**3GPP TSG-CT WG1 Meeting #128-eC1-21xxxx wasC1-210859**

**Electronic meeting, 25 February – 5 March 2021**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **24.587** | **CR** | **0172** | **rev** | **1** | **Current version:** | **17.0.0** |  |
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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 | **x** |

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|  |
| ***Title:***  | One or more V2X service identifiers |
|  |  |
| ***Source to WG:*** | CATT |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | TEI17, eV2XARC |  | ***Date:*** | 2021-02-04 |
|  |  |  |  |  |
| ***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-12 (Release 12)Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)* |
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| ***Reason for change:*** | 1. There are possibly multiple V2X service identifers for a PC5 QoS flow context and V2X packet filter.
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| ***Summary of change:*** | 1. The V2X service indentifier is changed to V2X service identifier(s)
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| ***Consequences if not approved:*** | 1. Miss some cases that there are multiple V2X service identifiers.
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|  |  |
| ***Clauses affected:*** | 6.1.2.2.12, 6.1.2.13, 6.1.2.3.2, 6.1.3.2.1.2 |
|  |  |
|  | **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:*** |  |

\*\*\*\*\* change \*\*\*\*\*

#### 6.1.2.12 PC5 QoS flow establishment over PC5 unicast link

In order to establish a PC5 QoS flow establishment over PC5 unicast link, the UE shall derive the PC5 QoS parameters based on the V2X application requirements provided by the upper layers (if available) and the V2X service identifier(s) (e.g. PSID or ITS-AID) according to the PC5 QoS mapping rules defined in clause 5.2.3. The UE shall create the PC5 QoS flow(s) based on the derived PC5 QoS parameters. For each PC5 QoS flow to be created, the UE shall perform the following operations:

a) self-assign a PQFI;

b) create a PC5 QoS flow context, which contains:

1) the PQFI;

2) the V2X service identifier(s); and

3) the derived PC5 QoS parameters;

c) create a new PC5 QoS rule which contains:

1) a PC5 QoS rule identifier;

2) the PQFI;

3) a set of packet filters; and

4) a precedence value; and

d) pass the following parameters to the lower layers:

1) the PQFI;

2) the PC5 QoS parameters;

3) the PC5 link identifier; and

4) optionally, the source and destination layer-2 IDs.

\*\*\*\*\* change \*\*\*\*\*

#### 6.1.2.13 PC5 QoS flow match over PC5 unicast link

When service data or request from the upper layers is received, the UE determines if there is any existing PC5 QoS flow(s) matching the service data or request, i.e. based on the PC5 QoS rules for the existing PC5 QoS flow(s).

If there is no PC5 QoS rules for the existing PC5 QoS flow(s) matching the service data or request, the UE shall derive the PC5 QoS parameters based on the V2X application requirements provided by the upper layers (if available) and the V2X service identifier(s) (e.g. PSID or ITS-AID) according to the PC5 QoS mapping rules defined in clause 5.2.3 and shall perform the following:

a) if there is no existing PC5 QoS flow that fulfils the derived PC5 QoS parameters, then the UE shall create a new PC5 QoS flow as specified in clause 6.1.2.12;

b) if there is an existing PC5 QoS flow that fulfils the derived PC5 QoS parameters, then the UE shall update the PC5 packet filter set in the PC5 QoS rule of this PC5 QoS flow, e.g. add the new packet filter in the PC5 QoS rule of this existing PC5 QoS flow; and

c) the UE shall use the new PC5 QoS flow created as described in bullet a) or the existing PC5 QoS flow with the updated PC5 QoS rules as described in bullet b) to perform the transmission of V2X communication over PC5 as specified in clause 6.1.2.9.

If there is a PC5 QoS rule for the existing PC5 QoS flow matching the service data or request, the UE shall use this existing PC5 QoS flow to perform transmission of V2X communication over PC5 as specified in clause 6.1.2.9.

\*\*\*\*\* change \*\*\*\*\*

##### 6.1.2.3.2 PC5 unicast link modification procedure initiated by initiating UE

The initiating UE shall meet the following pre-conditions before initiating this procedure for adding a new V2X service to the existing PC5 unicast link:

a) there is a PC5 unicast link between the initiating UE and the target UE; and

b) the pair of application layer IDs and the network layer protocol of this PC5 unicast link are identical to those required by the application layer in the initiating UE for this V2X service.

c) the security policy corresponding to the V2X service identifier(s) (e.g. ITS-AID of the new V2X service) is aligned with the security policy of the existing PC5 unicast link.

After receiving the service data or request from the upper layers, the initiating UE shall perform the PC5 QoS flow match as apecified in clause 6.1.2.13. If there is no matched PC5 QoS flow, 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.

If the PC5 unicast link modification procedure is to add new PC5 QoS flow(s) to the existing PC5 unicast link, the initiating UE shall create a DIRECT LINK MODIFICATION REQUEST message. In this message, initiating UE:

a) shall include the PQFI(s) and the corresponding PC5 QoS parameters, including the V2X service identifier(s); and

b) shall include the link modification operation code set to "add new PC5 QoS flow(s) to the existing PC5 unicast link ".

If the PC5 unicast link modification procedure is to modify the PC5 QoS parameters for existing PC5 QoS flow(s) in the existing PC5 unicast link, the initiating UE shall create a DIRECT LINK MODIFICATION REQUEST message. In this message, the initiating UE:

a) shall include the PQFI(s) and the corresponding PC5 QoS parameters, including the V2X service identifier(s); and

b) shall include the link modification operation code set to "modify PC5 QoS parameters of the existing PC5 QoS flow(s)".

If the PC5 unicast link modification procedure is to associate new V2X service(s) with existing PC5 QoS flow(s), the initiating UE shall create a DIRECT LINK MODIFICATION REQUEST message. In this message, the initiating UE:

a) shall include the PQFI(s) and the corresponding PC5 QoS parameters, including the V2X service identifier(s); and

b) shall include the link modification operation code set to "associate new V2X service(s) with existing PC5 QoS flow(s)".

If the PC5 unicast link modification procedure is to remove the associated V2X service(s) from existing PC5 QoS flow(s), the initiating UE shall create a DIRECT LINK MODIFICATION REQUEST message. In this message, the initiating UE:

a) shall include the PQFI(s) and the corresponding PC5 QoS parameters including the V2X service identifier(s); and

b) shall include the link modification operation code set to "remove V2X service(s) from existing PC5 QoS flow(s)".

If the PC5 unicast link modification procedure is to remove any PC5 QoS flow(s) from the existing PC5 unicast link, the initiating UE shall create a DIRECT LINK MODIFICATION REQUEST message. In this message, the initiating UE:

a) shall include the PQFI(s); and

b) shall include the link modification operation code set to "remove existing PC5 QoS flow(s) from the existing PC5 unicast link".

After the DIRECT LINK MODIFICATION 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 target UE's layer-2 ID for unicast communication, and start timer T5001. The UE shall not send a new DIRECT LINK MODIFICATION REQUEST message to the same target UE while timer T5001 is running.



Figure 6.1.2.3.2: PC5 unicast link modification procedure

\*\*\*\*\* change \*\*\*\*\*

###### 6.1.3.2.1.2 PC5 QoS flow match and establishment

When determining if any existing PC5 QoS flow match the request from upper layers, UE shall proceeds as follows:

a) according to the PC5 QoS mapping rules specified in clause 5.2.3, the UE shall use the PC5 QoS parameters corresponding to the V2X service identifier and optionally V2X application requirements;

b) according to the V2X service identifier to destination layer-2 ID for broadcast mapping rules specified in clause 5.2.3, the UE shall use the destination layer-2 ID corresponding to the V2X service identifier;

c) if there is no existing context for the destination layer-2 ID, then:

1) build a new context for the destination layer-2 ID;

2) self-assign a new source layer-2 ID; and

3) pass the source layer-2 ID and the destination layer-2 ID to lower layers.

d) if in the context for the destination layer-2 ID, there is no PC5 QoS rule for the existing PC5 QoS flow(s) matching the service data or request, the UE shall derive the PC5 QoS parameters based on the V2X application requirements provided by the upper layers (if available) and the V2X service identifier(s) (e.g. PSID or ITS-AID) according to the PC5 QoS mapping rules defined in clause 5.2.3 and shall perform the following::

1) if there is no existing PC5 QoS flow that fulfils the derived PC5 QoS parameters, then the UE shall create a new PC5 QoS flow by performing the following operations:

i) self-assign a new PQFI;

ii) create a new PC5 QoS flow context which contains:

- the PQFI;

- the V2X service identifier(s); and;

- the derived PC5 QoS parameters;

iii) create a new PC5 QoS rule which contains:

- a PC5 QoS rule identifier;

- the PQFI;

- a set of packet filters; and

- a precedence value; and

iv) pass the following parameters to the lower layers:

- the PQFI;

- the PC5 QoS parameters; and

- the source layer-2 ID and the destination layer-2 ID;

2) if there is an existing PC5 QoS flow that fulfils the derived PC5 QoS parameters, then the UE shall update the PC5 packet filter set in the PC5 QoS rule of this PC5 QoS flow, e.g. add the new packet filter in the PC5 QoS rule of this existing PC5 QoS flow; and

3) the UE shall use the new PC5 QoS flow created as described in bullet 1) or the existing PC5 QoS flow with the updated PC5 QoS rules as described in bullet 2) to perform the transmission of V2X communication over PC5 as specified in clause 6.1.3.2.2; and

e) if in the context for the destination layer-2 ID, there is a PC5 QoS rule for the existing PC5 QoS flow matching the service data or request, the UE shall use this existing PC5 QoS flow to perform transmission of V2X communication over PC5 as specified in clause 6.1.3.2.2.

Two types of packet filters are supported for V2X communication over PC5, i.e. the IP packet filter set and the V2X packet filter set. A PC5 QoS Rule contains either the IP packet filter set or the V2X packet filter set.

The IP packet filter set is defined as content of the packet filter contents field specified in 3GPP TS 24.501 [6] figure 9.11.4.13.4 and table 9.11.4.13.1.

The V2X packet filter set shall support packet filters based on at least any combination of:

- V2X service identifier (e.g. PSID or ITS-AID);

- the source layer-2 ID and the destination layer-2 ID; and

- Application Layer ID (e.g. Station ID);

\*\*\*\*\* change \*\*\*\*\*