**3GPP TSG-CT WG1 Meeting #138-eC1-22xxxx**

**E-Meeting, 10th – 14th October 2022**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **24.554** | **CR** | **0185** | **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 | **x** | Radio Access Network |  | Core Network |  |

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| ***Title:***  | Correction on cause value #14 |
|  |  |
| ***Source to WG:*** |  |
| ***Source to TSG:*** | CT1 |
|  |  |
| ***Work item code:*** | 5G\_ProSe |  | ***Date:*** | 2022/09/20 |
|  |  |  |  |  |
| ***Category:*** | F |  | ***Release:*** | Rel-17 |
|  | *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)* |
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| ***Reason for change:*** | Currently there is a collision of PC5 signalling protocol cause value #14. "security procedure failure of 5G ProSe UE-to-network relay" is defined as #15, but there are three occasions describing the cause value to #14.#14 is for "Authentication synchronisation error", as specified in Table 11.3.8.1: PC5 signalling protocol cause information element.Backwards compatibility analysisThis CR is backward compatible as the cause value is correctly defined in the coding.  |
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| ***Summary of change:*** | Correct the cause value #14 to #15 for "Security procedure failure of 5G ProSe UE-to-network relay " |
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| ***Consequences if not approved:*** | Duplicated cause value will cause misimplementation.  |
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| ***Clauses affected:*** | 7.2.2.5, 8.2.3.2 |
|  |  |
|  | **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 CHANGES\*\*\*

#### 7.2.2.5 5G ProSe direct link establishment procedure not accepted by the target UE

If the PROSE DIRECT LINK ESTABLISHMENT REQUEST message cannot be accepted, the target UE shall send a PROSE DIRECT LINK ESTABLISHMENT REJECT message. The PROSE 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 5G ProSe direct link;

#13 congestion situation;

#15 security procedure failure of 5G ProSe UE-to-network relay; or

#111 protocol error, unspecified.

If the target UE is not allowed to accept the PROSE DIRECT LINK ESTABLISHMENT REQUEST message, e.g., based on operator policy or configuration parameters for ProSe direct communication over PC5 as specified in clause 5.2, or the target UE is acting as a layer-3 relay UE, is in non-allowed area of its serving PLMN and the corresponding relay service code is not associated with high priority access as defined in clause 5.3.5 of 3GPP TS 24.501 [11], the target UE shall send a PROSE DIRECT LINK ESTABLISHMENT REJECT message containing PC5 signalling protocol cause value #1 "direct communication to the target UE not allowed".

For a received PROSE 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 PROSE 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 PROSE DIRECT LINK ESTABLISHMENT REJECT message containing PC5 signalling protocol cause value #3 "conflict of layer-2 ID for unicast communication is detected".

NOTE 1: If the UE is processing a PROSE DIRECT DISCOVERY message from the same source layer-2 ID of the received PROSE DIRECT LINK ESTABLISHMENT REQUEST message, it depends on UE implementation to avoid the conflict of destination layer-2 ID (e.g. send a PROSE DIRECT LINK ESTABLISHMENT REJECT message containing PC5 signalling protocol cause value #3 "conflict of layer-2 ID for unicast communication is detected", or ignore the PROSE DIRECT DISCOVERY message).

NOTE 2: 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 5G ProSe direct link establishment fails due to the implementation-specific maximum number of established 5G ProSe direct links has been reached, or other temporary lower layer problems causing resource constraints, the target UE shall send a PROSE DIRECT LINK ESTABLISHMENT REJECT message containing PC5 signalling protocol cause value #5 "lack of resources for 5G ProSe direct link".

If the 5G ProSe direct link establishment request is for relaying and:

a) the NAS level mobility management congestion control as specified in clause 5.3.9 of TS 24.501 [11] is activated at the target UE; or

b) the target UE is under congestion;

the target UE shall send a PROSE DIRECT LINK ESTABLISHMENT REJECT message containing PC5 signalling protocol cause value #13 "congestion situation". The target UE may provide a back-off timer value to the initiating UE in the PROSE DIRECT LINK ESTABLISHMENT REJECT message. The target UE shall not accept any 5G ProSe direct link establishment request for relaying if the back-off timer for NAS level mobility management congestion control is running.

If the 5G ProSe direct link establishment request is for relaying, the NAS level session management congestion as specified in clause 6.2.7 and in clause 6.2.8 of TS 24.501 [11] is activated at the target UE which is acting as a 5G ProSe layer-3 UE-to-network relay UE, and the relay service code used in the 5G ProSe direct link establishment corresponds to a DNN and/or S-NSSAI for which the NAS level session management congestion is activated, and the target UE needs to perform the PDU session establishment procedure for the DNN and/or S-NSSAI or the PDU session modification procedure for the DNN and/or S-NSSAI, then the target UE shall send a PROSE DIRECT LINK ESTABLISHMENT REJECT message containing PC5 signalling protocol cause value #13 "congestion situation". The target UE may provide a back-off timer value to the initiating UE in the PROSE DIRECT LINK ESTABLISHMENT REJECT message.

NOTE 3: How the target UE determines that it is under congestion is implementation specific (e.g., any relaying related operational overhead, etc).

NOTE 4: In case the target UE is under the NAS level mobility management congestion control, it is an implementation option that the provided back-off timer value to the initiating UE is set to the remaining time of the mobility management back-off timer T3346 or with an additional offset value.

If the 5G ProSe direct link establishment request is for relaying, the request required the establishment of a PDU session by the 5G ProSe layer-3 UE-to-network relay UE which is a target UE, and the PDU session establishment was unsuccessful due to the reception of 5GSM cause #8 "maximum number of PDU sessions reached", #27 "Missing or unknown DNN", #28 "Unknown PDU session type", #29 "user authentication or authorization failed", #31 "request rejected, unspecified", #32 "service option not supported", #33 "requested service option not subscribed", or #65 "maximum number of PDU sessions reached" as specified in 3GPP TS 24.501 [11], then target UE shall send a PROSE DIRECT LINK ESTABLISHMENT REJECT message containing PC5 signalling protocol cause value #111 "protocol error, unspecified".

If the 5G ProSe direct link establishment procedure is for direct communication between the 5G ProSe remote UE and the 5G ProSe UE-to-network relay UE and it fails due to a failure in the security procedure over control plane or security procedure over user plane as specified in 3GPP TS 33.503 [34], the target UE shall send a PROSE DIRECT LINK ESTABLISHMENT REJECT message containing PC5 signalling protocol cause value #15 "security procedure failure of 5G ProSe UE-to-network relay". The target UE shall provide the EAP message if received from the network according to the security procedure over control plane as specified in 3GPP TS 33.503 [34].

If the 5G ProSe direct link establishment fails due to other reasons, the target UE shall send a PROSE DIRECT LINK ESTABLISHMENT REJECT message containing PC5 signalling protocol cause value #111 "protocol error, unspecified".

After sending the PROSE 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 5G ProSe direct link, if applicable.

Upon receipt of the PROSE DIRECT LINK ESTABLISHMENT REJECT message, the initiating UE shall stop timer T5080 and abort the 5G ProSe direct link establishment procedure. If the PC5 signalling protocol cause value in the PROSE DIRECT LINK ESTABLISHMENT REJECT message is #1 "direct communication to the target UE not allowed" or #5 "lack of resources for 5G ProSe direct link", then the initiating UE shall not attempt to start the 5G ProSe direct link establishment procedure with the same target UE at least for a time period T. If the PC5 signalling protocol cause value in the PROSE DIRECT LINK ESTABLISHMENT REJECT message is #13 "congestion situation" and a back-off timer value is provided in the PROSE DIRECT LINK ESTABLISHMENT REJECT message, the initiating UE shall start timer T5088 associated with the layer-2 ID of the target UE and set its value to the provided timer value.

NOTE 5: 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 5G ProSe direct link".

After receiving the PROSE 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 5G ProSe direct link, if applicable.

\*\*\*SECOND CHANGES\*\*\*

#### 8.2.3.2 UE-to-network relay reselection procedure initiation

The 5G ProSe remote UE shall trigger the UE-to-network relay reselection procedure if one of the following conditions is met:

a) the UE has received a lower layers indication that the serving 5G ProSe UE-to-network relay UE no longer fulfills the lower layers criteria as specified in 3GPP TS 38.331 [13];

b) the parameters related to 5G ProSe UE-to-network relay in the configuration parameters for 5G ProSe UE-to-network relay as specified in clause 5.2.5 (e.g., relay service code, User info ID, etc.) have been updated and the serving 5G ProSe UE-to-network relay UE no longer fulfills the conditions specified in clause 8.2.1.2.2;

c) the UE has received a PROSE DIRECT LINK ESTABLISHMENT REJECT message from the 5G ProSe UE-to-network relay UE with the PC5 signalling protocol cause value #1 "direct communication to the target UE not allowed";

d) the UE has received a PROSE DIRECT LINK RELEASE REQUEST message from the 5G ProSe UE-to-network relay UE with the PC5 signalling protocol cause value #1 "direct communication to the target UE not allowed";

e) the UE has received a PROSE DIRECT LINK RELEASE REQUEST message from the 5G ProSe UE-to-network relay UE with the PC5 signalling protocol cause value #4 "direct connection is not available anymore";

f) the UE has not received any response from the 5G ProSe UE-to-network relay UE after M consecutive retransmissions of PROSE DIRECT LINK ESTABLISHMENT REQUEST or PROSE DIRECT LINK KEEPALIVE REQUEST messages;

g) the UE has not received any response from the 5G ProSe UE-to-network relay UE after M consecutive retransmissions of PROSE PC5 DISCOVERY message for UE-to-network relay discovery solicitation used to trigger the PROSE PC5 DISCOVERY message signal strength measurement between the UE and the 5G ProSe UE-to-network relay UE with which the UE has a link established;

NOTE: The value of M is implementation specific and is less than or equal to the maximum number of retransmissions allowed for PC5 signalling protocol.

h) the UE has received a PROSE DIRECT LINK ESTABLISHMENT REJECT message from the ProSe UE-to-network relay UE with the cause value #13 "congestion situation";

i) the UE has received a PROSE DIRECT LINK RELEASE REQUEST message from the ProSe UE-to-network relay UE with the cause value #13 "congestion situation"; or

j) the UE has received a PROSE DIRECT LINK ESTABLISHMENT REJECT message from the 5G ProSe UE-to-network relay UE with the cause value #15 "security procedure failure of 5G ProSe UE-to-network relay".

In cases c), d), h) and i), the 5G ProSe remote UE shall exclude the 5G ProSe UE-to-network relay UE which sent the message specified in cases c), d), h) or i) from the UE-to-network relay reselection process described below (at least for the indicated back-off time period if provided from the ProSe UE-to-network relay UE in cases h) and i)).

To conduct UE-to-network relay reselection process, the UE shall first initiate one of the following procedures or both depending on UE's configuration parameters for 5G ProSe UE-to-network relay as specified in clause 5.2.5:

a) monitoring procedure for UE-to-network relay discovery as specified in clause 8.2.1.2.2; or

b) discoverer procedure for UE-to-network relay discovery as specified in clause 8.2.1.3.1.

After the execution of the above discovery procedure(s), the 5G ProSe remote UE performs the UE-to-network relay selection procedure as specified in clause 8.2.2.

\*\*\*END OF CHANGES\*\*\*