**3GPP TSG- Meeting #**

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

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| --- |
|  |
| ***Title:***  |  |
|  |  |
| ***Source to WG:*** | SA3-LI () |
| ***Source to TSG:*** | SA3 |
|  |  |
| ***Work item code:*** |  |  | ***Date:*** |  |
|  |  |  |  |  |
| ***Category:*** |  |  | ***Release:*** |  |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
|  |  |
| ***Reason for change:*** | When ID association requests are from permanent (SUPI) to temporary identifiers, the NCGI is available for return to LEAs. This information is currently missing in the response structure. This CR adds the capabilty to return this information to LEAs when newly added flag for this information is set in the request. |
|  |  |
| ***Summary of change:*** | Adds LD task flag to 5.7.2.2, modifies response structure in 5.7.2.3, modifies text in 7.6.2.4, Adds capability to return NCGI to identity association XSD. |
|  |  |
| ***Consequences if not approved:*** | The identity association capability, as defined, will remain incomplete and not meet LEA needs.  |
|  |  |
| ***Clauses affected:*** | 5.7.2.2, 5.7.2.3, 7.6.2.4, Annex E |
|  |  |
|  | **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 is a R18 mirror of s3i220343XSD for this CR can be found in Forge: <https://forge.3gpp.org/rep/sa3/li/-/merge_requests/65/diffs?commit_id=7d5c599729c5457e8aa6ff54a394d48a006e3b9d> Commit hash: [31597ef1939ef245873dc57045390951d88bea02](https://forge.3gpp.org/rep/sa3/li/-/commit/31597ef1939ef245873dc57045390951d88bea02) |
|  |  |
| ***This CR's revision history:*** | s3i220352 |

START OF CHANGES

START OF FIRST CHANGE

#### 5.7.2.2 Request parameters

The RequestValues field shall contain one of the following:

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

- SUCI, given as defined in table 5.7.2-4 below.

- 5G-S-TMSI, given as defined in table 5.7.2-4 below.

- 5G-GUTI, given as defined in table 5.7.2-4 below.

If the RequestType is "OngoingIdentityAssociation" (see table 5.7.2-3), SUPI is the only valid identity type in the RequestValues field. If the RequestType is "OngoingIdentityAssociation" and any other identity type is provided, the IQF shall signal the error by setting the LDTaskObject Status to "Invalid" (see ETSI TS 103 120 [6] clause 8.3.3).

If a temporary identity is provided, the following shall also be present as RequestValues:

- NRCellIdentity, given as defined in table 5.7.2-4 below.

- TrackingAreaCode, given as defined in table 5.7.2-4 below.

The following RequestValue FormatTypes (see ETSI TS 103 120 [6] clause 8.3.5.4) are defined (which are not otherwise defined elsewhere).

Table 5.7.2-4: RequestValue FormatType extensions for LI\_HIQR Requests

| Format Owner | Format Name | Description | Format |
| --- | --- | --- | --- |
| 3GPP | SUCI | Subscription Concealed Identifier as per TS 23.003 [19] clause 2.2B. | TS 29.509 [45] clause 6.1.6.3.2 |
| 3GPP | 5GSTMSI | Shortened form of the 5G-GUTI as defined in TS 23.003 [19] clause 2.11. Given as a hyphen-separated concatenation of:- The string "5gstmsi".- The AMF Set ID given as three hexadecimal digits (10 bits).- The AMF Pointer given as two hexadecimal digits (6 bits).- The 5G-TMSI given as eight hexadecimal digits (32 bits) | Matches regular expression:^(5gstmsi-([0-3][0-9A-Fa-f]{2})-([0-3][0-9A-Fa-f])-([0-9A-Fa-f]{8}))$ |
| 3GPP | 5GGUTI | As defined in TS 23.003 [19] clause 2.10. Given as a hyphen separated concatenation of:- The string "5gguti".- MCC given as a three decimal digits.- MNC given as a two or three digit decimal digits- AMF Region ID given as two hexadecimal digits (8 bits).- The AMF Set ID, AMF Pointer and 5G-TMSI as defined above in 5GSTMSI | Matches regular expression:^(5gguti-([0-9]{3})-([0-9]{2,3})-([0-9A-Fa-f]{2})-([0-3][0-9A-Fa-f]{2})-([0-3][0-9A-Fa-f])-([0-9A-Fa-f]{8}))$ |
| 3GPP | NRCellIdentity | NR Cell ID (NCI), as defined in TS 23.003 [19] clause 19.6A | TS 29.571 [17] clause 5.4.2 |
| 3GPP | TrackingAreaCode | Tracking area code as defined in TS 23.003 [19] clause 19.4.2.3 | TS 29.571 [17] clause 5.4.2 |

The LDTaskObject may also contain the "IncludeNCGIInResponse" LDTask flag (see table 5.7.2-X). If this flag is present for such a query, then the response shall contain the NR Cell Global Identity associated with the SUPI at the time of association (see table 5.7.2-5).

Table 5.7.2-X: LDTaskFlags for LI\_HIQR Requests

|  |  |
| --- | --- |
| Dictionary Owner | Dictionary Name |
| 3GPP | LIHIQRFlags |
| Defined DictionaryEntries |
| Value | Meaning |
| IncludeNCGIInResponse | A request for returning the NCGI in the response. |

#### 5.7.2.3 Response structure

The LI\_HIQR request is used to generate a request to the ICF over LI\_XQR (see clause 5.8). The response received over LI\_XQR is then transformed into an LI\_HIQR response.

LI\_HIQR responses and updates are represented as XML following the IdentityResponseDetails type definition (see Annex E).

Responses and updates 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).

IdentityResponseDetails contain IdentityAssociation records. The fields of each IdentityAssociationRecord shall be set as follows:

Table 5.7.2-5: IdentityAssociationRecord

|  |  |  |
| --- | --- | --- |
| Field | Value | M/C/O |
| SUPI | SUPI associated with the provided identity. | M |
| SUCI | SUCI associated with the provided identity, if available. | C |
| 5G-GUTI | 5G GUTI associated with the provided identity, provided in the form given in the request (see table 5.7.2-4). | M |
| PEI | PEI associated with the provided identity during the association period, if known. | C |
| AssociationStartTime | The time that the association between the SUPI and the temporary identity became valid. (see NOTE). | M |
| AssociationEndTime | The time that the association between the SUPI and the temporary identity ceased to be valid. Shall be omitted if the association is still valid (see NOTE). | C |
| FiveGSTAIList | List of tracking areas associated with the registration area within which the UE was or is registered in the lifetime of the reported association, if available. See clause 7.6.2.4 for details. | C |
| GPSI | GPSI associated with the provided identity during the association period, if known. | C |
| NCGI | NR Cell Global Identity associated with the SUPI at the time of association between the SUPI and the temporary identity. Shall be sent if the "IncludeNCGIInResponse" flag is set. | C |
| NOTE: The AssociationStartTime and AssociationEndTime represent the lifespan of the SUPI to 5G-GUTI association. When a SUCI is present, the AssociationStartTime also represents the time of the SUCI's validity. |

If no association is found which matches the criteria provided in the LI\_XQR request, then the LI\_XQR response contains zero IdentityAssociationRecords. Similarly, the LI\_HIQR response contains zero IdentityAssociationRecords.

For responses or updates providing a currently valid SUPI to 5G-GUTI identity association, the AssociationEndTime shall be absent. The AssociationStartTime shall indicate when the 5G-GUTI became associated with the SUPI. The SUCI field shall be populated if it was present in the IEF record for the association (see clause 6.2.2A.2.1). The PEI and TAI List fields may be populated as well, see clause 7.6.2.4 for details.

In the case of ongoing updates, the presence of the AssociationEndTime indicates the SUPI to 5G-GUTI identity disassociation. Such updates shall only happen when no new association is replacing the outgoing one.

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 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, using the following Specification Dictionary extension.

Table 5.7.2-6: Specification Dictionary

|  |  |
| --- | --- |
| Dictionary Owner | Dictionary Name |
| 3GPP | ManifestSpecification. |
|  |
| Defined DictionaryEntries |
| Value | Meaning |
| LIHIQRResponse | The delivery contains IdentityResponseDetails (see Annex E) |

END OF FIRST CHANGE

START OF SECOND CHANGE

#### 7.6.2.4 ICF Identifier Association Event Handling

Upon receipt of an Association event as defined in clause 6.2.2A.2, the ICF shall cache the identifier association(s) contained within the record as followings:

- SUPI to 5G-GUTI association received, in an IEFAssociationRecord is stored by ICF as an active association. The previous active association for the same SUPI, if any, is marked as a previously active association and cached until the cache time limit is reached.

- If the IEFAssociationRecord also contains a SUCI, the SUCI is stored as a part of the received SUPI to 5G-GUTI association, for the lifetime of that association.

- Where the IEFDeassociationRecord corresponds to an active SUPI to 5G-GUTI association at ICF, the association is marked as a previously active association and cached until the cache time limit is reached.

The ICF shall have a CSP defined maximum active association lifetime (upon expiry of which the association is deleted from the ICF).

NOTE 1: This is needed to prevent an association from not being deleted from ICF under some error conditions (e.g. a loss of IEF message carrying IEFDeassociationRecord caused by the implicit deregistration of an out-of-service UE). The selection of the maximum active association lifetime value needs to ensure that no valid active associations are deleted upon the lifetime expiry, i.e. the longest possible association refresh time supported by CSP’s network needs to be accommodated.

For previous associations placed in the cache, the ICF shall store the times of association and disassociation, respectively.

Where an IEFAssociationRecord contains a PEI, GPSI, NCGI or a TAI list, the ICF shall store the received values and associate them both the current received SUPI to 5G-GUTI association and any future association until:

- A subsequent IEFAssociationRecord is received which updates the PEI, GPSI, NCGI or TAI list values.

- The old PEI / GPSI / NCGI / TAI list shall be retained in association with previous SUPI to 5G-GUTI associations until those associations are deleted from cache.

- New PEI / GPSI / NCGI / TAI list shall be used in association with both the association(s) with which it was received and any subsequent associations until another update is received.

- All SUPI associations for which the PEI / GPSI / NCGI / TAI list is valid are deleted from the cache.

When the ICF receives a query request from the IQF as defined in clause 7.6.2.3, the ICF shall search available identifier associations (both active associations and those marked for deletion in the cache) for a match. The ICF shall be able to use both time and TAI (as a single TAI and in relation to a TAI list) to identify the correct SUPI to 5G-GUTI association(s). For associations which have been disassociated (and will be deleted once the cache time limit is reached), the time of disassociation is used by the ICF to identify the correct association match (based on observed time in LEA request), where multiple associations are held in the cache.

NOTE 2: Use of nCGI to match associations based on physical location for SUCI / 5G-S-TMSI to SUPI requests, is out of scope of the present document.

As the LEA and CSP are unlikely to have synchronised the time of identifier observation / association provided by the LEA in the query request, with NF time of the IEFs, the ICF shall search the cached identifier associations using a short window time duration both before and after (subject to overall cache duration) the observed time provided by the LEA in the RequestValues over LI\_XQR.

NOTE 3: While the search window duration before and after the LEA provided observed time value is outside the scope of the present document, selection of this value by the CSP needs to take into consideration, among other aspects, the duration of a potential period of recovery from a 5G-GUTI update error, in order to prevent missing of otherwise matching associations due to discrepancies between their stored association/disassociation time and the observed time provided by LEA.

NOTE 4: While the value of the short-term caching time is outside the scope of the present document, selection of this value by the CSP needs to take into consideration, among other aspects, the duration of potential period of recovery from a 5G-GUTI update error, in order to prevent previous associations being deleted before they have been fully disassociated by both the UE and AMF.

END OF SECOND CHANGE

START OF THIRD CHANGE

Annex E (normative):
XSD Schema for Identity Association

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

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

 xmlns="urn:3GPP:ns:li:3GPPIdentityExtensions:r17:v3"

 xmlns:x1="http://uri.etsi.org/03221/X1/2017/10"

 xmlns:common="http://uri.etsi.org/03280/common/2017/07"

 targetNamespace="urn:3GPP:ns:li:3GPPIdentityExtensions:r17:v3"

 elementFormDefault="qualified">

 <xs:import namespace="http://uri.etsi.org/03221/X1/2017/10"/>

 <xs:import namespace="http://uri.etsi.org/03280/common/2017/07"/>

 <xs:complexType name="IdentityAssociationRequest">

 <xs:complexContent>

 <xs:extension base="x1:X1RequestMessage">

 <xs:sequence>

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

 </xs:sequence>

 </xs:extension>

 </xs:complexContent>

 </xs:complexType>

 <xs:complexType name="RequestDetails">

 <xs:sequence>

 <xs:element name="Type" type="DictionaryEntry"/>

 <xs:element name="ObservedTime" type="common:QualifiedDateTime"/>

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

 </xs:sequence>

 </xs:complexType>

 <xs:complexType name="RequestValues">

 <xs:sequence>

 <xs:element name="RequestValue" type="RequestValue" maxOccurs="unbounded"/>

 </xs:sequence>

 </xs:complexType>

 <xs:complexType name="RequestValue">

 <xs:sequence>

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

 <xs:element name="Value" type="common:LongString"/>

 </xs:sequence>

 </xs:complexType>

 <xs:complexType name="FormatType">

 <xs:sequence>

 <xs:element name="FormatOwner" type="common:ShortString"/>

 <xs:element name="FormatName" type="common:ShortString"/>

 </xs:sequence>

 </xs:complexType>

 <xs:complexType name="DictionaryEntry">

 <xs:sequence>

 <xs:element name="Owner" type="common:ShortString"/>

 <xs:element name="Name" type="common:ShortString"/>

 <xs:element name="Value" type="common:ShortString"/>

 </xs:sequence>

 </xs:complexType>

 <xs:complexType name="IdentityAssociationResponse">

 <xs:complexContent>

 <xs:extension base="x1:X1ResponseMessage">

 <xs:sequence>

 <xs:element name="ResponseDetails" type="IdentityResponseDetails"/>

 </xs:sequence>

 </xs:extension>

 </xs:complexContent>

 </xs:complexType>

<xs:element name="LIHIQRResponse" type="IdentityResponseDetails"/>

<xs:complexType name="IdentityResponseDetails">

 <xs:sequence>

 <xs:element name="Associations" type="IdentityAssociationRecords"/>

 </xs:sequence>

 </xs:complexType>

 <xs:complexType name="IdentityAssociationRecords">

 <xs:sequence>

 <xs:element name="IdentityAssociationRecord" type="IdentityAssociationRecord" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 </xs:complexType>

 <xs:complexType name="IdentityAssociationRecord">

 <xs:sequence>

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

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

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

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

 <xs:element name="AssociationStartTime" type="common:QualifiedMicrosecondDateTime"/>

 <xs:element name="AssociationEndTime" type="common:QualifiedMicrosecondDateTime" minOccurs="0"/>

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

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

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

 </xs:sequence>

 </xs:complexType>

 <xs:complexType name="SUPI">

 <xs:choice>

 <xs:element name="SUPIIMSI" type="common:SUPIIMSI"/>

 <xs:element name="SUPINAI" type="common:SUPINAI"/>

 </xs:choice>

 </xs:complexType>

 <xs:simpleType name="SUCI">

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

 </xs:simpleType>

 <xs:simpleType name="FiveGGUTI">

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

 </xs:simpleType>

 <xs:complexType name="PEI">

 <xs:choice>

 <xs:element name="PEIIMEI" type="common:PEIIMEI"/>

 <xs:element name="PEIIMEISV" type="common:PEIIMEISV"/>

 <xs:element name="PEIMAC" type="common:MACAddress"/>

 </xs:choice>

 </xs:complexType>

 <xs:complexType name="FiveGSTAIList">

 <xs:sequence>

 <xs:element name="FiveGSTAI" type="FiveGSTAI" maxOccurs="unbounded"/>

 </xs:sequence>

 </xs:complexType>

 <xs:complexType name="FiveGSTAI">

 <xs:sequence>

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

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

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

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

 </xs:sequence>

 </xs:complexType>

 <xs:complexType name="GPSI">

 <xs:choice>

 <xs:element name="GPSIMSISDN" type="common:GPSIMSISDN"/>

 <xs:element name="GPSINAI" type="common:GPSINAI"/>

 </xs:choice>

 </xs:complexType>

 <xs:complexType name="NCGI">

 <xs:sequence>

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

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

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

 <xs:element name="NCGITime" type="common:QualifiedMicrosecondDateTime"/>

 </xs:sequence>

 </xs:complexType>

 <xs:complexType name="PLMNID">

 <xs:sequence>

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

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

 </xs:sequence>

 </xs:complexType>

 <xs:simpleType name="NRCellID">

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

 <xs:pattern value="([A-Fa-f0-9]{9})"></xs:pattern>

 </xs:restriction>

 </xs:simpleType>

 <xs:simpleType name="MCC">

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

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

 </xs:restriction>

 </xs:simpleType>

 <xs:simpleType name="MNC">

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

 <xs:pattern value="[0-9]{2,3}"></xs:pattern>

 </xs:restriction>

 </xs:simpleType>

 <xs:simpleType name="TAC">

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

 <xs:pattern value="([A-Fa-f0-9]{2}){2,3}"></xs:pattern>

 </xs:restriction>

 </xs:simpleType>

 <xs:simpleType name="NID">

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

 <xs:pattern value="[A-Fa-f0-9]{11}"></xs:pattern>

 </xs:restriction>

 </xs:simpleType>

 <xs:complexType name="ActivateAssociationUpdates">

 <xs:complexContent>

 <xs:extension base="x1:X1RequestMessage">

 <xs:sequence>

 <xs:element name="OngoingAssociationTaskID" type="common:UUID"></xs:element>

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

 </xs:sequence>

 </xs:extension>

 </xs:complexContent>

 </xs:complexType>

 <xs:complexType name="ActivateAssociationUpdatesAcknowledgement">

 <xs:complexContent>

 <xs:extension base="x1:X1ResponseMessage">

 <xs:sequence>

 <xs:element name="oK" type="x1:OKAckAndComplete"/>

 <xs:element name="CurrentAssociations" type="IdentityResponseDetails"></xs:element>

 </xs:sequence>

 </xs:extension>

 </xs:complexContent>

 </xs:complexType>

 <xs:complexType name="DeactivateAssociationUpdates">

 <xs:complexContent>

 <xs:extension base="x1:X1RequestMessage">

 <xs:sequence>

 <xs:element name="OngoingAssociationTaskID" type="common:UUID"></xs:element>

 </xs:sequence>

 </xs:extension>

 </xs:complexContent>

 </xs:complexType>

 <xs:complexType name="DeactivateAssociationUpdatesAcknowledgement">

 <xs:complexContent>

 <xs:extension base="x1:X1ResponseMessage">

 <xs:sequence>

 <xs:element name="oK" type="x1:OKAckAndComplete"/>

 </xs:sequence>

 </xs:extension>

 </xs:complexContent>

 </xs:complexType>

 <xs:complexType name="IdentityAssociationUpdate">

 <xs:complexContent>

 <xs:extension base="x1:X1RequestMessage">

 <xs:sequence>

 <xs:element name="OngoingAssociationTaskID" type="common:UUID"/>

 <xs:element name="UpdateDetails" type="IdentityResponseDetails"/>

 </xs:sequence>

 </xs:extension>

 </xs:complexContent>

 </xs:complexType>

 <xs:complexType name="IdentityAssociationUpdateAcknowledgement">

 <xs:complexContent>

 <xs:extension base="x1:X1ResponseMessage">

 <xs:sequence>

 <xs:element name="oK" type="x1:OKAckAndComplete"/>

 </xs:sequence>

 </xs:extension>

 </xs:complexContent>

 </xs:complexType>

</xs:schema>

END OF THIRD CHANGE

END OF ALL CHANGES