the deviceTriggeringDeliveryReportNotification IRI, Device trigger replacement IRI and Device trigger cancellation IRI | M |
| aFID | The AF sending the Device trigger | M |
| triggerPayload | The Device triggering payload | C |
| validityPeriod | The validity time in seconds for the specific action requested | C |
| priority | The priority of the Device trigger | C |
| sourcePortId | Application identity on the AF which delivers the Device trigger | C |
| destinationPortId | Used to uniquely identify the triggering application addressed in the device. | C |

6.2.X.3.2. Device trigger replacement

The IRI-POI in the NEF shall generate an xIRI containing a NEFDeviceTriggerReplace record when the IRI-POI present in the NEF detects that an AF has sent a Device trigger replacement for a previously sent Device trigger to a UE matching one of the target identifiers provided via LI\_X1 to the IRI POI in the NEF. It replaces a previously submitted Device trigger message which has not yet been delivered to the UE.

Accordingly, the IRI-POI in the NEF generates the xIRI when the following event is detected:

- NEF receives a Nnef\_Trigger\_Delivery Request (for a device trigger replacement) from an AF TS 23.502 [4] TS 29.122 [XY].

**Table 6.2.X-2: NEFDeviceTriggerReplace Record**

|  |  |  |
| --- | --- | --- |
| **Field name** | **Description** | **M/C/O** |
| sUPI | SUPI associated with the target UE | M |
| gPSI | GPSI used with the taget UE | M |
| triggerId | Identity of the corresponding Device trigger to be replaced | M |
| aFID | The AF replacing an existing Device trigger which has not been delivered yet to the device (e.g., because the device is unreachable) by a new Device trigger | M |
| triggerPayload | The device triggering payload | C |
| validityPeriod | The validity time in seconds for the specific action requested | C |
| priorityDT | The priority of the device trigger | C |
| sourcePortId | Port on the AF which delivers the device trigger | C |
| destinationPortId | Port on the device which is the recipient of the device trigger | C |

6.2.X.3.3. Device trigger cancellation

The IRI-POI in the NEF shall generate an xIRI containing a NEFDeviceTriggerCancellation record when the IRI-POI present in the NEF detects that an AF has sent a Device trigger cancellation for a previously sent Device trigger to a UE matching one of the target identifiers provided via LI\_X1 to the IRI-POI in the NEF. It cancels previously submitted Device trigger message which has not yet been delivered to the target UE.

Accordingly, the IRI-POI in the NEF generates the xIRI when the following event is detected:

- NEF receives a Nnef\_Trigger\_Delivery Request (for a device trigger cancellation).

**Table 6.2.X-3: NEFDeviceTriggerCancellation Record**

|  |  |  |
| --- | --- | --- |
| **Field name** | **Description** | **M/C/O** |
| sUPI | SUPI associated with the target UE | M |
| gPSI | GPSI used with the target UE | M |
| triggerId | Identity of the corresponding device trigger to be cancelled | M |

6.2.X.3.4. Device trigger report notification

The IRI-POI in the NEF shall generate an xIRI containing a NEFDeviceTriggerReportNotify record when the IRI-POI present in the NEF detects that the NEF has returned a Device trigger report to the AF with a cause value indicating the trigger delivery outcome (e.g., succeeded, unknown or failed).

Accordingly, the IRI-POI in the NEF generates the xIRI when the following event is detected:

- NEF sends a Nnef\_Trigger\_DeliveryNotify service operation to inform the AF on the delivery outcome of the device trigger (see TS 23.502 [4] TS 29.522 [XX] TS 29.122 [XY]).

**Table 6.2.X-4: NEFDeviceTriggerReportNotify Record**

|  |  |  |
| --- | --- | --- |
| **Field name** | **Description** | **M/C/O** |
| sUPI | SUPI associated with the target UE | M |
| gPSI | GPSI used with the target UE | M |
| triggerId | Identity of the corresponding Device trigger | M |
| deviceTriggerDeliveryResult | Delivery result represents the result of the delivery of a device triggering request:   * SUCCESS: The value indicates that the device action request was successfully completed. * UNKNOWN: The value indicates any unspecified errors. * FAILURE: The value indicates that this trigger encountered a delivery error and is deemed permanently undeliverable. * TRIGGERED: The value indicates that Device triggering request is accepted by the NEF. * EXPIRED: The value indicates that the validity period expired before the trigger could be delivered. * UNCONFIRMED: The value indicates that the delivery of the device action request is not confirmed. * REPLACED: The value indicates that the device triggering replacement request is accepted by the SCEF. * TERMINATE: The NEF includes this value in the response for a successful device triggering cancellation request. The value indicates that the delivery of the device action request is terminated by the AF. | M |

6.2.X.4. LI for MSISDN-less MO SMS

The IRI-POI present in the NEF shall send the xIRIs over LI\_X2 for each of the events listed in TS 33.127 [5] clause 6.2.X.3, the details of which are described in the following sub-clauses.

6.2.X.4.1. MSISDN-less MO SMS

The IRI-POI in the NEF shall generate an xIRI containing a NEFMSISDNLessMOSMS record when the IRI-POI present in the NEF detects that a target UE has sent a MSISDN-less MO SMS to an AF.

Accordingly, the IRI-POI in the NEF generates the xIRI when the following event is detected:

* NEF receives the SMS from an SMSC and forwards it to the AF via the Nnef\_MSISDN-less\_MO\_SMSNotify service operation [4].

**Table 6.2.X-5: NEFMSISDNLessMOSMS Record**

|  |  |  |
| --- | --- | --- |
| **Field name** | **Description** | **M/C/O** |
| sUPI | SUPI associated with the target UE | M |
| gPSI | GPSI in the form of an external identifier as username@realm and corresponding to the identity of the originating SMS party | M |
| terminatingSMSParty | Identity of the AF receiving the SMS | M |
| sMS | SMS TPDU | C |
| sourcePort | port identifying the application of the target UE sending the MSISN-less MO SMS | C |
| destinationPort | port identifying the application of the AF which is the recipient of the MSISN-less MO SMS | C |

6.2.X.5. LI for Parameter Provisioning

The IRI-POI present in the NEF shall send the xIRIs over LI\_X2 for each of the events listed in corresponding in TS 33.127 [5] clause 6.2.X.4, the details of which are described in the following sub-clauses.

6.2.X.5.1. Expected UE behavior update

The IRI-POI in the NEF shall generate an xIRI containing an NEFExpectedUEBehaviorUpdate record when the IRI-POI present in the NEF detects that an AF has updated the UE Expected behavior data.

Accordingly, the IRI-POI in the NEF generates the xIRI when the following event is detected:

* NEF receives a NEF\_ParameterProvision\_Create Request or NEF\_ParameterProvision\_Update Request from an AF related to the target UE [4],
* NEF receives a NEF\_ParameterProvision\_Delete Request from an AF to delete the existing UE Expected Behaviour parameters related to the target UE [4],
* NEF returns a NEF\_ParameterProvision\_Get Response containing the UE Expected Behavior of the target UE to the querying AF [4].

**Table 6.2.X-6: NEFExpectedUEBehaviorUpdate Record**

|  |  |  |
| --- | --- | --- |
| **Field name** | **Description** | **M/C/O** |
| gPSI | GPSI of the target UE to which the expected UE behavior applies | M |
| expectedUEMoving Trajectory | Identifies the UE's expected geographical movement | O |
| stationaryIndication | Identifies whether the UE is stationary or mobile | O |
| communicationDuration  Time | Indicates for how long the UE will normally stay in CM-Connected for data transmission expressed in seconds | O |
| periodicTime | Interval Time of periodic communication in seconds | O |
| scheduledCommunication  Time | Time and day of the week when the UE is available for communication, as defined in TS 29.571. | O |
| batteryIndication | Identifies power consumption criticality for the UE: if the  UE is battery powered but the battery is not rechargeable/not  replaceable, battery powered with  rechargeable/replaceable battery, or not battery powered. | O |
| trafficProfile | Identifies the type of data transmission: single packet transmission (UL or DL), dual packet transmission (UL with subsequent DL or DL with subsequent UL), multiple packets transmission | O |
| scheduledCommunicationType | Indicates that the Scheduled Communication Type is Downlink only or Uplink only or Bi-directional | O |
| expectedTimeAndDayOf WeekInTrajectory | Identifies the time and day of week when the UE is expected to be at each location included in the Expected UE Moving Trajectory | O |
| aFID | AF identity requesting expected UE behavior update | M |
| validityTime | Identifies when the expected UE behavior parameter set expires and shall be deleted. If absent, it indicates that there is no expiration time for this parameter set | O |

Third change

Annex A (normative):  
Structure of both the Internal and External Interfaces

TS33128Payloads

{itu-t(0) identified-organization(4) etsi(0) securityDomain(2) lawfulIntercept(2) threeGPP(4) ts33128(19) r17(17) version0(0)}

DEFINITIONS IMPLICIT TAGS EXTENSIBILITY IMPLIED ::=

BEGIN

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

-- Relative OIDs

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

tS33128PayloadsOID RELATIVE-OID ::= {threeGPP(4) ts33128(19) r17(17) version0(0)}

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

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

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

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

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

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

-- X2 xIRI payload

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

XIRIPayload ::= SEQUENCE

{

xIRIPayloadOID [1] RELATIVE-OID,

event [2] XIRIEvent

}

XIRIEvent ::= CHOICE

{

-- Access and mobility related events, see clause 6.2.2

registration [1] AMFRegistration,

deregistration [2] AMFDeregistration,

locationUpdate [3] AMFLocationUpdate,

startOfInterceptionWithRegisteredUE [4] AMFStartOfInterceptionWithRegisteredUE,

unsuccessfulAMProcedure [5] AMFUnsuccessfulProcedure,

-- PDU session-related events, see clause 6.2.3

pDUSessionEstablishment [6] SMFPDUSessionEstablishment,

pDUSessionModification [7] SMFPDUSessionModification,

pDUSessionRelease [8] SMFPDUSessionRelease,

startOfInterceptionWithEstablishedPDUSession [9] SMFStartOfInterceptionWithEstablishedPDUSession,

unsuccessfulSMProcedure [10] SMFUnsuccessfulProcedure,

-- Subscriber-management related events, see clause 7.2.2

servingSystemMessage [11] UDMServingSystemMessage,

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

sMSMessage [12] SMSMessage,

-- LALS-related events, see clause 7.3.3

lALSReport [13] LALSReport,

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

pDHeaderReport [14] PDHeaderReport,

pDSummaryReport [15] PDSummaryReport,

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

-- MMS-related events, see clause 7.4.2

mMSSend [17] MMSSend,

mMSSendByNonLocalTarget [18] MMSSendByNonLocalTarget,

mMSNotification [19] MMSNotification,

mMSSendToNonLocalTarget [20] MMSSendToNonLocalTarget,

mMSNotificationResponse [21] MMSNotificationResponse,

mMSRetrieval [22] MMSRetrieval,

mMSDeliveryAck [23] MMSDeliveryAck,

mMSForward [24] MMSForward,

mMSDeleteFromRelay [25] MMSDeleteFromRelay,

mMSDeliveryReport [26] MMSDeliveryReport,

mMSDeliveryReportNonLocalTarget [27] MMSDeliveryReportNonLocalTarget,

mMSReadReport [28] MMSReadReport,

mMSReadReportNonLocalTarget [29] MMSReadReportNonLocalTarget,

mMSCancel [30] MMSCancel,

mMSMBoxStore [31] MMSMBoxStore,

mMSMBoxUpload [32] MMSMBoxUpload,

mMSMBoxDelete [33] MMSMBoxDelete,

mMSMBoxViewRequest [34] MMSMBoxViewRequest,

mMSMBoxViewResponse [35] MMSMBoxViewResponse,

-- PTC-related events, see clause 7.5.2

pTCRegistration [36] PTCRegistration,

pTCSessionInitiation [37] PTCSessionInitiation,

pTCSessionAbandon [38] PTCSessionAbandon,

pTCSessionStart [39] PTCSessionStart,

pTCSessionEnd [40] PTCSessionEnd,

pTCStartOfInterception [41] PTCStartOfInterception,

pTCPreEstablishedSession [42] PTCPreEstablishedSession,

pTCInstantPersonalAlert [43] PTCInstantPersonalAlert,

pTCPartyJoin [44] PTCPartyJoin,

pTCPartyDrop [45] PTCPartyDrop,

pTCPartyHold [46] PTCPartyHold,

pTCMediaModification [47] PTCMediaModification,

pTCGroupAdvertisement [48] PTCGroupAdvertisement,

pTCFloorControl [49] PTCFloorControl,

pTCTargetPresence [50] PTCTargetPresence,

pTCParticipantPresence [51] PTCParticipantPresence,

pTCListManagement [52] PTCListManagement,

pTCAccessPolicy [53] PTCAccessPolicy,

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

subscriberRecordChangeMessage [54] UDMSubscriberRecordChangeMessage,

cancelLocationMessage [55] UDMCancelLocationMessage,

-- SMS-related events continued from choice 12

sMSReport [56] SMSReport,

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

sMFMAPDUSessionEstablishment [57] SMFMAPDUSessionEstablishment,

sMFMAPDUSessionModification [58] SMFMAPDUSessionModification,

sMFMAPDUSessionRelease [59] SMFMAPDUSessionRelease,

startOfInterceptionWithEstablishedMAPDUSession [60] SMFStartOfInterceptionWithEstablishedMAPDUSession,

unsuccessfulMASMProcedure [61] SMFMAUnsuccessfulProcedure,

-- Identifier Association events, see clauses 6.2.2.2.7 and 6.3.2.2.2

aMFIdentifierAssocation [62] AMFIdentifierAssocation,

mMEIdentifierAssocation [63] MMEIdentifierAssocation,

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

sMFPDUtoMAPDUSessionModification [64] SMFPDUtoMAPDUSessionModification,

-- NEF services related events, see clause 6.2.X

nEFdeviceTrigger [65] NEFDeviceTrigger,

nEFdeviceTriggerReplace [66] NEFDeviceTriggerReplace,

nEFdeviceTriggerCancellation [67] NEFDeviceTriggerCancellation,

nEFdeviceTriggerReportNotify [68] NEFDeviceTriggerReportNotify,

nEFMSISDNLessMOSMS [69] NEFMSISDNLessMOSMS,

nEFExpectedUEBehaviour Update [70] NEFExpectedUEBehaviourUpdate

}

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

-- X3 xCC payload

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

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

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

-- HI2 IRI payload

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

IRIPayload ::= SEQUENCE

{

iRIPayloadOID [1] RELATIVE-OID,

event [2] IRIEvent,

targetIdentifiers [3] SEQUENCE OF IRITargetIdentifier OPTIONAL

}

IRIEvent ::= CHOICE

{

-- Registration-related events, see clause 6.2.2

registration [1] AMFRegistration,

deregistration [2] AMFDeregistration,

locationUpdate [3] AMFLocationUpdate,

startOfInterceptionWithRegisteredUE [4] AMFStartOfInterceptionWithRegisteredUE,

unsuccessfulRegistrationProcedure [5] AMFUnsuccessfulProcedure,

-- PDU session-related events, see clause 6.2.3

pDUSessionEstablishment [6] SMFPDUSessionEstablishment,

pDUSessionModification [7] SMFPDUSessionModification,

pDUSessionRelease [8] SMFPDUSessionRelease,

startOfInterceptionWithEstablishedPDUSession [9] SMFStartOfInterceptionWithEstablishedPDUSession,

unsuccessfulSessionProcedure [10] SMFUnsuccessfulProcedure,

-- Subscriber-management related events, see clause 7.2.2

servingSystemMessage [11] UDMServingSystemMessage,

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

sMSMessage [12] SMSMessage,

-- LALS-related events, see clause 7.3.3

lALSReport [13] LALSReport,

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

pDHeaderReport [14] PDHeaderReport,

pDSummaryReport [15] PDSummaryReport,

-- MDF-related events, see clause 7.3.4

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

aMFIdentifierAssocation [62] AMFIdentifierAssocation,

mMEIdentifierAssocation [63] MMEIdentifierAssocation,

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

sMFPDUtoMAPDUSessionModification [64] SMFPDUtoMAPDUSessionModification,

-- NEF services related events, see clause 6.2.X

nEFdeviceTrigger [65] NEFDeviceTrigger,

nEFdeviceTriggerReplace [66] NEFDeviceTriggerReplace,

nEFdeviceTriggerCancellation [67] NEFDeviceTriggerCancellation,

nEFdeviceTriggerReportNotify [68] NEFDeviceTriggerReportNotify,

nEFMSISDNLessMOSMS [69] NEFMSISDNLessMOSMS,

nEFExpectedUEBehaviourUpdate [70] NEFExpectedUEBehaviourUpdate

}

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

}

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

-- HI4 LI notification payload

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

LINotificationPayload ::= SEQUENCE

{

lINotificationPayloadOID [1] RELATIVE-OID,

notification [2] LINotificationMessage

}

LINotificationMessage ::= CHOICE

{

lINotification [1] LINotification

}

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

-- NEF services definitions

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

-- See clause 6.2.X.3.1 for details of this structure

NEFDeviceTrigger ::= SEQUENCE

{

sUPI [1] SUPI,

gPSI [2] GPSI,

triggerId [3] NEFTriggerID,

aFID [4] AFID OPTIONAL,

triggerPayload [5] NEFTriggerPayload OPTIONAL,

validityPeriod [6] INTEGER OPTIONAL,

priorityDT [7] INTEGER OPTIONAL,

sourcePortId [8] PortNumber OPTIONAL,

destinationPortId [9] PortNumber OPTIONAL

}

-- See clause 6.2.X.3.2 for details of this structure

NEFDeviceTriggerReplace ::= SEQUENCE

{

sUPI [1] SUPI,

gPSI [2] GPSI,

triggerId [3] NEFTriggerID,

aFID [4] AFID OPTIONAL,

triggerPayload [5] NEFTriggerPayload OPTIONAL,

validityPeriod [6] INTEGER OPTIONAL,

priorityDT [7] INTEGER OPTIONAL,

sourcePortId [8] PortNumber OPTIONAL,

destinationPortId [9] PortNumber OPTIONAL

}

-- See clause 6.2.X.3.3 for details of this structure

NEFDeviceTriggerCancellation ::= SEQUENCE

{

sUPI [1] SUPI,

gPSI [2] GPSI,

triggerId [3] NEFTriggerID

}

-- See clause 6.2.X.3.4 for details of this structure

NEFDeviceTriggerReportNotify ::= SEQUENCE

{

sUPI [1] SUPI,

gPSI [2] GPSI,

triggerId [3] NEFTriggerID,

deviceTriggerDeliveryResult [4] NEFDeviceTriggerDeliveryResult

}

-- See clause 6.2.X.4.1 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 6.2.X.5.1 for details of this structure

NEFExpectedUEBehaviourUpdate ::= SEQUENCE

{

gPSI [1] GPSI,

expectedUEMovingTrajectory [2] SEQUENCE OF NEFLocationArea OPTIONAL,

stationaryIndication [3] NEFStationaryIndication OPTIONAL,

communicationDurationTime [4] INTEGER OPTIONAL,

periodicTime [5] INTEGER OPTIONAL,

scheduledCommunicationTime [6] NEFScheduledCommunicationTime OPTIONAL,

batteryIndication [7] NEFBatteryIndication OPTIONAL,

trafficProfile [8] NEFTrafficProfile OPTIONAL,

expectedTimeAndDayOfWeekInTrajectory [9] NEFexpectedTimeAndDayOfWeekInTrajectory OPTIONAL,

aFID [10] AFID,

validityTime [11] Timestamp OPTIONAL

}

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

-- NEF services parameters

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

AFID ::= UTF8String

NEFTriggerID ::= UTF8String

NEFTriggerPayload ::= OCTET STRING

NEFDeviceTriggerDeliveryResult ::= ENUMERATED

{

success (1),

unknown (2),

failure (3),

triggered (4),

expired (5),

unconfirmed (6),

replaced (7),

terminate (8)

}

NEFStationaryIndication ::= ENUMERATED

{

stationary (1),

mobile (2)

}

NEFBatteryIndication ::= ENUMERATED

{

batteryRecharge (1),

batteryReplace (2),

batteryNoRecharge (3),

batteryNoReplace (4),

noBattery (5)

}

NEFScheduledCommunicationTime ::= SEQUENCE

{

days [1] SEQUENCE OF Daytime

}

NEFexpectedTimeAndDayOfWeekInTrajectory::= SEQUENCE

{

days [1] SEQUENCE OF Daytime

}

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)

}

NEFTrafficProfile ::= ENUMERATED

{

singleTransUL (1),

singleTransDL (2),

dualTransULFirst (3),

dualTransDLFirst (4),

multiTrans (5)

}

NEFScheduledCommunicationType ::= ENUMERATED

{

downlinkOnly (1),

uplinkOnly (2),

bidirectional (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

}

-- 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

}

-- 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

}

-- 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

}

-- 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

}

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

-- 5G AMF parameters

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

AMFID ::= SEQUENCE

{

aMFRegionID [1] AMFRegionID,

aMFSetID [2] AMFSetID,

aMFPointer [3] AMFPointer

}

AMFDirection ::= ENUMERATED

{

networkInitiated(1),

uEInitiated(2)

}

AMFFailedProcedureType ::= ENUMERATED

{

registration(1),

sMS(2),

pDUSessionEstablishment(3)

}

AMFFailureCause ::= CHOICE

{

fiveGMMCause [1] FiveGMMCause,

fiveGSMCause [2] FiveGSMCause

}

AMFPointer ::= INTEGER (0..63)

AMFRegistrationResult ::= ENUMERATED

{

threeGPPAccess(1),

nonThreeGPPAccess(2),

threeGPPAndNonThreeGPPAccess(3)

}

AMFRegionID ::= INTEGER (0..255)

AMFRegistrationType ::= ENUMERATED

{

initial(1),

mobility(2),

periodic(3),

emergency(4)

}

AMFSetID ::= INTEGER (0..1023)

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

-- 5G SMF definitions

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

-- See clause 6.2.3.2.2 for details of this structure

SMFPDUSessionEstablishment ::= SEQUENCE

{

sUPI [1] SUPI OPTIONAL,

sUPIUnauthenticated [2] SUPIUnauthenticatedIndication OPTIONAL,

pEI [3] PEI OPTIONAL,

gPSI [4] GPSI OPTIONAL,

pDUSessionID [5] PDUSessionID,

gTPTunnelID [6] FTEID,

pDUSessionType [7] PDUSessionType,

sNSSAI [8] SNSSAI OPTIONAL,

uEEndpoint [9] SEQUENCE OF UEEndpointAddress OPTIONAL,

non3GPPAccessEndpoint [10] UEEndpointAddress OPTIONAL,

location [11] Location OPTIONAL,

dNN [12] DNN,

aMFID [13] AMFID OPTIONAL,

hSMFURI [14] HSMFURI OPTIONAL,

requestType [15] FiveGSMRequestType,

accessType [16] AccessType OPTIONAL,

rATType [17] RATType OPTIONAL,

sMPDUDNRequest [18] SMPDUDNRequest OPTIONAL,

uEEPSPDNConnection [19] UEEPSPDNConnection OPTIONAL

}

-- 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

}

-- 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

}

-- 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

}

-- See clause 6.2.3.2.6 for details of this structure

SMFUnsuccessfulProcedure ::= SEQUENCE

{

failedProcedureType [1] SMFFailedProcedureType,

failureCause [2] FiveGSMCause,

initiator [3] Initiator,

requestedSlice [4] NSSAI OPTIONAL,

sUPI [5] SUPI OPTIONAL,

sUPIUnauthenticated [6] SUPIUnauthenticatedIndication OPTIONAL,

pEI [7] PEI OPTIONAL,

gPSI [8] GPSI OPTIONAL,

pDUSessionID [9] PDUSessionID OPTIONAL,

uEEndpoint [10] SEQUENCE OF UEEndpointAddress OPTIONAL,

non3GPPAccessEndpoint [11] UEEndpointAddress OPTIONAL,

dNN [12] DNN OPTIONAL,

aMFID [13] AMFID OPTIONAL,

hSMFURI [14] HSMFURI OPTIONAL,

requestType [15] FiveGSMRequestType OPTIONAL,

accessType [16] AccessType OPTIONAL,

rATType [17] RATType OPTIONAL,

sMPDUDNRequest [18] SMPDUDNRequest OPTIONAL,

location [19] Location OPTIONAL

}

-- See clause 6.2.3.2.8 for details of this structure

SMFPDUtoMAPDUSessionModification ::= SEQUENCE

{

sUPI [1] SUPI OPTIONAL,

sUPIUnauthenticated [2] SUPIUnauthenticatedIndication OPTIONAL,

pEI [3] PEI OPTIONAL,

gPSI [4] GPSI OPTIONAL,

sNSSAI [5] SNSSAI OPTIONAL,

non3GPPAccessEndpoint [6] UEEndpointAddress OPTIONAL,

location [7] Location OPTIONAL,

requestType [8] FiveGSMRequestType,

accessType [9] AccessType OPTIONAL,

rATType [10] RATType OPTIONAL,

pDUSessionID [11] PDUSessionID,

requestIndication [12] RequestIndication,

aTSSSContainer [13] ATSSSContainer

}

-- See clause 6.2.3.2.7.1 for details of this structure

SMFMAPDUSessionEstablishment ::= SEQUENCE

{

sUPI [1] SUPI OPTIONAL,

sUPIUnauthenticated [2] SUPIUnauthenticatedIndication OPTIONAL,

pEI [3] PEI OPTIONAL,

gPSI [4] GPSI OPTIONAL,

pDUSessionID [5] PDUSessionID,

pDUSessionType [6] PDUSessionType,

accessInfo [7] SEQUENCE OF AccessInfo,

sNSSAI [8] SNSSAI OPTIONAL,

uEEndpoint [9] SEQUENCE OF UEEndpointAddress OPTIONAL,

location [10] Location OPTIONAL,

dNN [11] DNN,

aMFID [12] AMFID OPTIONAL,

hSMFURI [13] HSMFURI OPTIONAL,

requestType [14] FiveGSMRequestType,

sMPDUDNRequest [15] SMPDUDNRequest OPTIONAL,

servingNetwork [16] SMFServingNetwork,

oldPDUSessionID [17] PDUSessionID OPTIONAL,

mAUpgradeIndication [18] SMFMAUpgradeIndication OPTIONAL,

ePSPDNCnxInfo [19] SMFEPSPDNCnxInfo OPTIONAL,

mAAcceptedIndication [20] SMFMAAcceptedIndication,

aTSSSContainer [21] ATSSSContainer OPTIONAL

}

-- See clause 6.2.3.2.7.2 for details of this structure

SMFMAPDUSessionModification ::= SEQUENCE

{

sUPI [1] SUPI OPTIONAL,

sUPIUnauthenticated [2] SUPIUnauthenticatedIndication OPTIONAL,

pEI [3] PEI OPTIONAL,

gPSI [4] GPSI OPTIONAL,

pDUSessionID [5] PDUSessionID,

accessInfo [6] SEQUENCE OF AccessInfo OPTIONAL,

sNSSAI [7] SNSSAI OPTIONAL,

location [8] Location OPTIONAL,

requestType [9] FiveGSMRequestType OPTIONAL,

servingNetwork [10] SMFServingNetwork,

oldPDUSessionID [11] PDUSessionID OPTIONAL,

mAUpgradeIndication [12] SMFMAUpgradeIndication OPTIONAL,

ePSPDNCnxInfo [13] SMFEPSPDNCnxInfo OPTIONAL,

mAAcceptedIndication [14] SMFMAAcceptedIndication,

aTSSSContainer [15] ATSSSContainer OPTIONAL

}

-- See clause 6.2.3.2.7.3 for details of this structure

SMFMAPDUSessionRelease ::= SEQUENCE

{

sUPI [1] SUPI,

pEI [2] PEI OPTIONAL,

gPSI [3] GPSI OPTIONAL,

pDUSessionID [4] PDUSessionID,

timeOfFirstPacket [5] Timestamp OPTIONAL,

timeOfLastPacket [6] Timestamp OPTIONAL,

uplinkVolume [7] INTEGER OPTIONAL,

downlinkVolume [8] INTEGER OPTIONAL,

location [9] Location OPTIONAL,

cause [10] SMFErrorCodes OPTIONAL

}

-- See clause 6.2.3.2.7.4 for details of this structure

SMFStartOfInterceptionWithEstablishedMAPDUSession ::= SEQUENCE

{

sUPI [1] SUPI OPTIONAL,

sUPIUnauthenticated [2] SUPIUnauthenticatedIndication OPTIONAL,

pEI [3] PEI OPTIONAL,

gPSI [4] GPSI OPTIONAL,

pDUSessionID [5] PDUSessionID,

pDUSessionType [6] PDUSessionType,

accessInfo [7] SEQUENCE OF AccessInfo,

sNSSAI [8] SNSSAI OPTIONAL,

uEEndpoint [9] SEQUENCE OF UEEndpointAddress OPTIONAL,

location [10] Location OPTIONAL,

dNN [11] DNN,

aMFID [12] AMFID OPTIONAL,

hSMFURI [13] HSMFURI OPTIONAL,

requestType [14] FiveGSMRequestType OPTIONAL,

sMPDUDNRequest [15] SMPDUDNRequest OPTIONAL,

servingNetwork [16] SMFServingNetwork,

oldPDUSessionID [17] PDUSessionID OPTIONAL,

mAUpgradeIndication [18] SMFMAUpgradeIndication OPTIONAL,

ePSPDNCnxInfo [19] SMFEPSPDNCnxInfo OPTIONAL,

mAAcceptedIndication [20] SMFMAAcceptedIndication,

aTSSSContainer [21] ATSSSContainer OPTIONAL

}

-- See clause 6.2.3.2.7.5 for details of this structure

SMFMAUnsuccessfulProcedure ::= SEQUENCE

{

failedProcedureType [1] SMFFailedProcedureType,

failureCause [2] FiveGSMCause,

requestedSlice [3] NSSAI OPTIONAL,

initiator [4] Initiator,

sUPI [5] SUPI OPTIONAL,

sUPIUnauthenticated [6] SUPIUnauthenticatedIndication OPTIONAL,

pEI [7] PEI OPTIONAL,

gPSI [8] GPSI OPTIONAL,

pDUSessionID [9] PDUSessionID OPTIONAL,

accessInfo [10] SEQUENCE OF AccessInfo,

uEEndpoint [11] SEQUENCE OF UEEndpointAddress OPTIONAL,

location [12] Location OPTIONAL,

dNN [13] DNN OPTIONAL,

aMFID [14] AMFID OPTIONAL,

hSMFURI [15] HSMFURI OPTIONAL,

requestType [16] FiveGSMRequestType OPTIONAL,

sMPDUDNRequest [17] SMPDUDNRequest OPTIONAL

}

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

-- 5G SMF parameters

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

SMFFailedProcedureType ::= ENUMERATED

{

pDUSessionEstablishment(1),

pDUSessionModification(2),

pDUSessionRelease(3)

}

SMFServingNetwork ::= SEQUENCE

{

pLMNID [1] PLMNID,

nID [2] NID OPTIONAL

}

AccessInfo ::= SEQUENCE

{

accessType [1] AccessType,

rATType [2] RATType OPTIONAL,

gTPTunnelID [3] FTEID,

non3GPPAccessEndpoint [4] UEEndpointAddress OPTIONAL,

establishmentStatus [5] EstablishmentStatus,

aNTypeToReactivate [6] AccessType OPTIONAL

}

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

ATSSSContainer ::= OCTET STRING

EstablishmentStatus ::= ENUMERATED

{

established(0),

released(1)

}

SMFMAUpgradeIndication ::= BOOLEAN

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

SMFEPSPDNCnxInfo ::= UTF8String

SMFMAAcceptedIndication ::= BOOLEAN

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

SMFErrorCodes ::= UTF8String

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

UEEPSPDNConnection ::= OCTET STRING

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

RequestIndication ::= ENUMERATED

{

uEREQPDUSESMOD(0),

uEREQPDUSESREL(1),

pDUSESMOB(2),

nWREQPDUSESAUTH(3),

nWREQPDUSESMOD(4),

nWREQPDUSESREL(5),

eBIASSIGNMENTREQ(6),

rELDUETO5GANREQUEST(7)

}

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

-- 5G UPF definitions

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

UPFCCPDU ::= OCTET STRING

-- See clause 6.2.3.8 for the details of this structure

ExtendedUPFCCPDU ::= SEQUENCE

{

payload [1] UPFCCPDUPayload,

qFI [2] QFI OPTIONAL

}

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

-- 5G UPF parameters

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

UPFCCPDUPayload ::= CHOICE

{

uPFIPCC [1] OCTET STRING,

uPFEthernetCC [2] OCTET STRING,

uPFUnstructuredCC [3] OCTET STRING

}

QFI ::= INTEGER (0..63)

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

-- 5G UDM definitions

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

UDMServingSystemMessage ::= SEQUENCE

{

sUPI [1] SUPI,

pEI [2] PEI OPTIONAL,

gPSI [3] GPSI OPTIONAL,

gUAMI [4] GUAMI OPTIONAL,

gUMMEI [5] GUMMEI OPTIONAL,

pLMNID [6] PLMNID OPTIONAL,

servingSystemMethod [7] UDMServingSystemMethod,

serviceID [8] ServiceID OPTIONAL

}

UDMSubscriberRecordChangeMessage ::= SEQUENCE

{

sUPI [1] SUPI OPTIONAL,

pEI [2] PEI OPTIONAL,

gPSI [3] GPSI OPTIONAL,

oldPEI [4] PEI OPTIONAL,

oldSUPI [5] SUPI OPTIONAL,

oldGPSI [6] GPSI OPTIONAL,

oldserviceID [7] ServiceID OPTIONAL,

subscriberRecordChangeMethod [8] UDMSubscriberRecordChangeMethod,

serviceID [9] ServiceID OPTIONAL

}

UDMCancelLocationMessage ::= SEQUENCE

{

sUPI [1] SUPI,

pEI [2] PEI OPTIONAL,

gPSI [3] GPSI OPTIONAL,

gUAMI [4] GUAMI OPTIONAL,

pLMNID [5] PLMNID OPTIONAL,

cancelLocationMethod [6] UDMCancelLocationMethod

}

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

-- 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

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

-- 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

}

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

-- 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)

}

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

-- 5G LALS definitions

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

LALSReport ::= SEQUENCE

{

sUPI [1] SUPI OPTIONAL,

pEI [2] PEI OPTIONAL,

gPSI [3] GPSI OPTIONAL,

location [4] Location OPTIONAL

}

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

-- PDHR/PDSR definitions

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

PDHeaderReport ::= SEQUENCE

{

pDUSessionID [1] PDUSessionID,

sourceIPAddress [2] IPAddress,

sourcePort [3] PortNumber OPTIONAL,

destinationIPAddress [4] IPAddress,

destinationPort [5] PortNumber OPTIONAL,

nextLayerProtocol [6] NextLayerProtocol,

iPv6flowLabel [7] IPv6FlowLabel OPTIONAL,

direction [8] Direction,

packetSize [9] INTEGER

}

PDSummaryReport ::= SEQUENCE

{

pDUSessionID [1] PDUSessionID,

sourceIPAddress [2] IPAddress,

sourcePort [3] PortNumber OPTIONAL,

destinationIPAddress [4] IPAddress,

destinationPort [5] PortNumber OPTIONAL,

nextLayerProtocol [6] NextLayerProtocol,

iPv6flowLabel [7] IPv6FlowLabel OPTIONAL,

direction [8] Direction,

pDSRSummaryTrigger [9] PDSRSummaryTrigger,

firstPacketTimestamp [10] Timestamp,

lastPacketTimestamp [11] Timestamp,

packetCount [12] INTEGER,

byteCount [13] INTEGER

}

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

-- PDHR/PDSR parameters

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

PDSRSummaryTrigger ::= ENUMERATED

{

timerExpiry(1),

packetCount(2),

byteCount(3),

startOfFlow(4),

endOfFlow(5)

}

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

-- Identifier Association definitions

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

AMFIdentifierAssocation ::= 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

}

MMEIdentifierAssocation ::= 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

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

GUTI ::= SEQUENCE

{

mCC [1] MCC,

mNC [2] MNC,

mMEGroupID [3] MMEGroupID,

mMECode [4] MMECode,

mTMSI [5] TMSI

}

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

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

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

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

-- 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

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

-- Common Parameters

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

AccessType ::= ENUMERATED

{

threeGPPAccess(1),

nonThreeGPPAccess(2),

threeGPPandNonThreeGPPAccess(3)

}

Direction ::= ENUMERATED

{

fromTarget(1),

toTarget(2)

}

DNN ::= UTF8String

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

EmailAddress ::= UTF8String

FiveGGUTI ::= SEQUENCE

{

mCC [1] MCC,

mNC [2] MNC,

aMFRegionID [3] AMFRegionID,

aMFSetID [4] AMFSetID,

aMFPointer [5] AMFPointer,

fiveGTMSI [6] FiveGTMSI

}

FiveGMMCause ::= INTEGER (0..255)

FiveGSMRequestType ::= ENUMERATED

{

initialRequest(1),

existingPDUSession(2),

initialEmergencyRequest(3),

existingEmergencyPDUSession(4),

modificationRequest(5),

reserved(6),

mAPDURequest(7)

}

FiveGSMCause ::= INTEGER (0..255)

FiveGTMSI ::= INTEGER (0..4294967295)

FTEID ::= SEQUENCE

{

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

iPv4Address [2] IPv4Address OPTIONAL,

iPv6Address [3] IPv6Address OPTIONAL

}

GPSI ::= CHOICE

{

mSISDN [1] MSISDN,

nAI [2] NAI

}

GUAMI ::= SEQUENCE

{

aMFID [1] AMFID,

pLMNID [2] PLMNID

}

GUMMEI ::= SEQUENCE

{

mMEID [1] MMEID,

mCC [2] MCC,

mNC [3] MNC

}

HomeNetworkPublicKeyID ::= OCTET STRING

HSMFURI ::= UTF8String

IMEI ::= NumericString (SIZE(14))

IMEISV ::= NumericString (SIZE(16))

IMPI ::= NAI

IMPU ::= CHOICE

{

sIPURI [1] SIPURI,

tELURI [2] TELURI

}

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

Initiator ::= ENUMERATED

{

uE(1),

network(2),

unknown(3)

}

IPAddress ::= CHOICE

{

iPv4Address [1] IPv4Address,

iPv6Address [2] IPv6Address

}

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

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

IPv6FlowLabel ::= INTEGER(0..1048575)

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

MCC ::= NumericString (SIZE(3))

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

MMEID ::= SEQUENCE

{

mMEGI [1] MMEGI,

mMEC [2] MMEC

}

MMEC ::= NumericString

MMEGI ::= NumericString

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

NAI ::= UTF8String

NextLayerProtocol ::= INTEGER(0..255)

NonLocalID ::= ENUMERATED

{

local(1),

nonLocal(2)

}

NSSAI ::= SEQUENCE OF SNSSAI

PLMNID ::= SEQUENCE

{

mCC [1] MCC,

mNC [2] MNC

}

PDUSessionID ::= INTEGER (0..255)

PDUSessionType ::= ENUMERATED

{

iPv4(1),

iPv6(2),

iPv4v6(3),

unstructured(4),

ethernet(5)

}

PEI ::= CHOICE

{

iMEI [1] IMEI,

iMEISV [2] IMEISV

}

PortNumber ::= INTEGER(0..65535)

ProtectionSchemeID ::= INTEGER (0..15)

RATType ::= ENUMERATED

{

nR(1),

eUTRA(2),

wLAN(3),

virtual(4),

nBIOT(5),

wireline(6),

wirelineCable(7),

wirelineBBF(8),

lTEM(9),

nRU(10),

eUTRAU(11),

trustedN3GA(12),

trustedWLAN(13),

uTRA(14),

gERA(15)

}

RejectedNSSAI ::= SEQUENCE OF RejectedSNSSAI

RejectedSNSSAI ::= SEQUENCE

{

causeValue [1] RejectedSliceCauseValue,

sNSSAI [2] SNSSAI

}

RejectedSliceCauseValue ::= INTEGER (0..255)

RoutingIndicator ::= INTEGER (0..9999)

SchemeOutput ::= OCTET STRING

SIPURI ::= UTF8String

Slice ::= SEQUENCE

{

allowedNSSAI [1] NSSAI OPTIONAL,

configuredNSSAI [2] NSSAI OPTIONAL,

rejectedNSSAI [3] RejectedNSSAI OPTIONAL

}

SMPDUDNRequest ::= OCTET STRING

SNSSAI ::= SEQUENCE

{

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

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

}

SUCI ::= SEQUENCE

{

mCC [1] MCC,

mNC [2] MNC,

routingIndicator [3] RoutingIndicator,

protectionSchemeID [4] ProtectionSchemeID,

homeNetworkPublicKeyID [5] HomeNetworkPublicKeyID,

schemeOutput [6] SchemeOutput

}

SUPI ::= CHOICE

{

iMSI [1] IMSI,

nAI [2] NAI

}

SUPIUnauthenticatedIndication ::= BOOLEAN

TargetIdentifier ::= CHOICE

{

sUPI [1] SUPI,

iMSI [2] IMSI,

pEI [3] PEI,

iMEI [4] IMEI,

gPSI [5] GPSI,

mSISDN [6] MSISDN,

nAI [7] NAI,

iPv4Address [8] IPv4Address,

iPv6Address [9] IPv6Address,

ethernetAddress [10] MACAddress

}

TargetIdentifierProvenance ::= ENUMERATED

{

lEAProvided(1),

observed(2),

matchedOn(3),

other(4)

}

TELURI ::= UTF8String

Timestamp ::= GeneralizedTime

UEEndpointAddress ::= CHOICE

{

iPv4Address [1] IPv4Address,

iPv6Address [2] IPv6Address,

ethernetAddress [3] MACAddress

}

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

-- Location parameters

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

Location ::= SEQUENCE

{

locationInfo [1] LocationInfo OPTIONAL,

positioningInfo [2] PositioningInfo OPTIONAL,

locationPresenceReport [3] LocationPresenceReport OPTIONAL

}

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,

ageOfLocatonInfo [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,

ageOfLocatonInfo [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

}

-- 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

}

-- 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

}

-- 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], 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 29.518 [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 29.572 [24], clause 6.1.6.2.15

PositioningMethodAndUsage ::= SEQUENCE

{

method [1] PositioningMethod,

mode [2] PositioningMode,

usage [3] Usage,

methodCode [4] MethodCode OPTIONAL

}

-- TS 29.572 [24], clause 6.1.6.2.16

GNSSPositioningMethodAndUsage ::= SEQUENCE

{

mode [1] PositioningMode,

gNSS [2] GNSSID,

usage [3] Usage

}

-- TS 29.572 [24], clause 6.1.6.2.6

Point ::= SEQUENCE

{

geographicalCoordinates [1] GeographicalCoordinates

}

-- TS 29.572 [24], clause 6.1.6.2.7

PointUncertaintyCircle ::= SEQUENCE

{

geographicalCoordinates [1] GeographicalCoordinates,

uncertainty [2] Uncertainty

}

-- TS 29.572 [24], clause 6.1.6.2.8

PointUncertaintyEllipse ::= SEQUENCE

{

geographicalCoordinates [1] GeographicalCoordinates,

uncertainty [2] UncertaintyEllipse,

confidence [3] Confidence

}

-- TS 29.572 [24], clause 6.1.6.2.9

Polygon ::= SEQUENCE

{

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

}

-- TS 29.572 [24], clause 6.1.6.2.10

PointAltitude ::= SEQUENCE

{

point [1] GeographicalCoordinates,

altitude [2] Altitude

}

-- TS 29.572 [24], clause 6.1.6.2.11

PointAltitudeUncertainty ::= SEQUENCE

{

point [1] GeographicalCoordinates,

altitude [2] Altitude,

uncertaintyEllipse [3] UncertaintyEllipse,

uncertaintyAltitude [4] Uncertainty,

confidence [5] Confidence

}

-- TS 29.572 [24], clause 6.1.6.2.12

EllipsoidArc ::= SEQUENCE

{

point [1] GeographicalCoordinates,

innerRadius [2] InnerRadius,

uncertaintyRadius [3] Uncertainty,

offsetAngle [4] Angle,

includedAngle [5] Angle,

confidence [6] Confidence

}

-- TS 29.572 [24], clause 6.1.6.2.4

GeographicalCoordinates ::= SEQUENCE

{

latitude [1] UTF8String,

longitude [2] UTF8String,

mapDatumInformation [3] OGCURN OPTIONAL

}

-- TS 29.572 [24], clause 6.1.6.2.22

UncertaintyEllipse ::= SEQUENCE

{

semiMajor [1] Uncertainty,

semiMinor [2] Uncertainty,

orientationMajor [3] Orientation

}

-- TS 29.572 [24], clause 6.1.6.2.18

HorizontalVelocity ::= SEQUENCE

{

hSpeed [1] HorizontalSpeed,

bearing [2] Angle

}

-- TS 29.572 [24], clause 6.1.6.2.19

HorizontalWithVerticalVelocity ::= SEQUENCE

{

hSpeed [1] HorizontalSpeed,

bearing [2] Angle,

vSpeed [3] VerticalSpeed,

vDirection [4] VerticalDirection

}

-- TS 29.572 [24], clause 6.1.6.2.20

HorizontalVelocityWithUncertainty ::= SEQUENCE

{

hSpeed [1] HorizontalSpeed,

bearing [2] Angle,

uncertainty [3] SpeedUncertainty

}

-- TS 29.572 [24], clause 6.1.6.2.21

HorizontalWithVerticalVelocityAndUncertainty ::= SEQUENCE

{

hspeed [1] HorizontalSpeed,

bearing [2] Angle,

vSpeed [3] VerticalSpeed,

vDirection [4] VerticalDirection,

hUncertainty [5] SpeedUncertainty,

vUncertainty [6] SpeedUncertainty

}

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

Altitude ::= UTF8String

Angle ::= INTEGER (0..360)

Uncertainty ::= INTEGER (0..127)

Orientation ::= INTEGER (0..180)

Confidence ::= INTEGER (0..100)

InnerRadius ::= INTEGER (0..65535)

AgeOfLocationEstimate ::= INTEGER (0..32767)

HorizontalSpeed ::= UTF8String

VerticalSpeed ::= UTF8String

SpeedUncertainty ::= UTF8String

BarometricPressure ::= INTEGER (30000..155000)

-- TS 29.572 [24], clause 6.1.6.3.13

VerticalDirection ::= ENUMERATED

{

upward(1),

downward(2)

}

-- TS 29.572 [24], clause 6.1.6.3.6

PositioningMethod ::= ENUMERATED

{

cellID(1),

eCID(2),

oTDOA(3),

barometricPressure(4),

wLAN(5),

bluetooth(6),

mBS(7),

motionSensor(8),

dLTDOA(9),

dLAOD(10),

multiRTT(11),

nRECID(12),

uLTDOA(13),

uLAOA(14),

networkSpecific(15)

}

-- TS 29.572 [24], clause 6.1.6.3.7

PositioningMode ::= ENUMERATED

{

uEBased(1),

uEAssisted(2),

conventional(3)

}

-- TS 29.572 [24], clause 6.1.6.3.8

GNSSID ::= ENUMERATED

{

gPS(1),

galileo(2),

sBAS(3),

modernizedGPS(4),

qZSS(5),

gLONASS(6),

bDS(7),

nAVIC(8)

}

-- TS 29.572 [24], clause 6.1.6.3.9

Usage ::= ENUMERATED

{

unsuccess(1),

successResultsNotUsed(2),

successResultsUsedToVerifyLocation(3),

successResultsUsedToGenerateLocation(4),

successMethodNotDetermined(5)

}

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

TimeZone ::= UTF8String

-- Open Geospatial Consortium URN [35]

OGCURN ::= UTF8String

-- TS 29.572 [24], clause 6.1.6.2.15

MethodCode ::= INTEGER (16..31)

NEFLocationArea ::= CHOICE

{

geographicArea [1] GeographicArea,

civicAddress [2] CivicAddress,

nwAreaInfo [3] NwAreaInfo

}

NwAreaInfo ::= CHOICE

{

ecgi [1] ECGI,

ncgi [2] NCGI,

gRanNodeId [3] GlobalRANNodeID,

tai [4] TAI

}

END

End of all changes