**3GPP TSG-CT WG1 Meeting #123-eC1-20xxxx**

**Electronic meeting, 16-24 April 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **24.587** | **CR** | **0018** | **rev** | **1** | **Current version:** | **16.0.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network |  |

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|  | | | | | | | | | | |
| ***Title:*** | Encoding of link identifier update messages and parameters | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | vivo | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eV2XARC | | | | |  | ***Date:*** | | | 2020-04-10 |
|  |  | | | |  | |  | | |  |
| ***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:*** | | The encoding of PC5 unicast link identifier update messages and parameters is still missing. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Add the encoding of PC5 unicast link identifier update messages and parameters. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | No encoding of PC5 unicast link identifier update messages and parameters. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 7.3.a(new), 7.3.b(new), 7.3.c(new), 7.3.d(new) 8.4.1, 8.4.x(new) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

\* \* \* First Change \* \* \* \*

### 7.3.a Direct link identifier update request

#### 7.3.a.1 Message definition

This message is sent by a UE to another peer UE to initiate the direct link identifier procedure. See table 7.3.a.1.1.

Message type: DIRECT LINK IDENTIFIER UPDATE REQUEST

Significance: dual

Direction: UE to peer UE

Table 7.3.a.1.1: DIRECT LINK IDENTIFIER UPDATE REQUEST message content

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IEI | Information Element | Type/Reference | Presence | Format | Length |
|  | DIRECT LINK IDENTIFIER UPDATE REQUEST message identity | PC5 signalling message type  8.4.1 | M | V | 1 |
|  | Sequence number | Sequence number  8.4.2 | M | V | 1 |
|  | MSB of KNRP-sess ID | MSB of KNRP-sess ID  8.4.y | M | V | 1 |
|  | Layer-2 ID | Layer-2 ID  8.4.x | M | V | 3 |
| TBD | Source user info | Application layer ID  8.4.4 | O | TLV | 4-254 |
| 58 | Link local IPv6 address | Link local IPv6 address  8.4.7 | O | TV | 17 |

#### 7.3.a.2 Source user info

This IE is included when the initiating UE receives a new initiating UE’s application layer ID during PC5 unicast link identifier update procedure.

#### 7.3.a.3 Link local IPv6 address

This IE is included when the PC5 unicast link identifier update procedure is triggered by the expiry of the privacy timer of initating UE’s layer 2 ID and the initiating UE decides to change the IP address/prefix.

\* \* \* Next Change \* \* \* \*

### 7.3.b Direct link identifier update accept

#### 7.3.b.1 Message definition

This message is sent by the UE to another peer UE to indicate that the link identifier update request is accepted. See table 7.3.b.1.

Message type: DIRECT LINK IDENTIFIER UPDATE ACCEPT

Significance: dual

Direction: UE to peer UE

Table 7.3.b.1.1: DIRECT LINK IDENTIFIER UPDATE ACCEPT message content

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IEI | Information Element | Type/Reference | Presence | Format | Length |
|  | DIRECT LINK IDENTIFIER UPDATE ACCEPT message identity | PC5 signalling message type  8.4.1 | M | V | 1 |
|  | Sequence number | Sequence number  8.4.2 | M | V | 1 |
| 28 | Target user info | Application layer ID  8.4.4 | O | TLV | 4-254 |
| TBD | LSB of KNRP-sess ID | LSB of KNRP-sess ID  8.4.z | O | TV | 2 |
| TBD | Layer-2 ID | Layer-2 ID  8.4.x | O | TV | 4 |
| 58 | Link local IPv6 address | Link local IPv6 address  8.4.7 | O | TV | 17 |

#### 7.3.b.2 Target user info

This IE is included when the target UE decides to change its identifiers and receives a new application layer ID from upper layers during the PC5 unicast link identifier update procedure.

#### 7.3.b.3 LSB of KNRP-sess ID

This IE is included when the target UE decides to change its identifiers based on the privacy configuration during the PC5 unicast link identifier update procedure.

#### 7.3.b.4 Layer-2 ID

This IE is included when the target UE decides to change its identifiers based on the privacy configuration during the PC5 unicast link identifier update procedure.

#### 7.3.b.5 Link local IPv6 address

This IE is included when the target UE decides to change its identifiers which includes IP address/prefix during the PC5 unicast link identifier update procedure.

\* \* \* Next Change \* \* \* \*

### 7.3.c Direct link identifier update acknowledgement

#### 7.3.c.1 Message definition

This message is sent by the initiating UE to target UE to indicate that the initiating UE has received target UE’s accept message. See table 7.3.c.1.

Message type: DIRECT LINK IDENTIFIER UPDATE ACK

Significance: dual

Direction: UE to peer UE

Table 7.3.c.1.1: DIRECT LINK IDENTIFIER UPDATE ACK message content

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IEI | Information Element | Type/Reference | Presence | Format | Length |
|  | DIRECT LINK IDENTIFIER UPDATE ACK message identity | PC5 signalling message type  8.4.1 | M | V | 1 |
|  | Sequence number | Sequence number  8.4.2 | M | V | 1 |
| 28 | Target user info | Application layer ID  8.4.4 | O | TLV | 4-254 |
|  | LSB of KNRP-sess ID | LSB of KNRP-sess ID  8.4.z | O | TV | 2 |
| TBD | Layer-2 ID | Layer-2 ID  8.4.x | O | TV | 4 |
| 58 | Link local IPv6 address | Link local IPv6 address  8.4.7 | O | TV | 17 |

#### 7.3.c.2 Target user info

This IE is included when the DIRECT LINK IDENTIFIER UPDATE ACCEPT message includes the target UE’s new application layer ID during the PC5 unicast link identifier update procedure.

#### 7.3.c.3 LSB of KNRP-sess ID

This IE is included when the DIRECT LINK IDENTIFIER UPDATE ACCEPT message includes the targte UE’s new security infomation during the PC5 unicast link identifier update procedure.

#### 7.3.c.4 Layer-2 ID

This IE is included when DIRECT LINK IDENTIFIER UPDATE ACCEPT message includes the target UE’s new layer-2 ID during the PC5 unicast link identifier update procedure.

#### 7.3.c.5 Link local IPv6 address

This IE is included when DIRECT LINK IDENTIFIER UPDATE ACCEPT message includes the target UE’s new IP address/prefix during the PC5 unicast link identifier update procedure.

\* \* \* Next Change \* \* \* \*

### 7.3.d Direct link identifier update reject

#### 7.3.d.1 Message definition

This message is sent by the target UE to initiating UE to indicate that the link identifier update request is not accepted. See table 7.3.d.1.

Message type: DIRECT LINK IDENTIFIER UPDATE REJECT

Significance: dual

Direction: UE to peer UE

Table 7.3.d.1.1: DIRECT LINK IDENTIFIER UPDATE REJECT message content

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IEI | Information Element | Type/Reference | Presence | Format | Length |
|  | DIRECT LINK IDENTIFIER UPDATE REJECT message identity | PC5 signalling message type  8.4.1 | M | V | 1 |
|  | Sequence number | Sequence number  8.4.2 | M | V | 1 |
|  | PC5 signalling protocol cause | PC5 signalling protocol cause  8.4.9 | M | V | 1 |

\* \* \* Next Change \* \* \* \*

### 8.4.1 PC5 signalling message type

The purpose of the PC5 signalling message type information element is to indicate the type of messages used in PC5 signalling protocol.

The value part of the PC5 signalling message type information element used in the PC5 signalling messages is coded as shown in table 8.4.1.1.

The PC5 signalling message type is a type 3 information element, with the length of 1 octet.

Table 8.4.1.1: PC5 signalling message type

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Bits | | | | | | | |  |  |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |  | DIRECT LINK ESTABLISHMENT REQUEST |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |  | DIRECT LINK ESTABLISHMENT ACCEPT |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |  | DIRECT LINK ESTABLISHMENT REJECT |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |  | DIRECT LINK MODIFICATION REQUEST |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |  | DIRECT LINK MODIFICATION ACCEPT |
| 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |  | DIRECT LINK MODIFICATION REJECT |
| 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |  | DIRECT LINK RELEASE REQUEST |
| 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |  | DIRECT LINK RELEASE ACCEPT |
| 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |  | DIRECT LINK KEEPALIVE REQUEST |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |  | DIRECT LINK KEEPALIVE RESPONSE |
| A  B  C  D | A  B  C  D | A  B  C  D | A  B  C  D | A  B  C  D | A  B  C  D | A  B  C  D | A  B  C  D |  | DIRECT LINK IDENTIFIER UPDATE REQUEST  DIRECT LINK IDENTIFIER UPDATE ACCEPT  DIRECT LINK IDENTIFIER UPDATE ACK  DIRECT LINK IDENTIFIER UPDATE REJECT |
|  | | | | | | | | | |

Editor's note: The values of the other PC5 signalling messages are FFS.

\* \* \* Next Change \* \* \* \*

### 8.4.x Layer-2 ID

The purpose of the layer-2 ID information element is to indicate the layer-2 ID that is used by UE.

The layer-2 ID is a type 3 information element with a length of 4 octets.

The layer-2 ID information element is coded as shown in figure 8.4.x.1 and table 8.4.x.1.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Layer-2 ID IEI | | | | | | | | octet 1 |
| Layer-2 ID | | | | | | | | octet 2 |
|  | | | | | | | | octet 4 |

Figure 8.4.x.1: Layer-2 ID information element

Table 8.4.x.1: Layer-2 ID information element

|  |
| --- |
| Layer-2 ID (octet 2 to 4)  This field contains the 24-bit layer-2 ID. |

\* \* \* End of changes \* \* \* \*