**3GPP TSG-CT WG1 Meeting #125-eC1-205309**

**Electronic meeting, 20-28 August 2020 (was 205017)**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **24.587** | **CR** | 0106 | **rev** | **1** | **Current version:** | **16.1.1** |  |
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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:*** | Removal of resolved ENs for PC5 unicast security | | | | | | | | | |
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| ***Source to WG:*** | Qualcomm Incorporated, Huawei | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eV2XARC | | | | |  | ***Date:*** | | | 2020-07-24 |
|  |  | | | |  | |  | | |  |
| ***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)* | |
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| ***Reason for change:*** | | The specification contains the following editor’s note under clause 6.1.1, quote:  Editor’s note: Further details about securing V2X communication over PC5 will be added as soon as SA3 conclude their study in 3GPP TR 33.836 and add necessary requirements in Rel-16.  under clause 6.1.2.2.2, quote:  Editor’s note: This section needs to be revisited after SA3 have determined the full set of security requirements for unicast link establishment.  under clause 6.1.2.7.1, quote:  Editor’s note: It is FFS whether the user plane is protected by the security association.  However, the specification already contains the security requirements from SA3, i.e., TS 33.536. Hence, there is not need of keeping the editor’s note and even less based on the TR 33.836. Security requirements for V2X communication already are part of the specification as matter of fact. | | | | | | | | |
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| ***Summary of change:*** | | Remove Editor’s Note related with SA3 | | | | | | | | |
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| ***Consequences if not approved:*** | | Unnecessary issue will remain in the specification. | | | | | | | | |
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| ***Clauses affected:*** | | 6.1.1, 6.1.2.2.2, 6.1.2.7.1 | | | | | | | | |
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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:*** | |  | | | | | | | | |
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| ***This CR's revision history:*** | |  | | | | | | | | |

\*\*\*\*\* First change \*\*\*\*\*

### 6.1.1 General

This clause describes the procedures at the UE, and between UEs, for V2X communication over PC5.

The UE shall support requirements for securing V2X communication over PC5.

Both IP based and non-IP based V2X communication over PC5 are supported. For IP based V2X communication, only IPv6 is used. IPv4 is not supported in this release of the present document.

V2X messages carried over PC5 are exchanged using user plane and they can be sent or received over broadcast, unicast or groupcast depending on whether the user equipment (UE) is using the new radio (NR-PC5) or the evolved universal terrestrial radio access (E-UTRA-PC5).

V2X communication over NR-PC5 supports broadcast mode, groupcast mode, and unicast mode. If upper layer of the UE indicates the mode of communication, the UE shall set the mode of communication based on the request of the upper layer. Otherwise, the UE shall set the mode of communication based on the mapping rules between the V2X service identifier and the default mode of communication defined in subclause 5.2.3.

NOTE: Further details about whether broadcast, unicast or groupcast can be used over PC5 are described in 3GPP TS 23.287 [3] clause 5.2.1.

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

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

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 communication mode is unicast mode (e.g. pre-configured as specified in clause 5.2.3 or indicated by upper layers);

c) 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) and is not being used by other existing PC5 unicast links within the initiating UE;

d) 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);

NOTE: In the case where different V2X services are mapped to distinct default destination layer-2 IDs, when the initiating UE intends to establish a single unicast link that can be used for more than one V2X service types, the UE can select any of the default destination layer-2 ID for unicast initial signalling.

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

f) there is no existing PC5 unicast link for the pair of peer application layer IDs, or there is an existing PC5 unicast link for the pair of peer application layer IDs and the network layer protocol of the existing PC5 unicast link is not identical to the network layer protocol required by the upper layer in the initiating UE for this V2X service.

g) the number of established PC5 unicast links is less than the implementation-specific maximum number of established NR PC5 unicast links allowed in the UE at a time.

After receiving the service data or request from the upper layers, the initiating UE shall derive the PC5 QoS parameters and assign the PQFI(s) for the PC5 QoS flows(s) to be established as specified in clause 6.1.2.12.

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(s) received from upper layer;

c) shall include the target user info set to the target UE’s application layer ID if received from upper layers;

d) shall include the Key establishment information container if the UE PC5 unicast signalling integrity protection policy is set to "signalling integrity protection required" or "signalling integrity protection preferred", and may include the Key establishment information container if the UE PC5 unicast signalling integrity protection policy is set to "signalling integrity protection not needed";

NOTE 1: The Key establishment information container is provided by upper layers.

e) shall include a Nonce\_1 set to the 128-bit nonce value generated by the initiating UE for the purpose of session key establishment over this PC5 unicast link if the UE PC5 unicast signalling integrity protection policy is set to "signalling integrity protection required" or "signalling integrity protection preferred";

f) shall include its UE security capabilities indicating the list of algorithms that the initiating UE supports for the security establishment of this PC5 unicast link;

g) shall include the 8 MSBs of KNRP-sess ID chosen by the initiating UE as specified in 3GPP TS 33.536 [20] if the UE PC5 unicast signalling integrity protection policy is set to "signalling integrity protection required" or "signalling integrity protection preferred";

h) may include a KNRP ID if the initiating UE has an existing KNRP for the target UE; and

i) shall include its UE PC5 unicast signalling security policy.

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 the destination layer-2 ID used for unicast initial signaling, 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.

NOTE 2: In order to ensure successful PC5 unicast link establishment, T5000 should be set to a value larger than the sum of T5006 and T5007.



Figure 6.1.2.2.2: PC5 unicast link establishment procedure

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

##### 6.1.2.7.1 General

The PC5 unicast link security mode control procedure is used to establish security between two UEs during a PC5 unicast link establishment procedure or a PC5 unicast link re-keying procedure. After successful completion of the PC5 unicast link security mode control procedure, the selected security algorithms and keys are used to integrity protect and cipher all PC5 signalling messages exchanged over this PC5 unicast link between the UEs and the security context can be used to protect all PC5 user plane data exchanged over this PC5 unicast link between the UEs. The UE sending the DIRECT LINK SECURITY MODE COMMAND message is called the "initiating UE" and the other UE is called the "target UE".

\*\*\*\*\* End of change \*\*\*\*\*