**3GPP TSG-SA3 Meeting #78-LI-e-c *s3i200442***

**Online, , 11th Aug 2020 - 12th Aug 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **33.128** | **CR** | **0114** | **rev** | **1** | **Current version:** | **16.3.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

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| ***Title:*** |  | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | SA3-LI(OTD) | | | | | | | | | |
| ***Source to TSG:*** |  | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | LI16 | | | | |  | ***Date:*** | | | 2020-08-05 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *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-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | 33.128 is unclear in Clause 6.2.5.3 how the delivery restriction for IRI only delivery is supported and enforced at the SMSF and in Clause 6.2.5.4 how the delivery restriction for IRI only delivery is supported and enforced at the MDF2. Thus, may include CC to the LEMF in violation of the warrant. The contents of the SMS TPDU described in table 6.2.5-1 are unclear, so the references to TS 23.040 are clarified. The delivery from the SMSF is also missing message types that are required in Stage 1 and Stage 2 requirements. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Add normative language to 6.2.5.4 and correct the normative language of 6.2.5.3 for the MDF2 handing of IRI only warrant. Clarify the references to TS 23.040. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Failure to meet national regulatory requirements | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2,3.3, 6.2.5.1, New 6.2.5.1.X, New 6.2.5.1.Y, 6.2.5.2, new 6.2.5.2.A, new 6.2.5.B, new 6.2.5.C, new 6.2.5.D, 6.2.5.3, new 6.2.5.3.X, new 6.2.5.3.A, new 6.2.5.3.B, new 6.2.5.3.C, new 6.2.5.3.D, new 6.2.5.3.E, new 6.2.5.3.F, new 6.2.5.3.G, 6.2.5.4, Annex A, Annex C | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**\*\*\* Start of First MODIFICATION \*\*\***

# 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".

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

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

**\*\*\* Start of Second MODIFICATION \*\*\***

## 3.3 Abbreviations

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

ADMF LI Administration Function

CC Content of Communication

CSP Communication Service Provider

CUPS Control and User Plane Separation

IRI Intercept Related Information

LALS Lawful Access Location Services

LEA Law Enforcement Agency

LEMF Law Enforcement Monitoring Facility

LI Lawful Interception

LICF Lawful Interception Control Function

LI\_HI1 LI\_Handover Interface 1

LI\_HI2 LI\_Handover Interface 2

LI\_HI3 LI\_Handover Interface 3

LI\_HI4 LI\_Handover Interface 4

LIPF Lawful Interception Provisioning Function

LIR Location Immediate Request

LI\_SI Lawful Interception System Information Interface

LI\_X1 Lawful Interception Internal Interface 1

LI\_X2 Lawful Interception Internal Interface 2

LI\_X3 Lawful Interception Internal Interface 3

LTF Location Triggering Function

MDF Mediation and Delivery Function

MDF2 Mediation and Delivery Function 2

MDF3 Mediation and Delivery Function 3

NPLI Network Provided Location Information

O&M Operations and Management

POI Point Of Interception

SIRF System Information Retrieval Function

SOI Start Of Interception

SMS-SC Short Message Service Service Center

TF Triggering Function

xCC LI\_X3 Communications Content.

xIRI LI\_X2 Intercept Related Information

**\*\*\* Start of Third MODIFICATION \*\*\***

#### 6.2.5.1 Provisioning over LI\_X1

##### 6.2.5.1.X Provisioning of the IRI-POI in the SMSF

The IRI-POI present in the SMSF is provisioned over LI\_X1 by the LIPF using the X1 protocol as described in Clause 5.2.2.

The POI in the SMSF shall support the following target identifier formats in the ETSI TS 103 221-1 [7] messages:

- SUPIIMSI.

- SUPINAI.

- PEIIMEI.

- PEIIMEISV.

- GPSIMSISDN.

- GPSINAI.

Table 6.2.5-X shows the minimum details of the LI\_X1 ActivateTask message used for provisioning the IRI-POI in the SMSF.

Table 6.2.5-X: ActivateTask message for the IRI-POI in the SMSF

|  |  |  |
| --- | --- | --- |
| ETSI TS 103 221-1 field name | Description | M/C/O |
| XID | XID assigned by LIPF. | M |
| TargetIdentifiers | One or more of the target identifiers listed in the paragraph above. | M |
| DeliveryType | Set to “X2Only”. | M |
| ListOfDIDs | Delivery endpoints for LI\_X2 for the IRI-POI in the SMSF. These delivery endpoints are configured using the CreateDestination message as described in ETSI TS 103 221-1 [7], Clause 6.3.1 prior to the task activation. | M |
| TaskDetailsExtensions/  SMSFExtensions | See Table 6.2.5-Y | M |

Table 6.2.5-Y: TruncateTPUserData Parameters

|  |  |  |
| --- | --- | --- |
| Field Name | Description | M/C/O |
| TruncateTPUserData | If set to True, the truncatedSMSTPDU field of the sMSTPDUData structure shall be used when applicable (See Clause 6.2.5.3 and Clause 6.2.5.4). If absent or set to False, the sMSTPDU field of the sMSTPDUData structure shall always be used. See table 6.2.5-A. | M |

##### 6.2.5.1.Y Provisioning of the MDF2

The MDF2 listed as the delivery endpoint for the LI\_X2 generated by the IRI-POI in the SMSF shall be provisioned over LI\_X1 by the LIPF using the X1 protocol as described in Clause 5.2.2. If SMS Content delivery is not authorized, the MDF2 shall be provisioned with the TruncateTPUserData parameter set to True, otherwise, it shall be set to False or absent.

Table 6.2.5-Z shows the minimum details of the LI\_X1 ActivateTask message used for provisioning the MDF2.

Table 6.2.5-Z: ActivateTask message for MDF2

|  |  |  |
| --- | --- | --- |
| ETSI TS 103 221-1 field name | Description | M/C/O |
| XID | XID assigned by LIPF. | M |
| TargetIdentifiers | One or more of the target identifiers listed in 6.2.5.1.X. | M |
| DeliveryType | Set to “X2Only”. (Ignored by the MDF2) | M |
| ListOfDIDs | Delivery endpoints for LI\_X2 for the IRI-POI in the SMSF. These delivery endpoints are configured using the CreateDestination message as described in ETSI TS 103 221-1 [7], Clause 6.3.1 prior to the task activation. | M |
| ListOfMediationDetails | Sequence of Mediation Details, See Table 6.2.5-B | M |
| TaskDetailsExtensions/  SMSFExtensions | See Table 6.2.5-Y | M |

Table 6.2.5-B: Mediation Details for MDF2

|  |  |  |
| --- | --- | --- |
| ETSI TS 103 221-1 field name | Description | M/C/O |
| LIID | Lawful Intercept ID associated with the task | M |
| DeliveryType | Set to "HI2Only" | M |
| ListOfDIDs | Details of where to send the IRI for this LIID. Shall be included if deviation from th ListofDIDs in the ActivateTask message is necessary. If included, the ListOfDIDs in the Mediation Details shall be used instead of any delivery destinations specified in the ListOfDIDs field in the ActivateTask Message. | C |
| ServiceScoping | Shall be included to Identify the service(s) and associated service-related delivery settings for this LIID. May include more than one instance of this parameter to allow for different combinations of subparameters associated with a single LIID. This parameter is defined in ETSI TS 103 221-1 [7], Annex C, Table C.2. | M |

#### 6.2.5.2 Generation of xIRI over LI\_X2

##### 6.2.5.2.A General

The IRI-POI present in the SMSF shall send xIRI over LI\_X2 for the event listed in TS 33.127 [5] Clause 6.2.5.3, the details of which are described in the following sub-clauses.

The SMSF may receive SMS TPDUs from the UE, destined to the SMS-SC, in Relay Layer Protocols (RP) messages (RP DATA, RP ACK, or RP ERROR as described in TS 24.011[XX], Clause 7.3 and all sub-clauses) carried as the RPDUs of CP-DATA messages (as described in TS 24.011[XX], Clause 7.2 and all sub-clauses). These CP-DATA messages are carried via Nsmsf\_SMService\_UplinkSMS messages from the AMF (as described in TS 29.540 [21], Clause 5.2.2.4). In the following clauses, the SMS TPDUs from the UE to the SMS-SC are referenced as upstream messages.

The SMSF may receive SMS TPDUs from the SMS-SC, destined to the UE, carried as the SM-RP-UI parameter of MAP-MO-FORWARD-SHORT-MESSAGE service messages or MAP-MT-FORWARD-SHORT-MESSAGE service messages (as described in TS 29.002 [XY], Clause 12). The MAP messages may be of the request type or the response type. The SMS TPDUs are forwarded to the UE in RP messages (RP DATA, RP ACK, or RP ERROR) as described in TS 24.011[XX], Clause 7.3 and all sub-clauses) carried as the RPDUs of CP-DATA messages (as described in TS 24.011[XX], Clause 7.2 and all sub-clauses). These CP-DATA messages are carried via Namf\_Communication\_N1N2MessageTransfer Requests (see TS 29.518 [22]). In the following clauses, the SMS TPDUs from the SMS-SC to the UE are referenced as downstream messages.

##### 6.2.5.2.B SMSMessage record

The IRI-POI in the SMSF shall generate an xIRI containing an SMSMessage record whenever the SMSF receives a message containing an SMS TPDU of the SMS-DELIVER type or the SMS-SUBMIT type from a target or destined to a target. For details of the payload for the SMSMessage record, see Clause 6.2.5.3.

When a target UE attempts to send an SMS message or when any UE attempts to send an SMS message destined to a target, the IRI POI in the SMSF shall generate an xIRI containing an SMSMessage record with the messageType of submit. This is indicated when the SMSF detects the following events:

- The SMSF receives an upstream SMS-SUBMIT TPDU message originating from a target UE.

- The SMSF receives an upstream SMS-SUBMIT TPDU message originating from any UE destined to a target UE.

When an SMS message delivery to a target UE is attempted or when an SMS message delivery originated from a target is attempted to any UE, the IRI-POI in the SMSF shall generate an xIRI containing an SMSMessage record with the messageType of deliver. This is indicated when the SMSF detects the following events:

- The SMSF receives a downstream SMS-DELIVER TPDU destined to any UE originating from a target UE.

- The SMSF receives a downstream SMS-DELIVER TPDU destined to a target UE.

##### 6.2.5.2.C SMSReport record

The IRI-POI in the SMSF shall generate an xIRI containing an SMSReport record whenever the SMSF receives a message containing an SMS TPDU of the SMS-SUBMIT-REPORT, SMS-DELIVER-REPORT or SMS-STATUS-REPORT type containing a report about a previously sent message from a target or to a target. For details of the payload for the SMSReport record, see Clause 6.2.5.X.

When information about an SMS message sent by a target is reported to the target, or when information about a message sent to a target is reported to the originating UE, the IRI POI in the SMSF shall generate an xIRI containing an SMSReport record with the messageType of submitReport. This is indicated when the SMSF detects the following events:

- The SMSF sends a downstream SMS-SUBMIT-REPORT TPDU destined for a target UE.

- The SMSF sends a downstream SMS-SUBMIT-REPORT TPDU in response to an SMS-SUBMIT TPDU previously sent with a TP-DA field containing a target ID.

When an SMS message is successfully delivered to a target UE or when an SMS message originated from a target is successfully delivered to any UE, the IRI-POI in the SMSF shall generate an xIRI containing an SMSReport record with the messageType of deliverReport. This is indicated when the SMSF detects the folloing events:

- The SMSF receives an upstream SMS-DELIVER-REPORT TPDU from a target UE.

- The SMSF receives an SMS-DELIVER-REPORT TPDU in response to a previously sent SMS-DELIVER TPDU with a TP-OA field containing a target ID.

When the status of a previously sent message is sent to a target or when the status of a message previously sent to a target is sent to any UE, the IRI-POI in the SMSF shall generate an xIRI containing an SMSReport record with the messageType of statusReport. This is indicated by the following events:

- The SMSF sends an SMS-STATUS-REPORT TPDU in response to an SMS-COMMAND TPDU or SMS-SUBMIT TPDU sent by a target ID.

- The SMSF sends an SMS-STATUS-REPORT TPDU in response to an SMS-SUBMIT TPDU or SMS-COMMAND TPDU previously sent with a TP-RA field containing a target ID.

##### 6.2.5.2.D SMSCommand record

The IRI-POI in the SMSF shall generate an xIRI containing an SMSCommand record whenever the SMSF receives a message containing an SMS TPDU of the SMS-COMMAND type from a target or about a previously sent message to a target. For details of the payload for the SMSCommand record, see Clause 6.2.5.Y.

This is indicated when the SMSF detects the following events:

- The SMSF receives an SMS-COMMAND TPDU from a target UE.

- The SMSF receives an SMS-COMMAND TPDU with the TP-DA field containing a target ID.

**\*\*\* Start of Fourth MODIFICATION \*\*\***

#### 6.2.5.3 SMS Message

##### 6.2.5.3.X General

If the TruncateTPUserData field of the ActivateTask message is set to True, the truncatedSMSTPDU field shall be used in xIRI containing the SMSMessage record, otherwise, the sMSTPDU field shall be used.

NOTE 1: VOID

Table 6.2.5-1: Payload for SMSMessage record

|  |  |  |
| --- | --- | --- |
| Field name | Description | M/C/O |
| originatingSMSParty | Identity of the originating SMS party. See Clause 6.2.5.3.A | M |
| terminatingSMSParty | Identity of the terminating SMS party. See Clause 6.2.5.3.B | M |
| direction | Direction of the SMS with respect to the target. See 6.2.5.3.C | M |
| transferStatus | Indicates whether the transfer succeeded or not. See 6.2.5.3.D. | M |
| otherMessage | In the event of a server-initiated transfer, indicates whether the server will send another SMS. May be omitted if the transfer is target-initiated. See 6.2.5.3.E. | C |
| peerNFAddress | Address of the other network function (SMS-GMSC/IWMSC/SMS-Router) involved in the communication of the SMS, if available. | C |
| peerNFType | Type of the other network function (SMS-GMSC/IWMSC/SMS-Router) involved in the communication of the SMS, if available. | C |
| location | Location information associated with the target sending or receiving the SMS, if available. See 6.2.5.3.F.  Encoded as a *userLocation* parameter (*location>locationInfo>userLocation*), see Annex A. | C |
| messageType | Identifies the SMS TPDU type, per TS 23.040 [18] Clause 9.2.2.  See Clause 6.2.5.G | M |
| sMSTPDUData | See Table 6.2.5-A | M |

Table 6.2.5-A: sMSTPDUData field

|  |  |
| --- | --- |
| Field name | Description |
| sMSTPDU | SM-TL PDU encoded per the PDUs defined in TS 23.040 [18] Clause 9.2.2. |
| truncatedSMSTPDU | SM-TL PDU encoded per the PDUs defined in TS 23.040 [18] Clause 9.2.2 but truncated to remove TP-User-Data (TS 23.040 [18] Clause 9.2.3.24). |

NOTE 2: VOID

NOTE 3: VOID

NOTE 4: VOID

NOTE 5: VOID

NOTE 6: VOID

NOTE 7: VOID

NOTE 8: VOID

##### 6.2.5.3.A originatingSMSParty

For all upstream SMS TPDUs, the SMSF shall use the UEContext indicated in the Nsmsf\_SMService\_UplinkSMS service POST request as the originatingSMSParty (i.e. …/ue-contexts/{supi}, per TS 29.540 [21], Clause 5.2.2.2.2). If the SMSF has other identifiers stored as part of the UeSmsContextData (e.g. PEI, GPSI, see TS 29.540 [21], Clause 6.1.6.2.2), these identifiers shall be provided in addition to the SUPI as part of the originatingSMSParty parameter of the xIRI.

For SMSMessage records of the messageType deliver, the IRI POI in the SMSF shall set the originatingSMSParty field using the TP-OA field of the SMS TPDU.

##### 6.2.5.3.B terminatingSMSParty

For SMSMessage records of the messageType submit, the IRI POI in the SMSF shall set the terminatingSMSParty field using the TP-DA field of the SMS TPDU. If the SMSF has other identifiers stored as part of the UeSmsContextData (e.g. PEI, GPSI, SUPI, see TS 29.540 [21], Clause 6.1.6.2.2), these identifiers shall be provided in addition to the identifier in the TP-DA field of the SMS TPDU as part of the terminatingSMSParty parameter of the xIRI.

For SMSMessage records of the messageType deliver, the SMSF shall set the terminatingSMSParty field using the RP-Destination Address of the RP-DATA message (see TS 24.011[XX], Clause 7.3.1 and Clause 8.2.5.2).

For SMSCommand records, the IRI POI in the SMSF shall set the originalTerminatingSMSParty field using the TP-DA of the SMS-COMMAND message.

For downstream SMSReport records, the IRI POI in the SMSF shall set the terminatingSMSParty to the identifier used in the Namf\_Communication\_N1N2MessageTransfer message. If the SMSF has other identifiers stored as part of the UeSmsContextData (e.g. PEI, GPSI, SUPI, see TS 29.540 [21], Clause 6.1.6.2.2), these identifiers shall be provided in addition to the identifier that triggered the xIRI as part of the terminatingSMSParty parameter of the xIRI.

##### 6.2.5.3.C direction

For upstream cases, for SMS messages originated from the target UE, the value fromTarget is used and for SMS messages destined to the target, the toTarget is used. For downstream cases, for SMS messages terminated to the target UE, the value toTarget is used and for SMS messages originated from a target Non-local ID, the fromTarget is used.

##### 6.2.5.3.D transferStatus

This field is set to transferSucceeded or transferFailed as follows:

- Upstream cases:

- To transferSucceeded: when the IRI-POI in the SMSF detects that SMSF sends the MO-FORWARD-SHORT-MESSAGE-request [SMS-SUBMIT] message to the SMS-IWMSC.

- To transferFailed: when the IRI-POI in SMSF detects the scenarios where SMSF cannot send the MO-FORWARD-SHORT-MESSAGE-request [SMS-SUBMIT] to SMS-IWMSC, but still generates an xIRI containing the SMSMessage record.

- Downstream cases:

- To transferSucceeded: when the IRI-POI in the SMSF detects that SMSF sends the MT-FORWARD-SHORT-MESSAGE-answer [SMS-DELIVER-REPORT] message to the SMS-IWMSC.

- To transferFailed: when the IRI-POI in SMSF detects the scenarios where SMSF cannot send the MT-FORWARD-SHORT-MESSAGE-Answer [SMS-DELIVER-REPORT] to the SMS-GMSC, but an xIRI containing the SMSMessage record is still generated.

##### 6.2.5.3.E otherMessage

This is only applicable to downstream TPDUs and can be derived from the TP-MMS (More Message to Send) field present in the SMS-DELIVER TPDU sent to the UE (via AMF in the Namf\_Communications\_N1N2MessageTransfer).

##### 6.2.5.3.F location

This is derived from the ueLocation field of SmsRecord IE received from the AMF in the Nsmsf\_SMService\_UplinkSMS message (TS 29.540 [21]). For the cases where the TPDU is sent upstream, the SMCP message is CP-DATA\_RP-DATA [SMS-SUBMIT] and for cases where the TPDU is downstream, the SMCP message is CP-DATA\_RP-ACK [SMS-DELIVER-REPORT]. The SMSF shall only populate this parameter of the UE being served by the SMSF is the target.

##### 6.2.5.3.G messageType

The messageType field of the SMSMessage record shall be populated with the values listed in table 6.2.5-D based on the message type of the SMS TPDU that triggered the generation of the xIRI.

Table 6.2.5-D: messageType values

|  |  |
| --- | --- |
| SMS TPDU Type | messageType value |
| SMS-DELIVER | deliver |
| SMS-DELIVER-REPORT | deliverReport |
| SMS-STATUS-REPORT | statusReport |
| SMS-COMMAND | command |
| SMS-SUBMIT | Submit |
| SMS-SUBMIT-REPORT | submitReport |
| Reserved | reserved |

#### 6.2.5.X SMSReport Record

The sMSTPDU field shall always be used for the sMSTPDUData field of the SMSReport record.

Table 6.2.5-XX: Payload for SMSReport record

|  |  |  |
| --- | --- | --- |
| Field name | Description | M/C/O |
| originatingSMSParty | Identity of the originating SMS party. See Clause 6.2.5.3.A | C |
| terminatingSMSParty | Identity of the terminating SMS party. See Clause 6.2.5.3.B | C |
| targetIdentifier | The identifier that triggered the xIRI | M |
| otherMessage | In the event of a server-initiated transfer, indicates whether the server will send another SMS. May be omitted if the transfer is target-initiated. See 6.2.5.3.E. | C |
| peerNFAddress | Address of the other network function (SMS-GMSC/IWMSC/SMS-Router) involved in the communication of the SMS, if available. | C |
| peerNFType | Type of the other network function (SMS-GMSC/IWMSC/SMS-Router) involved in the communication of the SMS, if available. | C |
| location | Location information associated with the target sending or receiving the SMS, if available. See 6.2.5.3.F.  Encoded as a *userLocation* parameter (*location>locationInfo>userLocation*), see Annex A. | C |
| messageType | Identifies the SMS TPDU type, per TS 23.040 [18] Clause 9.2.2, see Clause 6.2.5.G | M |
| sMSTPDUData | sMSTPDU as defined in Table 6.2.5-A | M |

#### 6.2.5.Y SMSCommand Record

The sMSTPDU field shall always be used for the sMSTPDUData field of the SMSReport record.

Table 6.2.5-XX: Payload for SMSCommand record

|  |  |  |
| --- | --- | --- |
| Field name | Description | M/C/O |
| originatingSMSParty | Identity of the originating SMS party. See Clause 6.2.5.3.A | C |
| originalTerminatingSMSParty | Identity of the SMS party that was the terminating party of the SMS-SUBMIT referred to by the SMS-COMMAND (contained in the SMS-COMMAND TP-DA field) (See TS 23.040, Clause 9.2.2.4). See Clause 6.2.5.3.B | C |
| targetIdentifier | The identifier that triggered the xIRI | M |
| peerNFAddress | Address of the other network function (SMS-GMSC/IWMSC/SMS-Router) involved in the communication of the SMS, if available. | C |
| peerNFType | Type of the other network function (SMS-GMSC/IWMSC/SMS-Router) involved in the communication of the SMS, if available. | C |
| location | Location information associated with the target sending or receiving the SMS, if available. See 6.2.5.3.F.  Encoded as a *userLocation* parameter (*location>locationInfo>userLocation*), see Annex A. | C |
| messageType | Identifies the SMS TPDU type, per TS 23.040 [18] Clause 9.2.2, see Clause 6.2.5.G | M |
| sMSTPDUData | sMSTPDU as defined in Table 6.2.5-A | M |

**\*\*\* Start of Fifth MODIFICATION \*\*\***

#### 6.2.5.4 Generation of IRI over LI\_HI2

When an xIRI containing the SMSMessage record, SMSReport record, or SMSCommand record is received over LI\_X2 from the IRI-POI in SMSF, the MDF2 shall send the IRI message over LI\_HI2 without undue delay. The SMSMessage record, SMSReport record, or SMSCommand record may be enriched by other information available at the MDF2 (e.g. additional location information).

If the MDF2 is provisioned with the TruncateTPUserData parameter set to True, the truncatedSMSTPDU field shall be used in SMSMessage IRI message, otherwise, the sMSTPDU field shall always be used.

The threeGPP33128DefinedIRI field (see ETSI TS 102 232-7 [10] Clause 15) shall be populated with the BER-encoded IRIPayload.

The timestamp field of the psHeader structure shall be set to the time that the SMSF event was observed (i.e. the timestamp field of the xIRI). The LIID and CID fields shall correctly reflect the target identity and communication session to which the IRI belongs.

Each SMSCommand record shall be delivered as an IRI REPORT (see ETSI TS 102 232-1 [9] Clause 5.2.10) with a new CIN assigned (see ETSI TS 102 232-1 [9] Clause 5.2.4).

Each SMSReport record shall be delivered as an IRI REPORT (see ETSI TS 102 232-1 [9] Clause 5.2.10) with the CIN set to the CIN (see ETSI TS 102 232-1 [9] Clause 5.2.4) of the SMSMessage or SMSCommand record that the TPDU that triggered the SMSReport is in response to.

**\*\*\* Start of Sixth MODIFICATION \*\*\***

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) r16(16) version3(3)}

DEFINITIONS IMPLICIT TAGS EXTENSIBILITY IMPLIED ::=

BEGIN

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

-- Relative OIDs

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

tS33128PayloadsOID RELATIVE-OID ::= {threeGPP(4) ts33128(19) r16(16) version3(3)}

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

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

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

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

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

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

-- X2 xIRI payload

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

XIRIPayload ::= SEQUENCE

{

xIRIPayloadOID [1] RELATIVE-OID,

event [2] XIRIEvent

}

XIRIEvent ::= CHOICE

{

-- Access and mobility related events, see clause 6.2.2

registration [1] AMFRegistration,

deregistration [2] AMFDeregistration,

locationUpdate [3] AMFLocationUpdate,

startOfInterceptionWithRegisteredUE [4] AMFStartOfInterceptionWithRegisteredUE,

unsuccessfulAMProcedure [5] AMFUnsuccessfulProcedure,

-- PDU session-related events, see clause 6.2.3

pDUSessionEstablishment [6] SMFPDUSessionEstablishment,

pDUSessionModification [7] SMFPDUSessionModification,

pDUSessionRelease [8] SMFPDUSessionRelease,

startOfInterceptionWithEstablishedPDUSession [9] SMFStartOfInterceptionWithEstablishedPDUSession,

unsuccessfulSMProcedure [10] SMFUnsuccessfulProcedure,

-- Subscriber-management related events, see clause 7.2.2

servingSystemMessage [11] UDMServingSystemMessage,

-- SMS-related events, see clause 6.2.5

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

}

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

-- X3 xCC payload

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

-- No explicit payload required in release 15, see clause 6.2.3.5

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

-- 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

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

}

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

}

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

-- HI4 LI notification payload

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

LINotificationPayload ::= SEQUENCE

{

lINotificationPayloadOID [1] RELATIVE-OID,

notification [2] LINotificationMessage

}

LINotificationMessage ::= CHOICE

{

lINotification [1] LINotification

}

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

-- 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

}

-- 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

}

-- 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

}

-- 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

}

-- 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

}

-- 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

}

-- 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

}

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

-- 5G SMF parameters

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

SMFFailedProcedureType ::= ENUMERATED

{

pDUSessionEstablishment(1),

pDUSessionModification(2),

pDUSessionRelease(3)

}

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

-- 5G UPF parameters

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

UPFCCPDU ::= OCTET STRING

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

-- 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

}

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

-- 5G UDM parameters

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

UDMServingSystemMethod ::= ENUMERATED

{

amf3GPPAccessRegistration(0),

amfNon3GPPAccessRegistration(1),

unknown(2)

}

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

-- 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,

transferStatus [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

}

SMSReport ::= SEQUENCE

{

originatingSMSParty [1] SMSParty OPTIONAL,

terminatingSMSParty [2] SMSParty OPTIONAL,

targetIdentifier [3] SMSParty,

otherMessage [5] SMSOtherMessageIndication OPTIONAL,

location [6] Location OPTIONAL,

peerNFAddress [7] SMSNFAddress OPTIONAL,

peerNFType [8] SMSNFType OPTIONAL,

location [9] Location OPTIONAL,

sMSTPDUData [10] SMSTPDUData OPTIONAL,

messageType [11] SMSMessageType OPTIONAL

}

SMSCommand ::= SEQUENCE

{

originatingSMSParty [1] SMSParty OPTIONAL,

originalTerminatingSMSParty [2] SMSParty OPTIONAL,

targetIdentifier [3] SMSParty,

location [6] Location OPTIONAL,

peerNFAddress [7] SMSNFAddress OPTIONAL,

peerNFType [8] SMSNFType OPTIONAL,

location [9] Location OPTIONAL,

sMSTPDUData [10] SMSTPDUData OPTIONAL,

messageType [11] SMSMessageType OPTIONAL

}

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

-- 5G SMSF parameters

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

SMSMessageType ::= ENUMERATED

{

command (0),

deliver (1),

deliverReport (2),

statusReport (3),

submit (4),

submitReport (5)

reserved (6)

}

SMSParty ::= SEQUENCE

{

sUPI [1] SUPI OPTIONAL,

pEI [2] PEI OPTIONAL,

gPSI [3] GPSI 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)

}

SMSTPDUData ::= CHOICE

{

sMSTPDU [1] SMSTPDU,

truncatedSMSTPDU [2] TruncatedSMSTPDU

}

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

TargetIdentifierFieldType ::= CHOICE

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

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

-- 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)

}

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

-- 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))

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))

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)

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)

}

RejectedNSSAI ::= SEQUENCE OF RejectedSNSSAI

RejectedSNSSAI ::= SEQUENCE

{

causeValue [1] RejectedSliceCauseValue,

sNSSAI [2] SNSSAI

}

RejectedSliceCauseValue ::= INTEGER (0..255)

RoutingIndicator ::= INTEGER (0..9999)

SchemeOutput ::= OCTET STRING

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,

mISDN [6] MSISDN,

nAI [7] NAI,

iPv4Address [8] IPv4Address,

iPv6Address [9] IPv6Address,

ethernetAddress [10] MACAddress

}

TargetIdentifierProvenance ::= ENUMERATED

{

lEAProvided(1),

observed(2),

matchedOn(3),

other(4)

}

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

}

-- 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

}

ANNodeID ::= CHOICE

{

n3IWFID [1] N3IWFIDSBI,

gNbID [2] GNbID,

nGENbID [3] NGENbID

}

-- 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

}

-- TS 29.571 [17], clause 5.4.4.5

ECGI ::= SEQUENCE

{

pLMNID [1] PLMNID,

eUTRACellID [2] EUTRACellID

}

-- TS 29.571 [17], clause 5.4.4.6

NCGI ::= SEQUENCE

{

pLMNID [1] PLMNID,

nRCellID [2] NRCellID

}

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 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

}

-- 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

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

}

-- TS 29.572 [24], clause 6.1.6.2.15

PositioningMethodAndUsage ::= SEQUENCE

{

method [1] PositioningMethod,

mode [2] PositioningMode,

usage [3] Usage

}

-- 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),

barometricPresure(4),

wLAN(5),

bluetooth(6),

mBS(7)

}

-- 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)

}

-- 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

END

**\*\*\* Start of Seventh MODIFICATION \*\*\***

Annex C (normative): XSD Schema for LI\_X1 extensions

<?xml version="1.0" encoding="utf-8"?>

<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"

xmlns="urn:3GPP:ns:li:3GPPX1Extensions:r16:v2"

targetNamespace="urn:3GPP:ns:li:3GPPX1Extensions:r16:v2"

elementFormDefault="qualified">

<xs:complexType name="X1Extensions">

<xs:sequence>

<xs:element name="Extension" type="X1Extension" minOccurs="1" maxOccurs="unbounded"></xs:element>

</xs:sequence>

</xs:complexType>

<xs:complexType name="UPFLIT3TargetIdentifierExtensions">

<xs:sequence>

<xs:element name="UPFLIT3TargetIdentifier" type="UPFLIT3TargetIdentifier" minOccurs="1" maxOccurs="unbounded"></xs:element>

</xs:sequence>

</xs:complexType>

<xs:complexType name="UPFLIT3TargetIdentifier">

<xs:choice>

<xs:element name="FSEID" type="FSEID"></xs:element>

<xs:element name="PDRID" type="xs:unsignedInt"></xs:element>

<xs:element name="QERID" type="xs:unsignedInt"></xs:element>

<xs:element name="NetworkInstance" type="xs:hexBinary"></xs:element>

<xs:element name="GTPTunnelDirection" type="GTPTunnelDirection"></xs:element>

<xs:element name="FTEID" type="FTEID"></xs:element>

</xs:choice>

</xs:complexType>

<xs:complexType name="FSEID">

<xs:sequence>

<xs:element name="SEID" type="xs:unsignedLong"></xs:element>

<xs:element name="IPv4Address" type="IPv4Address" minOccurs="0"></xs:element>

<xs:element name="IPv6Address" type="IPv6Address" minOccurs="0"></xs:element>

</xs:sequence>

</xs:complexType>

<xs:complexType name="FTEID">

<xs:sequence>

<xs:element name="TEID" type="xs:unsignedInt"></xs:element>

<xs:element name="IPv4Address" type="IPv4Address" minOccurs="0"></xs:element>

<xs:element name="IPv6Address" type="IPv6Address" minOccurs="0"></xs:element>

</xs:sequence>

</xs:complexType>

<xs:simpleType name="GTPTunnelDirection">

<xs:restriction base="xs:string">

<xs:enumeration value="Outbound"></xs:enumeration>

<xs:enumeration value="Inbound"></xs:enumeration>

</xs:restriction>

</xs:simpleType>

<xs:complexType name="X1Extension">

<xs:choice>

<xs:element name="LALSLILCSTargetProvisioning" type="LALSLILCSTargetProvisioningExtensions"></xs:element>

<xs:element name="LALSLTFProvisioning" type="LALSLTFProvisioningExtensions"></xs:element>

<xs:element name="HeaderReporting" type="PDHRReportingExtensions"></xs:element>

<xs:element name="SMSFExtensions" type="SMSFProvisioningExtensions"></xs:element>

</xs:choice>

</xs:complexType>

<xs:complexType name="LALSLILCSTargetProvisioningExtensions">

<xs:sequence>

<xs:element name="PositioningServiceType" type="PositioningServiceType"></xs:element>

<xs:element name="PositioningPeriodicity" type="PositioningPeriodicity" minOccurs="0"></xs:element>

<xs:element name="PositioningParameters" type="PositioningParameters" minOccurs="0"></xs:element>

</xs:sequence>

</xs:complexType>

<xs:simpleType name="PositioningServiceType">

<xs:restriction base="xs:string">

<xs:enumeration value="Immediate"></xs:enumeration>

<xs:enumeration value="Periodic"></xs:enumeration>

</xs:restriction>

</xs:simpleType>

<xs:simpleType name="PositioningPeriodicity">

<xs:restriction base="xs:nonNegativeInteger">

</xs:restriction>

</xs:simpleType>

<xs:complexType name="PositioningParameters">

<xs:sequence>

<xs:element name="RequestedLocationType" type="RequestedLocationType" minOccurs="0"></xs:element>

<xs:element name="RequestedResponseType" type="RequestedResponseType" minOccurs="0"></xs:element>

<xs:element name="MaxLocationAge" type="xs:nonNegativeInteger" minOccurs="0"></xs:element>

<xs:element name="ResponseTimingRequired" type="ResponseTimingRequired" minOccurs="0"></xs:element>

<xs:element name="ResponseTimer" type="xs:nonNegativeInteger" minOccurs="0"></xs:element>

<xs:element name="HorizontalAccuracy" type="NumberWithQOSClass" minOccurs="0"></xs:element>

<xs:element name="AltitudeAccuracy" type="NumberWithQOSClass" minOccurs="0"></xs:element>

<xs:element name="MotionStateRequest" type="EmptyElement" minOccurs="0"></xs:element>

</xs:sequence>

</xs:complexType>

<xs:simpleType name="RequestedLocationType">

<xs:restriction base="xs:string">

<xs:enumeration value="CURRENT"></xs:enumeration>

<xs:enumeration value="CURRENT\_OR\_LAST"></xs:enumeration>

</xs:restriction>

</xs:simpleType>

<xs:simpleType name="RequestedResponseType">

<xs:restriction base="xs:string">

<xs:enumeration value="SYNC"></xs:enumeration>

<xs:enumeration value="ASYNC"></xs:enumeration>

</xs:restriction>

</xs:simpleType>

<xs:simpleType name="ResponseTimingRequired">

<xs:restriction base="xs:string">

<xs:enumeration value="NO\_DELAY"></xs:enumeration>

<xs:enumeration value="LOW\_DELAY"></xs:enumeration>

<xs:enumeration value="DELAY\_TOL"></xs:enumeration>

</xs:restriction>

</xs:simpleType>

<xs:complexType name="NumberWithQOSClass">

<xs:simpleContent>

<xs:extension base="xs:nonNegativeInteger">

<xs:attribute name="qos\_class" type="QOSClass"></xs:attribute>

</xs:extension>

</xs:simpleContent>

</xs:complexType>

<xs:simpleType name="QOSClass">

<xs:restriction base="xs:string">

<xs:enumeration value="ASSURED"></xs:enumeration>

<xs:enumeration value="BEST\_EFFORT"></xs:enumeration>

</xs:restriction>

</xs:simpleType>

<xs:simpleType name="EmptyElement">

<xs:restriction base="xs:string">

<xs:enumeration value=""></xs:enumeration>

</xs:restriction>

</xs:simpleType>

<xs:complexType name="LALSLTFProvisioningExtensions">

<xs:sequence>

<xs:element name="LILCSClientAddress" type="LILCSClientIPAddress"></xs:element>

<xs:element name="PositioningParameters" type="PositioningParameters" minOccurs="0"></xs:element>

</xs:sequence>

</xs:complexType>

<xs:complexType name="LILCSClientIPAddress">

<xs:sequence>

<xs:choice>

<xs:element name="IPv4Address" type="IPv4Address"/>

<xs:element name="IPv6Address" type="IPv6Address"/>

</xs:choice>

</xs:sequence>

</xs:complexType>

<xs:simpleType name="IPv4Address">

<xs:restriction base="xs:token">

<xs:pattern value="((25[0-5]|2[0-4][0-9]|[01]?[0-9]?[0-9])\.){3}(25[0-5]|2[0-4][0-9]|[01]?[0-9]?[0-9])"/>

</xs:restriction>

</xs:simpleType>

<xs:simpleType name="IPv6Address">

<xs:restriction base="xs:token">

<xs:pattern value="([0-9a-f]{4}:){7}([0-9a-f]{4})"/>

</xs:restriction>

</xs:simpleType>

<xs:complexType name="PDHRReportingExtensions">

<xs:sequence>

<xs:element name="PDHType" type="PDHType"></xs:element>

</xs:sequence>

</xs:complexType>

<xs:complexType name="PDHType">

<xs:choice>

<xs:element name="PDHR" type="EmptyElement"></xs:element>

<xs:element name="PDSR" type="PDSRParameters"></xs:element>

</xs:choice>

</xs:complexType>

<xs:complexType name="PDSRParameters">

<xs:sequence>

<xs:element name="PDSRTriggerType" type="PDSRTriggerType"></xs:element>

</xs:sequence>

</xs:complexType>

<xs:complexType name="PDSRTriggerType">

<xs:choice>

<xs:element name="TimerExpiry" type="TimerExpiryInSeconds"></xs:element>

<xs:element name="PacketCount" type="xs:nonNegativeInteger"></xs:element>

<xs:element name="ByteCount" type="xs:nonNegativeInteger"></xs:element>

</xs:choice>

</xs:complexType>

<xs:complexType name="SMSFProvisioningExtensions">

<xs:sequence>

<xs:element name="TruncateTPUserData" type="xs:boolean"></xs:element>

</xs:sequence>

</xs:complexType>

<xs:simpleType name="TimerExpiryInSeconds">

<xs:restriction base="xs:nonNegativeInteger">

</xs:restriction>

</xs:simpleType>

</xs:schema>

**\*\*\* End of All MODIFICATIONS \*\*\***