**3GPP TSG-CT WG1 Meeting #123-eC1-202116**

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

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **24.587** | **CR** | **0008** | **rev** | **-** | **Current version:** | **16.0.0** |  |
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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:***  | L2 ID of target UE used with the direct link establishment request message |
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| ***Source to WG:*** | OPPO |
| ***Source to TSG:*** | C1 |
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| ***Work item code:*** | eV2XARC |  | ***Date:*** | 2020-4-2 |
|  |  |  |  |  |
| ***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-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
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| ***Reason for change:*** | Based on the agreed S2-1910019, approved in SA#86 and introduced into TS 23.287 v16.1.0, when initiating UE knows the L2 ID of the target UE, identified by the same Application layer ID, the initiating UE can reuse this L2 ID to request the direct link establishment. The corresponding contexts from TS 23.287 are highlighted as the following.5.6.1.4 Identifiers for unicast mode V2X communication over PC5 reference pointFor unicast mode of V2X communication over PC5 reference point, the destination Layer-2 ID used depends on the communication peer. The Layer-2 ID of the communication peer, identified by the Application Layer ID, may be discovered during the establishment of the PC5 unicast link, or known to the UE via prior V2X communications, e.g. existing or prior unicast link to the same Application Layer ID, or obtained from application layer service announcements. The initial signalling for the establishment of the PC5 unicast link may use the known Layer-2 ID of the communication peer, or a default destination Layer-2 ID associated with the service type (e.g. PSID/ITS-AID) configured for PC5 unicast link establishment, as specified in clause 5.1.2.1. During the PC5 unicast link establishment procedure, Layer-2 IDs are exchanged, and should be used for future communication between the two UEs, as specified in clause 6.3.3.1.Also in subclause 6.3.3.1:The source Layer-2 ID and destination Layer-2 ID used to send the Direct Communication Request message are determined as specified in clauses 5.6.1.1 and 5.6.1.4. The destination Layer-2 ID may be broadcast or unicast Layer-2 ID. When unicast Layer-2 ID is used, the Target User Info shall be included in the Direct Communication Request message.The corresponding stage 3 description is missing in the current TS 24.587.Also, considering the validity of the L2 ID of target UE, the initiating UE should check whether L2 ID of the target UE is still valid before sending the direct link establishment request, if the UE gets the target UE's L2 ID based on the prior unicast mode V2X communication.One possible way is that the target UE's L2 ID is associated with a validity timer. This timer starts at the initiating UE gets the L2 ID.Additinally, the description in subclause 6.1.2.2.4: "From this time onward the initiating UE shall use the established link for V2X communication over PC5 and additional PC5 signalling messages to the target UE." is not cerrect anymore since the link identifier can be upated. |
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| ***Summary of change:*** | 1. Add the initiating UE reuses the same L2 ID of the target UE identified with the same Application layer ID, if the L2 ID is still valid.2. the pair of the layer 2 IDs can be used before it is updated. |
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| ***Consequences if not approved:*** | 1. Using the target UE's layer 2 ID for direct link establishment request is missing;2. The current description on the period of using layer 2 ID is not cerrect in subclause 6.1.2.2.4. |
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| ***Clauses affected:*** | 6.1.2.2.2, 6.1.2.2.4 |
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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 \* \* \* \*

##### 6.1.2.2.2 PC5 unicast link establishment procedure initiation by initiating UE

Editor’s note: This section needs to be revisited after SA3 have determined the full set of security requirements for unicast link establishment.

The initiating UE shall meet the following pre-conditions before initiating this procedure:

a) a request from upper layers to transmit the packet for V2X service over PC5;

b) the link layer identifier for the initiating UE (i.e. layer 2 ID used for unicast communication) is available (e.g. pre-configured or self-assigned);

c) at least one of the following link layer identifier is available to the initiating UE:

1) the link layer identifier for the unicast initial signaling (i.e. destination layer 2 ID used for unicast initial signaling) is available to the initiating UE (e.g. pre-configured, obtained as specified in clause 5.2.3 or known via prior V2X communication); or

2) the link layer identifier for the target UE is available to the initiating UE (e.g. via prior V2X communication, or obtained from the application layer). The link layer identifier for the target UE is considered as valid:

i) if the link layer identifier for the target UE is also provided from the upper layers; or

ii) if the validity timer of the link layer identifier for the target UE has not expired;

NOTE: When both link layer identifiers are available, which one to use is up to UE implementation.

Editor's note: how UE gets the validity timer of the link layer identifier is FFS.

d) the initiating UE is either authorised for V2X communication over PC5 in NR in the serving PLMN, or has a valid authorization for V2X communication over PC5 in NR when not served by E-UTRAN and not served by NR; and

e) there is no existing PC5 unicast link for the pair of peer application layer IDs and the network layer protocol of this PC5 unicast link are identical to those required by the upper layer in the initiating UE for this V2X service.

In order to initiate the PC5 unicast link establishment procedure, the initiating UE shall create a DIRECT LINK ESTABLISHMENT REQUEST message. The initiating UE:

a) shall include the source user info set to the initiating UE’s application layer ID received from upper layers;

b) shall include the V2X service identifier received from upper layer;

c) may include the target user info set to the target UE’s application layer ID if received from upper layers or shall include the the target user info set to the target UE’s application layer ID if received from upper layers and the link layer identifier for the target UE is used; and

d) shall include the security establishment information.

Editor’s note: The parameters in the security establishment information will be defined by SA3.

After the DIRECT LINK ESTABLISHMENT REQUEST 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 either the destination layer 2 ID used for unicast initial signaling or the target UE's destination layer 2 ID, and start timer T5000. The UE shall not send a new DIRECT LINK ESTABLISHMENT REQUEST message to the same target UE identified by the same application layer ID while timer T5000 is running.



Figure 6.1.2.2.2: PC5 unicast link establishment procedure

\* \* \* Second Change \* \* \* \*

##### 6.1.2.2.4 PC5 unicast link establishment procedure completion by the initiating UE

Upon receipt of the DIRECT LINK ESTABLISHMENT ACCEPT message, the initiating UE shall stop timer T5000 and store the source layer-2 ID and the destination Layer-2 ID used in the transport of this message provided by the lower layers. This pair of layer-2 IDs shall be associated with a PC5 unicast link context until this pair of layer 2 IDs is changed during the PC5 unicast link identifier update procedure specified in subclause 6.1.2.5. From this time onward the initiating UE shall use the established link for V2X communication over PC5 and additional PC5 signalling messages to the target UE.

\* \* \* End of Changes \* \* \* \*