**3GPP TSG-CT WG1 Meeting #136-eC1-22xxxx**

**E-Meeting, 12th – 20th May 2022 *was C1-223578***

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **24.587** | **CR** | **0239** | **rev** | **1** | **Current version:** | **16.8.0** |  |
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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 | **X** | Radio Access Network |  | Core Network |  |

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| ***Title:***  | Abort PC5 unicast link establishment procedure if including Target user info for R16 |
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| ***Source to WG:*** | Huawei, HiSilicon |
| ***Source to TSG:*** | C1 |
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| ***Work item code:*** | eV2XARC |  | ***Date:*** | 2022-05-01 |
|  |  |  |  |  |
| ***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 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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
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| ***Reason for change:*** | Only if the Target user info is included in the DIRECT LINK ESTABLISHMENT REQUEST message, when the UE doesn’t accept the triggered PC5 unicast link authentication procedure, The UE shall abort the PC5 unicast link establishment procedure. If the Target user info is not included, the initiate UE shall not abort the PC5 unicast link establishment procedure because it shall wait for the reply from other UEs until some conditions are met, e.g. T5000 expires.Hence, that the Target user info is included in the DIRECT LINK ESTABLISHMENT REQUEST message seems missing from clause 6.1.2.6.5A:*Upon receipt of the DIRECT LINK AUTHENTICATION FAILURE message, the target UE shall abort the ongoing procedure that triggered the initiation of the PC5 unicast link authentication procedure and shall indicate to upper layers that authentication has failed.*It also seems missing from clause 6.1.2.2.5:*Upon receipt of the DIRECT LINK ESTABLISHMENT REJECT message, the initiating UE shall stop timer T5000 and abort the PC5 unicast link establishment procedure. If the PC5 signalling protocol cause value in the DIRECT LINK ESTABLISHMENT REJECT message is #1 "direct communication to the target UE not allowed" or #5 "lack of resources for PC5 unicast link", then the UE shall not attempt to start the PC5 unicast link establishment procedure with the same target UE at least for a time period T.*If the condition that the Target user info is included in the DIRECT LINK ESTABLISHMENT REQUEST message is not specified, the specification is not correct. |
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| ***Summary of change:*** | Add that the Target user info is included in the DIRECT LINK ESTABLISHMENT REQUEST message as a condition for UE aborting the PC5 unicast link establishment procedure. |
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| ***Consequences if not approved:*** | If the condition that the Target user info is included in the DIRECT LINK ESTABLISHMENT REQUEST message is not specified, the specification is not correct. |
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| ***Clauses affected:*** | 6.1.2.2.5, 6.1.2.6.5A |
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|  | **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 \*\*\*\*\*

##### 6.1.2.2.5 PC5 unicast link establishment procedure not accepted by the target UE

If the DIRECT LINK ESTABLISHMENT REQUEST message cannot be accepted, the target UE shall send a DIRECT LINK ESTABLISHMENT REJECT message. The DIRECT LINK ESTABLISHMENT REJECT message contains a PC5 signalling protocol cause IE set to one of the following cause values:

#1 direct communication to the target UE not allowed;

#3 conflict of layer-2 ID for unicast communication is detected;

#5 lack of resources for PC5 unicast link; or

#111 protocol error, unspecified.

If the target UE is not allowed to accept the DIRECT LINK ESTABLISHMENT REQUEST message .e.g. based on operator policy or configuration parameters for V2X communication over PC5 as specified in clause 5.2.3, the target UE shall send a DIRECT LINK ESTABLISHMENT REJECT message containing PC5 signalling protocol cause value #1 "direct communication to the target UE not allowed".

For a received DIRECT LINK ESTABLISHMENT REQUEST message from a layer-2 ID (for unicast communication), if the target UE already has an existing link established to a UE using this layer-2 ID or is currently processing a DIRECT LINK ESTABLISHMENT REQUEST message from the same layer-2 ID, and with one of following parameters different from the existing link or the link for which the link establishment is in progress:

a) the source user info;

b) type of data (e.g. IP or non-IP); or

c) security policy,

the target UE shall send a DIRECT LINK ESTABLISHMENT REJECT message containing PC5 signalling protocol cause value #3 "conflict of layer-2 ID for unicast communication is detected".

NOTE: The type of data (e.g. IP or non-IP) is indicated by the optional IP address configuration IE included in the corresponding DIRECT LINK SECURITY MODE COMPLETE message, i.e the type of data for the requested link is IP type if this IE is included, and the type of data for the requested link is non-IP if this IE is not included.

If the PC5 unicast link establishment fails due to the congestion problems, the implementation-specific maximum number of established NR PC5 unicast links has been reached, or other temporary lower layer problems causing resource constraints, the target UE shall send a DIRECT LINK ESTABLISHMENT REJECT message containing PC5 signalling protocol cause value #5 "lack of resources for PC5 unicast link". If the PC5 unicast link establishment fails due to other reasons, the target UE shall send a DIRECT LINK ESTABLISHMENT REJECT message containing PC5 signalling protocol cause value #111 "protocol error, unspecified".

After sending the DIRECT LINK ESTABLISHMENT REJECT message, the target UE shall provide the following information along with the initiating UE's layer-2 ID for unicast communication and the target UE's layer-2 ID for unicast communication to the lower layer:

a) an indication of deactivation of the PC5 unicast security protection and deletion of security context for the PC5 unicast link, if applicable.

Upon receipt of the DIRECT LINK ESTABLISHMENT REJECT message, the initiating UE shall stop timer T5000 and abort the PC5 unicast link establishment procedure, if the Target user info is included in the DIRECT LINK ESTABLISHMENT REQUEST message. If the PC5 signalling protocol cause value in the DIRECT LINK ESTABLISHMENT REJECT message is #1 "direct communication to the target UE not allowed" or #5 "lack of resources for PC5 unicast link", then the UE shall not attempt to start the PC5 unicast link establishment procedure with the same target UE at least for a time period T.

NOTE: The length of time period T is UE implementation specific and can be different for the case when the UE receives PC5 signalling protocol cause value #1 "direct communication to the target UE not allowed" or when the UE receives PC5 signalling protocol cause value #5 "lack of resources for PC5 unicast link".

After receiving the DIRECT LINK ESTABLISHMENT REJECT message, the initiating UE shall provide the following information along with the initiating UE's layer-2 ID for unicast communication and the target UE's layer-2 ID for unicast communication to the lower layer:

a) an indication of deactivation of the PC5 unicast security protection and deletion of security context for the PC5 unicast link, if applicable.

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

\*\*\*\*\*Next change \*\*\*\*\*

##### 6.1.2.6.5A PC5 unicast link authentication procedure not accepted by the initiating UE

If the DIRECT LINK AUTHENTICATION RESPONSE message cannot be accepted, the initiating UE shall stop timer T5006 and create a DIRECT LINK AUTHENTICATION FAILURE message. In this message, the initiating UE may include the Key establishment information container IE if provided by upper layers.

After the DIRECT LINK AUTHENTICATION FAILURE message is generated, the initiating UE shall pass this message to the lower layers for transmission along with the initiating UE's layer-2 ID for unicast communication and the target UE's layer-2 ID for unicast communication.

The initiating UE shall abort the ongoing procedure that triggered the initiation of the PC5 unicast link authentication procedure.

Upon receipt of the DIRECT LINK AUTHENTICATION FAILURE message and if the PC5 unicast link authentication procedure was initiated due to a PC5 unicast link establishment procedure that includes a Target user info in the DIRECT LINK ESTABLISHMENT REQUEST message, the target UE shall abort the ongoing procedure that triggered the initiation of the PC5 unicast link authentication procedure and shall indicate to upper layers that authentication has failed.

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