**3GPP TSG-SA3 Meeting #94-LI *s3i240494***

**Amsterdam, Netherlands, 9th Jul 2024 - 12th Jul 2024**

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  | **33.128** | **CR** | **0664** | **rev** | **1** | **Current version:** | **18.8.0** |  |
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| *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:***  | Location acquisition based on measurement reporting |
|  |  |
| ***Source to WG:*** | SA3-LI (PIDS, TNO, OTD\_US, NDRE, Ofcom (CH)) |
| ***Source to TSG:*** | SA3 |
|  |  |
| ***Work item code:*** | LI19 |  | ***Date:*** | 2024-07-11 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-19 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19) Rel-20 (Release 20)* |
|  |  |
| ***Reason for change:*** | Stage 3 implementation for adding the option of E-CID measurements as part of location acquisistion as specified in TS 33.127. |
|  |  |
| ***Summary of change:*** | - LI\_HILA has been enhanced by adding two LDTaskFlags in order to indicate whether location information and/or E-CID measurements are requested. The corresponding response structure is enhanced so that in addition to location information also E-CID measurements information can be returned via the LI\_HILA interface.- LI\_XLA has been enhanced by adding two parameters in the LocationAcquisitionRequest in order to handle the enhancement of the LI\_HILA interface.- Positioning info transfer for 5G and for EPC have been made applicable for use with LARF.- Location acquisition procedure at the LARF has been enhanced with the option for E-CID measurements based on the use of NRRPa protocol for 5G and LPPa protocol for EPC.- LI\_X2\_LA and LI\_HI2 delivery have been enhanced to include responses of the E-CID measurements via xIRI and IRI records, based on the use of positioning info transfer records. |
|  |  |
| ***Consequences if not approved:*** | Additional location related information cannot be used as potential enhancements on the existing location acquisition method. |
|  |  |
| ***Clauses affected:*** | 5.11.2, 5.12.2, 6.2.2.2.4, 6.2.2.2.8, 6.3.2.2.5, 6.3.2.2.8, 7.3.5.4, 7.3.5.5, 7.3.5.6.2, 7.3.5.6.3, M.1.2.7, M.1.2.8, TS33128Dictionaries.xml, urn\_3GPP\_ns\_li\_3GPPLIQueryExtensions.xsd, urn\_3GPP\_ns\_li\_3GPPXLAExtensions.xsd |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS 33.127 CR 241  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** | This CR is associated with the following changes in the Forge:Merge request: [!265](https://forge.3gpp.org/rep/sa3/li/-/merge_requests/265)Commit Hash: [63b675b78255c18f16b873381b854df98eb86c42](https://forge.3gpp.org/rep/sa3/li/-/commit/63b675b78255c18f16b873381b854df98eb86c42)  |
|  |  |
| ***This CR's revision history:*** | s3i240435 |

FIRST CHANGE

### 5.11.2 Usage for realising LI\_HILA

#### 5.11.2.1 Request structure

LI\_HILA requests are represented by issuing a CREATE request for an LDTaskObject (see ETSI TS 103 120 [6] clause 8.3), populated as follows:

Table 5.11.2.1-1: LDTaskObject representation of LI\_HILA request

|  |  |  |
| --- | --- | --- |
| Field | Value | M/C/O |
| Reference | The LDID (as in ETSI TS 103 280 [97] with country code, unique LEA identifier, and the LIID used in the warrant as unique request identifier. | M |
| DesiredStatus | Shall be set to "AwaitingDisclosure". | M |
| RequestDetails | Set according to table 5.11.2.1-2 below. | M |
| DeliveryDetails | Shall be set to indicate the delivery destination for the LI\_HILA records (see clause 5.11.2.3 and ETSI TS 103 120 [6] clause 8.3.6.2) unless the delivery destination is known via other means. | C |

The use of any other LDTaskObject parameter is outside the scope of the present document.

Table 5.11.2.1-2: RequestDetails structure

|  |  |  |
| --- | --- | --- |
| Field | Value | M/C/O |
| Type | Shall be set to one of the HILARequestType values as defined in table 5.11.2.1-3. | M |
| RequestValues | Set to the target identifier (see clause 5.11.2.2). It may include additional flags (see clause 5.11.2.2). | M |

Table 5.11.2.1-3: RequestType Dictionary for LI\_HILA

|  |  |
| --- | --- |
| Dictionary Owner | Dictionary Name |
| 3GPP | RequestType |
|  |  |
| Defined DictionaryEntries |
| Value | Meaning |
| LocationAcquisition | A request for location acquisition information of the target.  |

#### 5.11.2.2 Request parameters

The RequestValues field shall contain at least one of the following:

- IMSI, given in the IMSI format as defined in ETSI TS 103 120 [6] clause C.2.

- MSISDN, given in the E.164 format as defined in ETSI TS 103 120 [6] clause C.2.

- SUPI, given in either SUPIIMSI or SUPINAI formats as defined in ETSI TS 103 120 [6] clause C.2.

- GPSI, given in either GPSIMSISDN or GPSINAI formats as defined in ETSI TS 103 120 [6] clause C.2.

The LDTaskObject for a location acquisition request may also contain the "LocationInformation" LDTaskFlag (see table 5.11.2.2-1). If the flag is present, the LAF shall set the LocationInformation parameter in the LI\_XLA request sent to the LARF to true. If this flag is absent, the LAF shall either set the LocationInformation parameter in the LI\_XLA request sent to the LARF to false or not include this parameter.

The LDTaskObject for a location acquisition request may also contain the "ReqCurrentLoc" LDTask flag (see table 5.11.2.2-1). If this flag is present, the LAF shall set the ReqCurrentLoc parameter in the LI\_XLA request sent to the LARF to true. If this flag is absent, the LAF shall either set the ReqCurrentLoc parameter in the LI\_XLA request sent to the LARF to false or not include this parameter.

The LDTaskObject for a location acquisition request may also contain the "ECIDMeasurements" LDTaskFlag (see table 5.11.2.2-1). If the flag is present, the LAF shall set the ECIDMeasurements parameter in the LI\_XLA request sent to the LARF to true. If this flag is absent, the LAF shall either set the ECIDMeasurements parameter in the LI\_XLA request sent to the LARF to false or not include this parameter.

Table 5.11.2.2-1: LDTaskFlags for LI\_HILA Requests

|  |  |
| --- | --- |
| Dictionary Owner | Dictionary Name |
| 3GPP | LIHILAFlags |
| Defined DictionaryEntries |
| Value | Meaning |
| LocationInformation | Indicates whether location information of the UE is requested. |
| ReqCurrentLoc | Indicates whether the current location of the UE is requested in case location information of the UE is requested.NOTE: If the flag NetworkProvidedLocation is absent, the presence or absence of the flag ReqCurrentLoc has no relevance. |
| ECIDMeasurements | Indicates whether E-CID measurements of the UE are requested. |

#### 5.11.2.3 Response structure

For the location information requests, if delivery via the LI\_HI2 is required, the LARF will send the response as either an AMFLocationUpdate (in case of the 5GC) or an MMELocationUpdate (in case of the EPC) xIRI record to the MDF2 via LI\_X2\_LA. Full details are given in clause 7.3.5.6. For E-CID measurements requests, if delivery via the LI-HI2 is required, the LARF will send the response as either an AMFPositioningInfoTransfer (in case of 5GC) or an MMEPositioningInfoTransfer (in case of the EPC) xIRI record via the MDF2 via LI\_X2\_LA. Full details are given in clause 7.3.5.6.

If delivery via the LI\_HILA is required, the LARF returns the location acquisition response as part of the LI\_XLA response, which the LAF then transforms into a LI\_HILA response given as a LocationResponseDetails structure (see table 5.11.2.3-1). Full details are given in clause 7.3.5. LocationResponseDetails contains LocationOutcome records and/or ECIDMeasurementsOutcome records.

The fields of the LocationResponseDetails structure shall be set as follows:

Table 5.11.2.3-1: LocationResponseDetails

|  |  |  |
| --- | --- | --- |
| Field | Description/Value | M/C/O |
| LocationOutcomes | Location information of the target or failure cases if determined by the 5GS. When present, shall be populated with a sequence of LocationOutcome structures (see table 5.11.2.3-2).  | C |
| EPCLocationOutcomes | Location information of the target or failure cases if determined by the EPS. When present, shall be populated with a sequence of EPCLocationOutcome structures (see table 5.11.2.3-3). | C |
| ECIDMeasurementsOutcomes | E-CID measurements information of the target if determined by the 5GS, or failure causes. If present, shall be populated with a sequence of ECIDMeasurementOutcome structures (see table 5.11.2.3-4). | C |
| EPCECIDMeasurementsOutcomes | E-CID measurements information of the target if determined by the EPS, or failure causes. If present, shall be present with a sequence of EPCECIDMeasurementOutcome structures (see table 5.11.2.3-5). | C |

NOTE: The LocationOutcomes/ EPCLocationOutcomes and the ECIDMeasurementsOutcomes/ EPCECIDMeasurementsOutcomes should be handled as separate information and should not be combined, in order to avoid misinterpretation.

Table 5.11.2.3-2: LocationOutcome

|  |  |  |
| --- | --- | --- |
| Field | Description/Value | M/C/O |
| SUPI | SUPI associated with the UE for which location is returned. | M |
| GPSI | GPSI associated with the UE for which location is returned. Shall be included if the GPSI of the UE for which location is returned is known. | C |
| Location | Location of the target if determined by the network.- It shall include a JSON ProvideLocInfo structure as defined in TS 29.518 [22] clause 6.4.6.2.6, in base-64 encoding, in case the location could be determined. | C |
| FailureCause | If the location acquisition procedure fails, this parameter shall be included.The values for this parameter shall be derived from values of the failure response received from the AMF.- If a ProblemDetails structure is returned, the errorDetails field shall be populated with a JSON ProblemDetails structure as defined in TS 29.571 [17] clause 5.2.4.1 in base-64 encoding. | C |

Table 5.11.2.3-3: EPCLocationOutcome

|  |  |  |
| --- | --- | --- |
| Field | Description/Value | M/C/O |
| IMSI | IMSI associated with the UE for which location is returned. | M |
| MSISDNs | List of MSISDNs associated with the UE for which location is returned, if available. | C |
| Location | Location of the target if determined by the network.It shall include the MME-Location-Information AVP as defined in TS 29.272 [108] clause 7.3.115, in base-64 encoding, in case the location could be determined. | C |
| FailureCause | If the location acquisition procedure fails, this parameter shall be included.The value of this parameter shall be set to the Result-Code as returned from the MME.  | C |

Table 5.11.2.3-4: ECIDMeasurementsOutcome

|  |  |  |
| --- | --- | --- |
| Field | Description/Value | M/C/O |
| SUPI | SUPI associated with the UE for which measurement information is returned. | M |
| GPSI | GPSI associated with the UE for which measurement information is returned. Shall be included if the GPSI of the UE for which measurement information is returned is known. | C |
| ECIDMeasurements | E-CID measurements information of the target if determined by the network.Shall be present when the NG-RAN node was able to initiate the requested E-CID measurement. Shall include an ExternalASNType structure populated with the contents of the PER encoded contents of the E-CID MEASUREMENT INITIATION RESPONSE IE defined in TS 38.455 [86] clause 9.1.1.2. | C |
| FailureCause | Shall be present if the NG-RAN node was not able to initiate at least one of the requested E-CID measurements. Shall include an ExternalASNType structure populated with the contents of the PER encoded contents of the E-CID MEASUREMENT INITIATION FAILURE IE defined in TS 38.455 [86] clause 9.1.1.3. | C |

The *ExternalASNType.encodedASNValue.alignedPER* choice shall be used when populating this type and it shall be populated with the contents of the Trace Activation IE defined in TS 38.413 [23] clause 9.3.1.14.

Table 5.11.2.3-5: EPCECIDMeasurementsOutcome

|  |  |  |
| --- | --- | --- |
| Field | Description/Value | M/C/O |
| IMSI | IMSI associated with the UE for which measurement information is returned. | M |
| MSISDN | List of MSISDNs associated with the UE for which measurement information is returned, if available. | C |
| ECIDMeasurements | E-CID measurements information of the target if determined by the network.Shall be present when the EUTRAN node was able to initiate the requested E-CID measurement. Shall include an ExternalASNType structure populated with the contents of the PER encoded contents of the E-CID MEASUREMENT INITIATION RESPONSE IE defined in TS 36.455 [84] clause 9.1.1.2. | C |
| FailureCause | Shall be included if the EUTRAN node was not able to initiate at least one of the requested E-CID measurements.Shall include an ExternalASNType structure populated with the contents of the PER encoded contents of the E-CID MEASUREMENT INITIATION FAILURE IE defined in TS 36.455 [84] clause 9.1.1.3. | C |

Responses are delivered within a DELIVER Request (see ETSI TS 103 120 [6] clause 6.4.10) containing a DeliveryObject (see ETSI TS 103 120 [6] clause 10).

The DeliveryObject Reference field (see ETSI TS 103 120 [6] clause 10.2.1) shall be set to the Reference of the LDTaskObject used in the request to provide a correlation between request and response. The DeliveryID, SequenceNumber, and LastSequence fields shall be set according to ETSI TS 103 120 [6] clause 10.2.1.

The content manifest (see ETSI TS 103 120 [6] clause 10.2.2) shall be set to indicate the present document and the type of response using the following Specification Dictionary extension.

Table 5.11.2.3-6: Specification Dictionary

|  |  |
| --- | --- |
| Dictionary Owner | Dictionary Name |
| 3GPP | ManifestSpecification |
| Defined DictionaryEntries |
| Value | Meaning |
| HILAResponse | The delivery contains a LocationResponseDetails (see Annex I) |

NEXT CHANGE

### 5.12.2 Usage for realising LI\_XLA

LI\_XLA requests are realised using ETSI TS 103 221-1 [7] to transport the LocationAcquisitionRequest and LocationAcquisitionResponse messages (which are derived from X1RequestMessage and X1ResponseMessage respectively, as defined in ETSI TS 103 221-1 [7]), see Annex I. The LocationAcquisitionRequest message is populated as follows:

Table 5.12.2-1: LocationAcquisitionRequest representation for an XLA request

|  |  |  |
| --- | --- | --- |
| Field | Description | M/C/O |
| RequestValues | Set to the target identifier specified in the LI\_HILA request (see clause 5.11.2). | M |
| LocationInformation | Based on the information received over the LI\_HILA interface (see clause 5.11.2.2).Indicates whether location information of the UE is requested.If set to true, the LARF shall perform the location information procedure as specified in clause 7.3.5.4.2 and clause 7.3.5.4.3.If set to false or absent, the LARF shall not perform the location information procedure.This parameter shall be set to true if the request received over LI\_HILA had the LocationInformation flag set, and shall be set to false or be absent if the request received over LI\_HILA did not have the LocationInformation flag. | C |
| ReqCurrentLoc | Indicates whether the current location of the UE is requested in case the location information procedure is performed.The effect of this parameter is as described in clause 7.3.5.4.2 and clause 7.3.5.4.3.This parameter shall be set to true if the request received over LI\_HILA had the ReqCurrentLoc flag set and shall be set to false or be absent if the request received over LI\_HILA did not have the ReqCurrentLoc flag. | C |
| ECIDMeasurements | Based on the information received over the LI\_HILA interface (see clause 5.11.2.2).Indicates whether E-CID measurements of the UE are requested.If set to true, the LARF shall perform the E-CID measurements procedure as specified in clause 7.3.5.4.2 and clause 7.3.5.4.3.If set to false or absent, the LARF shall not perform the E-CID measurements procedure.This parameter shall be set to true if the request received over LI\_HILA had the ECIDMeasurements flag set, and shall be set to false or be absent if the request received over LI\_HILA did not have the ECIDMeasurements flag. | C |
| HILADelivery | Based on the information received over the LI\_HI1 interface (see 5.4.3). If set, the LARF shall return the location information to the LAF (see NOTE). | C |
| HI2Delivery  | Based on the information received from the LI\_HI1 interface (see 5.4.3). If present, the format shall be as defined in table 5.12.2-2 (see NOTE). | C |
| NOTE: At least one delivery method is required. |

Table 5.12.2-2: HI2Delivery structure

|  |  |  |
| --- | --- | --- |
| Field | Description | M/C/O |
| XID | The value shall be used by the LARF to fill the XID field of the X2 PDUs. The value shall be the same as the one provisioned on the MDF2 (see clause 7.3.5.6.2). | C |
| ListOfDestinations | Delivery endpoints for LI\_X2\_LA for the LARF in the MME/AMF. This field shall be present unless the delivery details are known via other means. | C |

Successful LI\_XLA responses are returned using the LocationAcquisitionResponse message. Error conditions are reported using the normal error reporting mechanisms described in ETSI TS 103 221-1 [7]. LI\_XLA query responses are represented in XML following the LocationAcquisitionResponse schema (see Annex I). If delivery via the LI\_HILA was specified, the fields of the LocationAcquisitionResponse record shall be populated as described in clause 5.11.2.3. If delivery via the LI\_HI2 was specified in the original request, the LARF shall leave the LocationAcquisitionResponse record field unpopulated.

NEXT CHANGE

##### 6.2.2.2.4 Location update

The IRI-POI in the AMF shall generate an xIRI containing an AMFLocationUpdate record each time the IRI-POI present in an AMF detects that the target’s UE location is updated due to target UE mobility or as a part of an AMF service procedure and the reporting of location information is not restricted by service scoping. The generation of such separate xIRI is not required if the updated UE location information is obtained as a part of a procedure producing some other xIRIs (e.g. mobility registration). In that case the location information is included into the respective xIRI.

The UE mobility events resulting in generation of an AMFLocationUpdate xIRI include the *N2 Path Switch Request* (*Xn based inter NG-RAN handover* procedure described in TS 23.502 [4] clause 4.9.1.2) and the *N2 Handover Notify* (*Inter NG-RAN node N2 based handover* procedure described in TS 23.502 [4] clause 4.9.1.3).

The AMFLocationUpdate xIRI is also generated when the AMF receives an NG-RAN NGAP *PDU Session Resource Modify Indication* message as a result of Dual Connectivity activation/release for the target UE, as described in TS 37.340 [37] clause 10.

Optionally, based on operator policy, other NG-RAN NGAP messages that do not generate separate xIRI but carry location information (e.g. RRC INACTIVE TRANSITION REPORT) may trigger the generation of an xIRI AMFLocationUpdate record.

Additionally, based on regulatory requirements and operator policy, the location information obtained by AMF from NG-RAN or LMF in the course of some service operation (e.g. emergency services, LCS) may generate xIRI AMFLocationUpdate record. The AMF services providing the location information in these cases include the AMF Location Service (ProvideLocInfo, ProvidePosInfo, NotifiedPosInfo and EventNotify service operations) and the AMF Exposure Service (AmfEventReport with LOCATION\_REPORT) (see TS 29.518 [22]). Additionally, the AMF Communication Service (Namf\_Communication\_N1MessageNotify service operation) may be monitored to capture the location information in the scenarios described in TS 23.273 [42] clause 6.3.1. Also, in the case of Mobile Originated LCS service invoked by the target, the location information may be derived from a Nlmf\_Location\_DetermineLocation Response to AMF (see TS 23.273 [42] clause 6.2).

The AMFLocationUpdate record is also used by LARF to deliver location information responses to MDF2, as described in clause 7.3.5.6. The IRI-POI in the AMF shall not generate the AMFLocationUpdate xIRI when the location information is acquired as the result of a LARF request, as described in TS 33.127 [5], clause 7.3.5.2.

Table 6.2.2.2.4-1: Payload for AMFLocationUpdate record

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| sUPI | SUPI | 1 | SUPI associated with the location update (see clause 6.2.2.4). | M |
| sUCI | SUCI | 0..1 | SUCI associated with the location update, if available, see TS 24.501 [13]. | C |
| pEI | PEI | 0..1 | PEI associated with the location update, if available. | C |
| gPSI | GPSI | 0..1 | GPSI associated with the location update, if available as part of the subscription profile. | C |
| gUTI | FiveGGUTI | 0..1 | 5G-GUTI associated with the location update, if available, see TS 24.501 [13]. | C |
| location | Location | 1 | Updated location information determined by the network.Depending on the service or message type from which the location information is extracted, it may be encoded in several forms:1) as a *Location.locationInfo.userLocation* parameter in the case the information is obtained from an NGAP message, except the LOCATION REPORT message (see TS 38.413 [23]);2) as a *Location.locationInfo* in the case the information is obtained from a **ProvideLocInfo** (TS 29.518 [22] clause 6.4.6.2.6);3) as a *Location.locationPresenceReport* parameter in the case the information is obtained from an **AmfEventReport** (TS 29.518 [22] clause 6.2.6.2.5) with event type **Location-Report** or **Presence-In-AOI-Report;**4) as a *Location.positioningInfo.positionInfo parameter* in the case the information is obtained from a **ProvidePosInfo** (TS 29.518 [22] clause 6.4.6.2.3) or a **NotifiedPosInfo** (TS 29.518 [22] clause 6.4.6.2.4).If available, other parameters reportable via *Location* shall be included. | M |
| deprecatedSMSoverNASIndicator | SMSOverNASIndicator | 0..1 | No longer used in present version of this specification. | C |
| deprecatedOldGUTI | EPS5GGUTI | 0..1 | No longer used in present version of this specification. | C |
| uEAreaIndication | UEAreaIndication | 0..1 | Contains a country, area in a country or international area indication where UE is located, if available. If UE is outside of the area of any known country, i.e. international area, it contains the international area indication without a country. See table 6.2.2.2.2-2 for details on this data type. | C |

NEXT CHANGE

##### 6.2.2.2.8 Positioning info transfer

The IRI-POI present in the AMF shall generate an xIRI containing an AMFPositioningInfoTransfer when the IRI-POI present in the AMF detects one of the following events:

- an NRPPa (see TS 38.455 [86]) message related to a target UE has been exchanged between the LMF and NG-RAN via the AMF.

- a LPP (see TS 37.355 [85]) message related to a target UE has been exchanged between the LMF and the target UE via the AMF.

Accordingly, the IRI-POI in AMF generates the xIRI when any of the following events is detected:

- AMF receives an Namf\_Communication\_N1N2MessageTransfer (see TS 29.518 [22]) from LMF to request the transfer of a NRPPa request to the serving NG-RAN node for a target UE as part of a UE associated NRPPa positioning activity. The NRPPa request may be E-CID MEASUREMENT INITIATION REQUEST or OTDOA INFORMATION REQUEST.

- AMF sends a Namf\_Communication\_N2InfoNotify (see TS 29.518 [22]) to the LMF to forward the NRPPa response or report received from the NG-RAN for a target UE. The NRPPa response or report may be E-CID MEASUREMENT INITIATION RESPONSE, E-CID MEASUREMENT REPORT or OTDOA INFORMATION RESPONSE.

- AMF receives an Namf\_Communication\_N1N2MessageTransfer (see TS 29.518 [22]) from LMF to request the transfer of a LPP message to a target UE as part of a LPP positioning activity.

- AMF sends an Namf\_Communication\_N1MessageNotify (see TS 29.518 [22]) to LMF to forward a LPP message received from the target UE.

The AMFPositioningInfoTransfer record is also used by LARF to deliver E-CID measurements responses to MDF2, as described in clause 7.3.5.6. The IRI-POI in the AMF shall not generate the AMFPositioningInfoTransfer xIRI when the E-CID measurement response is received as the result of a LARF request, as described in TS 33.127 [5], clause 7.3.5.2.

Table 6.2.2.2.8-1: Payload for AMFPositioningInfoTransfer record

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| sUPI | SUPI | 1 | SUPI associated with the procedure (see NOTE 1 in table 6.2.2.2.7-1). | M |
| sUCI | SUCI | 0..1 | SUCI used in the procedure, if applicable and if available. | C |
| pEI | PEI | 0..1 | PEI used in the procedure, if available (see NOTE 1 in table 6.2.2.2.7-1). | C |
| gPSI | GPSI | 0..1 | GPSI used in the procedure, if available (see NOTE 1 in table 6.2.2.2.7-1). | C |
| gUTI | FiveGGUTI | 0..1 | 5G-GUTI used in the procedure, see TS 24.501 [13] clause 9.11.3.4. | C |
| nRPPaMessage | OCTET STRING | 0..1 | Any UE associated NRPPa message exchanged between the LMF and NG-RAN via AMF. | C |
| lPPMessage | OCTET STRING | 0..1 | Any LPP message exchanged between the LMF and the target UE via AMF. | C |
| lcsCorrelationId | UTF8String (SIZE(1..255)) | 1 | LCS correlation ID (see TS 29.572 [24] clause 6.1.6.3.2) related to a location session, found in the Namf\_CommunicationN1N2MessageTransfer and corresponding Namf\_Communication\_N2InfoNotify or Namf\_CommunicationN1MessageNotify. All the AMFPositioningInfoTransfer records related to the same location session have the same lcsCorrelationId. (see NOTE) | M |
| NOTE: In case the AMFPositioningInfoTransfer record is created as a result of a LARF request, the LCS Correlation ID shall be created by the LARF, as part of the E-CID measurement procedure, in order to link the request to the response. |

NEXT CHANGE

##### 6.3.2.2.5 Tracking Area/EPS Location update

When the reporting of location information is authorised, the IRI-POI in the MME shall generate an xIRI containing an MMELocationUpdate record each time the IRI-POI present in an MME detects that the target UE location is updated due to target UE mobility or as a part of an MME service procedure. The generation of such separate xIRI is not required if the updated UE location information is obtained as a part of a procedure producing some other xIRIs (e.g. mobility registration). In that case the location information is included into the respective xIRI.

In addition to the Tracking Area Update described in TS 23.401 [50], clause 5.3.3, the UE mobility events resulting in generation of an MMELocationUpdate xIRI include the *S1 Path Switch Request* (*intra E-UTRAN handover* *X2 based handover* procedure described in TS 23.401 [50] clause 5.5.1.1) and the *S1 Handover Notify* (*Intra E-UTRAN S1 based handover* procedure described in TS 23.401 [50] clause 5.5.1.2).

The MMELocationUpdate xIRI is also generated when the MME receives an E-UTRAN S1AP *ERAB Modification Indication* message as a result of Dual Connectivity activation/release for the target UE, as described in TS 37.340 [37] clause 10.

Based on regulatory requirements and operator policy, the location information obtained by the MME from E-UTRAN or the E-SMLC in the course of some service operations may result in the generation of the MMELocationUpdate xIRI record. Additionally, the IRI-POI in the MME shall capture the location information in the scenarios described in TS 23.271 [52] clause 4.4.2. Also, in the case of Mobile Originated LCS service invoked by the target, the location information may be derived from the Location Service Response sent to the target UE via the MME (see TS 23.271 [52] clause 9.2.6).

Optionally, based on regulatory and operator policy, other MME messages that do not generate separate xIRI but carry location information such as emergency services or LCS may trigger the generation of an MMELocationUpdate xIRI record.

The MMELocationUpdate record is also used by LARF to deliver location information responses to MDF2, as described in clause 7.3.5.6. For the responses to location information requests initiated by LARF, as described in TS 33.127 [5] the MMELocationUpdate xIRIs shall not be generated.

Table 6.3.2-5: Payload for MMELocationUpdate record

|  |  |  |
| --- | --- | --- |
| Field name | Description | M/C/O |
| iMSI | iMSI associated with the location update. | M |
| iMEI | iMEI associated with the location update, if available. | C |
| mSISDN | mSISDN associated with the location update, if available as part of the subscription profile. | C |
| gUTI | GUTI assigned during the location update, if available, see TS 24.301 [50]. | C |
| Location | Updated location information determined by the network. Depending on the service or message type from which the location information is extracted, it may be encoded in several forms (Annex A). | M |
| oldGUTI | GUTI used to initiate the location update, if available, see TS 24.301 [50]. | C |
| sMSServiceStatus | Indicates the availability of SMS Services. Shall be provided if present in the TRACKING AREA UPDATE ACCEPT. | C |

NEXT CHANGE

##### 6.3.2.2.8 Positioning info transfer

The IRI-POI present in the MME shall generate an xIRI containing an MMEPositioningInfoTransfer when the IRI-POI present in the MME detects one of the following events:

- a LPPa (see TS 36.455 [84]) message related to a target UE has been exchanged between the E-SMLC and the eNB via the MME.

- a LPP (see TS 37.355 [85]) message related to a target UE has been exchanged between the E-SMLC and the target UE via the MME.

Accordingly, the IRI-POI in MME generates the xIRI when any of the following events is detected:

- MME receives an SLs CONNECTION ORIENTED INFORMATION message (see TS 29.171 [54]) from E-SMLC to request the transfer of a LPPa request to the serving eNB for a target UE as part of a UE associated LPPa positioning activity. The LPPa request may be E-CID MEASUREMENT INITIATION REQUEST or OTDOA INFORMATION REQUEST.

- MME sends an SLs CONNECTION ORIENTED INFORMATION message (see TS 29.171 [54]) to the E-SMLC to forward the LPPa response or report received from the eNB for a target UE. The LPPa response or report may be E-CID MEASUREMENT INITIATION RESPONSE, E-CID MEASUREMENT REPORT or OTDOA INFORMATION RESPONSE.

- MME receives an SLs CONNECTION ORIENTED INFORMATION message (see TS 29.171 [54]) from E-SMLC to request the transfer of a LPP request to the target UE.

- MME sends an SLs CONNECTION ORIENTED INFORMATION message (see TS 29.171 [54]) to E-SMLC to forward a LPP message received from the target UE.

The MMEPositioningInfoTransfer record is also used by LARF to deliver E-CID measurements responses to MDF2, as described in clause 7.3.5.6. The IRI-POI in the AMF shall not generate the MMEPositioningInfoTransfer xIRI when the E-CID measurement response is received as the result of a LARF request, as described in TS 33.127 [5], clause 7.3.5.2.

Table 6.3.2-7A: Payload for MMEPositioningInfoTransfer record

|  |  |  |
| --- | --- | --- |
| Field name | Description | M/C/O |
| iMSI | IMSI associated with the location update. | M |
| iMEI | IMEI associated with the location update, if available. | C |
| mSISDN | MSISDN associated with the location update, if available as part of the subscription profile. | C |
| gUTI | GUTI assigned during the location update, if available, see TS 24.301 [50]. | C |
| lPPaMessage | Any UE associated LPPa message exchanged between the LMF and eNB via MME. | C |
| lPPMessage | Any LPP message exchanged between the E-SMLC and the target UE via MME. | C |
| mMELCSCorrelationId | MMELCSCorrelationId is made of Correlation Id, described in clause 7.4.28 of TS 29.171 [54], related to a location session, found in the SLs CONNECTION ORIENTED INFORMATION sent by E-SMLC to MME and corresponding SLs CONNECTION ORIENTED INFORMATION sent by MME to E-SMLC. All the MMEPositioningInfoTransfer records related to the same location session have the same CorrelationId. (see NOTE) | M |
| NOTE: In case the MMEPositioningInfoTransfer record is created as a result of a LARF request, the MMELCSCorrelationId shall be created by the LARF, as part of the E-CID measurement procedure, in order to link the request to the response. |

NEXT CHANGE

#### 7.3.5.4 Location acquisition procedure at the LARF

##### 7.3.5.4.1 General description

Upon the receipt of a location acquisition request over LI\_XLA, the LARF shall first check that the UE is registered at the MME/AMF. If it is registered the LARF will check the UE context at the MME/AMF to see if the current location for the UE is known.

The LARF/MME/AMF shall override any user consent, privacy and paging restrictions concerned with location acquisition that may apply to the target UE. The LARF/MME/AMF shall ensure that overriding these restrictions does not result in additional detectability issues.

If delivery via the LI\_HI2 is required, the LARF will send the response to the location information request as either an AMFLocationUpdate (in case of the 5GC) or an MMELocationUpdate (in case of the EPC) xIRI record to the MDF2 via LI\_X2\_LA. Full details are given in clause 7.3.5.6. If delivery via the LI\_HI2 is required, the LARF will send the response to the E-CID measurements request as either an AMFPositioningTransfer (in case of the 5GC) or an MMEPositioningTransfer (in case of the EPC) xIRI record to the MDF2 via LI\_X2\_LA. Full details are given in clause 7.3.5.6.

If delivery via the LI\_HILA is required, the LARF returns the location acquisition response as part of the LI\_XLA response, which the LAF then transforms into a LI\_HILA response given as a LocationResponseDetails structure (see table 5.11.2.3-1). Full details are given in clause 7.3.5.5 and clause 5.11.2.3.

NOTE: The following clauses describe a possible implementation of the LARF to exchange communication with the RAN. Other implementations are not excluded that result in the same message exchange between the LARF and the RAN.

##### 7.3.5.4.2 Location acquisition procedure at the LARF in case of EPC

If the LocationInformation parameter (see table 5.12.2-1) is present and set to true, the location information procedure shall be performed as follows:

- If the ReqCurrentLoc parameter (see table 5.12.2-1) is set to true in the location acquisition request message received over LI\_XLA, the LARF shall emulate the invocation of the Insert Subscriber Data procedure, with the IDR-Flags with the "EPS Location Information Request" bit and the "Current Location Request" bit set (TS 29.272 [108] clause 5.2.2.1.2) using the information received in the location acquisition request message.

- If the ReqCurrentLoc parameter (see table 5.12.2-1) is set to false or absent in the location acquisition request message received over LI\_XLA, the LARF shall use the location information in the UE context at the MME to generate and deliver a location acquisition response based on the provisioned delivery method as described in clauses 7.3.5.5 and 7.3.5.6.

If the LocationInformation parameter (see table 5.12.2-1) is absent or set to false, the location information procedure shall not be performed.

If the ECIDMeasurements parameter (see table 5.12.2-1) is present and set to true, the E-CID measurements procedure shall be performed as follows:

- After receiving an E-CID measurements request message over LI\_XLA, the LARF shall emulate the reception of a CONNECTION ORIENTED INFORMATION message by the MME (see TS 29.171 [54], clause 6.2.2.1.2) in order to transfer an LPPa APDU to the E-UTRAN through the MME as a Location Information message in the network assisted positioning procedure (see TS 23.271 [52], clause 9.3a.2).

- The LPPa APDU included in the emulated message shall be an E-CID MEASUREMENT INITIATION REQUEST (see TS 36.455 [84], clause 9.1.1.1) where the IEs are populated as follows:

- LPPa Transaction ID: a value conforming to the LPPa protocol as specified in TS 36.455 [84]; the actual value is left for implementation.

- E-SMLC Measurement ID: a value conforming to the LPPa protocol as specified in TS 36.455 [84]; the actual value is left for implementation.

- Report Characteristics: OnDemand.

- A list of Measurement Quantities Item IEs, for every available value of this IE.

- After having received the LPPa response message from the E-UTRAN, the MME shall pass the message to the LARF. The received LPPa message is either an E-CID MEASUREMENT INITIATION RESPONSE in case of success, or an E-CID MEASUREMENT INITIATION FAILURE, in case of failure.

If the ECIDMeasurements parameter (see table 5.12.2-1) is absent or set to false, the E-CID measurements procedure shall not be performed.

##### 7.3.5.4.3 Location acquisition procedure at the LARF in case of 5GC

If the LocationInformation parameter (see table 5.12.2-1) is present and set to true, the location information procedure shall be performed as follows:

- If the ReqCurrentLoc parameter (see table 5.12.2-1) is set to true in the location acquisition request message received over LI\_XLA, the LARF shall emulate the invocation of a ProvideLocationInfo service operation in the AMF (see TS 29.518 [22] clause 5.5.2.4) using the information received in the location acquisition request message to generate the RequestLocInfo parameters. The LARF shall set the reqCurrentLoc parameter of the RequestLocInfo IE to true (see TS 29.518 [22] clause 5.5.2.4).

- If the ReqCurrentLoc parameter (see table 5.12.2-1) is set to false or absent in the location acquisition request message received over LI\_XLA, the LARF shall use the location information in the UE context at the AMF to generate and deliver a location acquisition response based on the provisioned delivery method as described in clauses 7.3.5.5 and 7.3.5.6.

If the LocationInformation parameter (see table 5.12.2-1) is absent or set to false, the location information procedure shall not be performed.

If the ECIDMeasurements parameter (see table 5.12.2-1) is present and set to true, the E-CID measurements procedure shall be performed as follows:

- After receiving an E-CID measurements request message over LI\_XLA, the LARF shall emulate the invocation of an N1N2MessageTransfer service operation in the AMF (see TS 29.518 [22], clause 5.2.2.3.1) in order to transfer N2 information to the 5G RAN through the AMF for the procedure network assisted positioning (see TS 23.273 [42], clause 6.11.2).

- The emulated N1N2MessageTransfer request shall include an N2 Information Container containing an NRPPa message. The NRPPa message included shall be an E-CID MEASUREMENT INITIATION REQUEST (see TS 38.455 [86], clause 9.1.1.1) where the IEs are populated as follows:

- NRPPa Transaction ID: a value conforming to the NRPPa protocol as specified in TS 38.455 [86]; the actual value is left for implementation.

- LMF UE Measurement ID: a value conforming to the NRPPa protocol as specified in TS 38.455 [86]; the actual value is left for implementation.

- Report Characteristics: OnDemand.

- A list of Measurement Quantities Value IEs, for every available value of this IE.

- After having received the NRPPa response message from the NG-RAN, the AMF shall pass the received message to LARF. The received NRPPa message is either an E-CID MEASUREMENT INITIATION RESPONSE in case of success, or an E-CID MEASUREMENT INITIATION FAILURE, in case of failure.

If the ECIDMeasurements parameter (see table 5.12.2-1) is absent or set to false, the E-CID measurements procedure shall not be performed.

NEXT CHANGE

#### 7.3.5.5 Location acquisition delivery via the LI\_HILA

##### 7.3.5.5.1 Location acquisition response over LI\_XLA

The LARF shall populate the LocationResponseDetails fields in the LocationAcquisitionResponse message as specified in clause 5.11.2.3.

##### 7.3.5.5.2 Location acquisition response over LI\_HILA

On receiving a LocationAcquisitionResponse message containing LocationResponseDetails fields, the LAF shall return the results to the LEA over the LI\_HILA interface. The LI\_HILA response is represented as XML following the LocationResponseDetails type definition (see Annex I) as described in clause 5.11.2.3.

Table 7.3.5.5.2-1: Void

NEXT CHANGE

##### 7.3.5.6.2 LI\_X2\_LA delivery

For delivery of location information, the LARF shall generate the MMELocationUpdate xIRI in case of the EPC or the AMFLocationUpdate xIRI in case of the 5GC only when it detects that MME/AMF returns the location for the corresponding LARF transaction. For the delivery of E-CID measurements, the LARF shall generate the MMEPositioningInfoTransfer xIRI in case of the EPC or the AMFPositioningInfoTransfer xIRI in case of the 5GC only when it detects that MME/AMF returns the measurements for the corresponding LARF transaction.

In case of the 5GC, the location information response shall be given as a AMFLocationUpdate xIRI record. In case of the EPC, the location information response shall be given as an MMELocationUpdate xIRI record. In case of the 5GC, the E-CID measurements response shall be given as a AMFPositioningInfoTransfer xIRI record. In case of the EPC, the E-CID measurements response shall be given as an MMEPositioningInfoTransfer xIRI record. The XID of the xIRI record shall be set to the XID specified in the original request (see clause 5.12.2).

##### 7.3.5.6.3 LI\_HI2 delivery

For a location information response, the MDF2 shall generate the IRI message based on the MMELocationUpdate xIRI record from the LARF in case of EPC or the AMFLocationUpdate xIRI record from the LARF in case of 5GC and deliver it to the LEMF over LI\_HI2. For an E-CID measurements response, the MDF2 shall generate the IRI message based on the MMEPositioningInfoTransfer xIRI record from the LARF in case of EPC and the AMFPositioningInfoTransfer xIRI record from the LARF in case of 5GC and deliver it to the LEMF over LI\_HI2.

NEXT CHANGE

### M.1.2.7 Type: ExternalASNType

Table M.1.2.7-1: Structure of the ExternalASNType ASN.1 type

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| moduleIdentifier | OBJECT IDENTIFIER | 1 | Shall be populated with the Object Identifier of the ASN.1 module used to encode the parameter or message reported in the EncodedASNValue. | M |
| aSNReference | ExternalASNReference | 0..1 | The formal reference notation (as described in clause D.5) for the ASN.1 component used to encode the parameter or message reported in the EncodedASNValue. Shall be present if the OBJECT IDENTIFIER is insufficient to unambiguously decode the EncodedASNValue. | C |
| encodedASNValue | ExternalASNValue | 1 | The contents of the encoded message or parameter being reported. | M |

Table M.1.2.7-2: XSD Structure of the ExternalASNType XSD type

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Element name | Type | Cardinality | Description | M/C/O |
| ModuleIdentifier | ASN1OID | 1 | Shall be populated with the Object Identifier of the ASN.1 module used to encode the parameter or message reported in the EncodedASNValue. | M |
| ExternalASNReference | ExternalASNReference | 0..1 | The formal reference notation (as described in clause D.5) for the ASN.1 component used to encode the parameter or message reported in the EncodedASNValue. Shall be present if the OBJECT IDENTIFIER is insufficient to unambiguously decode the EncodedASNValue. | C |
| EncodedASNValue | ExternalASNValue | 1 | The contents of the encoded message or parameter being reported. | M |

### M.1.2.8 Type: ExternalASNValue

Table M.1.2.8-1: Choices for the ExternalASNValue ASN.1 type

|  |  |  |
| --- | --- | --- |
| Field name | Type | Description |
| bER | OCTET STRING | Shall be used if the reported value is a BER, CER or DER encoded ASN.1 value. Shall be populated with the entire encoded payload. |
| alignedPER | OCTET STRING | Shall be used if the reported value is an aligned PER encoded ASN.1 value. Shall be populated with the entire encoded payload. |

Table M.1.2.8-2: Choices for the ExternalASNValue XSD type

|  |  |  |
| --- | --- | --- |
| Element name | Type | Description |
| BER | ExternalASN | Shall be used if the reported value is a BER, CER or DER encoded ASN.1 value. Shall be populated with the entire encoded payload. |
| AlignedPER | ExternalASN | Shall be used if the reported value is an aligned PER encoded ASN.1 value. Shall be populated with the entire encoded payload. |

END OF DOCUMENT CHANGES

START OF ATTACHMENT CHANGES

 START OF CHANGE 1

---a/33128/r18/TS33128Dictionaries.xml
+++b/33128/r18/TS33128Dictionaries.xml

@@ -58,7 +58,7 @@

58 58 </DictionaryEntry>

59 59 <DictionaryEntry>

60 60 <Value>LocationAcquisition</Value>

61 - <Meaning>A request for location information of the target, consisting at least of the TAI and the NCGI.</Meaning>

 61 + <Meaning>A request for location acquisition information of the target.</Meaning>

62 62 </DictionaryEntry>

63 63 </DictionaryEntries>

64 64 </Dictionary>

@@ -76,9 +76,17 @@

76 76 <Owner>3GPP</Owner>

77 77 <Name>LIHILAFlags</Name>

78 78 <DictionaryEntries>

 79 + <DictionaryEntry>

 80 + <Value>LocationInformation</Value>

 81 + <Meaning>Indicates whether location information of the UE is requested.</Meaning>

 82 + </DictionaryEntry>

79 83 <DictionaryEntry>

80 84 <Value>ReqCurrentLoc</Value>

81 - <Meaning>Indicates whether the current location of the UE is requested.</Meaning>

 85 + <Meaning>Indicates whether the current location of the UE is requested in case location information of the UE is requested.</Meaning>

 86 + </DictionaryEntry>

 87 + <DictionaryEntry>

 88 + <Value>ECIDMeasurements</Value>

 89 + <Meaning>Indicates whether E-CID measurements of the UE are requested.</Meaning>

82 90 </DictionaryEntry>

83 91 </DictionaryEntries>

84 92 </Dictionary>

 END OF CHANGE 1

 START OF CHANGE 2

---a/33128/r18/urn\_3GPP\_ns\_li\_3GPPLIQueryExtensions.xsd
+++b/33128/r18/urn\_3GPP\_ns\_li\_3GPPLIQueryExtensions.xsd

@@ -121,6 +121,18 @@

121 121 </xs:choice>

122 122 </xs:complexType>

123 123

 124 + <xs:complexType name="ListOfGPSI">

 125 + <xs:sequence>

 126 + <xs:element name="GPSI" type="GPSI" minOccurs="0" maxOccurs="unbounded"/>

 127 + </xs:sequence>

 128 + </xs:complexType>

 129 +

 130 + <xs:complexType name="ListOfMSISDNs">

 131 + <xs:sequence>

 132 + <xs:element name="MSISDN" type="common:InternationalE164" minOccurs="0" maxOccurs="unbounded"/>

 133 + </xs:sequence>

 134 + </xs:complexType>

 135 +

124 136 <xs:simpleType name="MCC">

125 137 <xs:restriction base="xs:string">

126 138 <xs:pattern value="[0-9]{3}"/>

@@ -157,6 +169,40 @@

157 169 <xs:restriction base="xs:base64Binary"/>

158 170 </xs:simpleType>

159 171

 172 + <xs:complexType name="ExternalASNType">

 173 + <xs:sequence>

 174 + <xs:element name="ModuleIdentifier" type="ASN1OID"/>

 175 + <xs:element name="ExternalASNReference" type="ExternalASNReference" minOccurs="0"/>

 176 + <xs:element name="EncodedASNValue" type="ExternalASNValue"/>

 177 + </xs:sequence>

 178 + </xs:complexType>

 179 +

 180 + <xs:simpleType name="ASN1OID">

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

 182 + <xs:maxLength value="255"/>

 183 + <xs:pattern value="[0-2](\.(0|[1-9][0-9]\*))\*"/>

 184 + </xs:restriction>

 185 + </xs:simpleType>

 186 +

 187 + <xs:simpleType name="ExternalASNReference">

 188 + <xs:restriction base="xs:string"/>

 189 + </xs:simpleType>

 190 +

 191 + <xs:complexType name="ExternalASNValue">

 192 + <xs:choice>

 193 + <xs:element name="BER" type="BER"/>

 194 + <xs:element name="AlignedPER" type="AlignedPER"/>

 195 + </xs:choice>

 196 + </xs:complexType>

 197 +

 198 + <xs:simpleType name="AlignedPER">

 199 + <xs:restriction base="xs:base64Binary"/>

 200 + </xs:simpleType>

 201 +

 202 + <xs:simpleType name="BER">

 203 + <xs:restriction base="xs:base64Binary"/>

 204 + </xs:simpleType>

 205 +

160 206 <xs:complexType name="NCGI">

161 207 <xs:sequence>

162 208 <xs:element name="PLMNID" type="PLMNID"/>

 END OF CHANGE 2

 START OF CHANGE 3

---a/33128/r18/urn\_3GPP\_ns\_li\_3GPPXLAExtensions.xsd
+++b/33128/r18/urn\_3GPP\_ns\_li\_3GPPXLAExtensions.xsd

@@ -9,7 +9,9 @@

9 9 <xs:complexContent>

10 10 <xs:extension base="liqr:LIQueryRequest">

11 11 <xs:sequence>

 12 + <xs:element name="LocationInformation" type="xs:boolean" default="false"/>

12 13 <xs:element name="ReqCurrentLoc" type="xs:boolean" default="false"/>

 14 + <xs:element name="ECIDMeasurements" type="xs:boolean" default="false"/>

13 15 <xs:element name="HILADelivery" type="xs:boolean" minOccurs="0"/>

14 16 <xs:element name="HI2Delivery" type="MDF2DeliveryStructure" minOccurs="0"/>

15 17 </xs:sequence>

@@ -46,6 +48,8 @@

46 48 <xs:sequence>

47 49 <xs:element name="LocationOutcomes" type="LocationOutcomes" minOccurs="0"/>

48 50 <xs:element name="EPCLocationOutcomes" type="EPCLocationOutcomes" minOccurs="0"/>

 51 + <xs:element name="ECIDMeasurementsOutcomes" type="ECIDMeasurementsOutcomes" minOccurs="0"/>

 52 + <xs:element name="EPCECIDMeasurementsOutcomes" type="EPCECIDMeasurementsOutcomes" minOccurs="0"/>

49 53 </xs:sequence>

50 54 </xs:complexType>

51 55

@@ -61,10 +65,22 @@

61 65 </xs:sequence>

62 66 </xs:complexType>

63 67

 68 + <xs:complexType name="ECIDMeasurementsOutcomes">

 69 + <xs:sequence>

 70 + <xs:element name="ECIDMeasurementsOutcome" type="ECIDMeasurementsOutcome" maxOccurs="unbounded"/>

 71 + </xs:sequence>

 72 + </xs:complexType>

 73 +

 74 + <xs:complexType name="EPCECIDMeasurementsOutcomes">

 75 + <xs:sequence>

 76 + <xs:element name="EPCECIDMeasurementsOutcome" type="EPCECIDMeasurementsOutcome" maxOccurs="unbounded"/>

 77 + </xs:sequence>

 78 + </xs:complexType>

 79 +

64 80 <xs:complexType name="LocationOutcome">

65 81 <xs:sequence>

66 82 <xs:element name="SUPI" type="liqr:SUPI"/>

67 - <xs:element name="GPSI" type="liqr:GPSI" minOccurs="0" maxOccurs="unbounded"/>

 83 + <xs:element name="GPSI" type="liqr:ListOfGPSI"/>

68 84 <xs:element name="Location" type="liqr:TS29518Location" minOccurs="0"/>

69 85 <xs:element name="FailureCause" type="liqr:ErrorInformation" minOccurs="0"/>

70 86 </xs:sequence>

@@ -73,10 +89,28 @@

73 89 <xs:complexType name="EPCLocationOutcome">

74 90 <xs:sequence>

75 91 <xs:element name="IMSI" type="common:IMSI"/>

76 - <xs:element name="MSISDNs" type="common:InternationalE164" minOccurs="0" maxOccurs="unbounded"/>

 92 + <xs:element name="MSISDNs" type="liqr:ListOfMSISDNs"/>

77 93 <xs:element name="Location" type="liqr:TS29272Location" minOccurs="0"/>

78 94 <xs:element name="FailureCause" type="liqr:ErrorInformation" minOccurs="0"/>

79 95 </xs:sequence>

80 96 </xs:complexType>

81 97

 98 + <xs:complexType name="ECIDMeasurementsOutcome">

 99 + <xs:sequence>

 100 + <xs:element name="SUPI" type="liqr:SUPI"/>

 101 + <xs:element name="GPSI" type="liqr:ListOfGPSI"/>

 102 + <xs:element name="ECIDMeasurements" type="liqr:ExternalASNType" minOccurs="0"/>

 103 + <xs:element name="FailureCause" type="liqr:ExternalASNType" minOccurs="0"/>

 104 + </xs:sequence>

 105 + </xs:complexType>

 106 +

 107 + <xs:complexType name="EPCECIDMeasurementsOutcome">

 108 + <xs:sequence>

 109 + <xs:element name="IMSI" type="common:IMSI"/>

 110 + <xs:element name="MSISDNs" type="liqr:ListOfMSISDNs"/>

 111 + <xs:element name="ECIDMeasurements" type="liqr:ExternalASNType" minOccurs="0"/>

 112 + <xs:element name="FailureCause" type="liqr:ExternalASNType" minOccurs="0"/>

 113 + </xs:sequence>

 114 + </xs:complexType>

 115 +

82 116 </xs:schema>

 END OF CHANGE 3

END OF CHANGES