**3GPP TSG-CT WG1 Meeting #133-eC1-21xxxx**

**E-meeting, 11-19 November 2021**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
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|  | **24.587** | **CR** | **0222** | **rev** | **-** | **Current version:** | **17.3.0** |  |
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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:***  | Providing the NR Tx Profile for NR PC5 to lower layers |
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| ***Source to WG:*** | Nokia, Nokia Shanghai Bell |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | eV2XARC\_Ph2 |  | ***Date:*** | 2021-10-27 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
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| ***Reason for change:*** | The NR Tx Profile is needed by lower layers to determine whether the DRX operation for broadcast and groupcast modes for V2X communication over PC5.is needed or not, as specified in stage-2 V2X spec TS 23.287 with the CR 0165 (S2-2107841).Thus, the NR Tx Profile shall be provided from V2X layer to lower layers together with the layer-2 IDs and the PC5 QoS parameters. This is done for both the Transmitting UE and the Receiving UE as indicated in S2-2107841, and for both Broadcast mode and groupcast mode.This CR specifies all these aspects into stage-3 V2X spec.It is worth to note that, no changes are introduced in the clauses/subclauses of the groupcast mode (clause 6.1.4 and its subclauses) because those subclauses refer to the subclauses of the broadcast mode in 6.1.3 where the changes are done. |
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| ***Summary of change:*** | 1- For Transmitting UE in broadcast mode:a- Specifying that, the NR Tx Profile shall be provided to lower layers together with the Source/Destination layer-2 IDs and the PC5 QoS parameters.b- Specifying that, the lower layers determine whether the PC5 DRX operation is needed based on the provided NR Tx Profile.2- For Receiving UE in broadcast mode:a- specifying that, the NR Tx Profile shall be provided to lower layers together with the Destination layer-2 IDs and the PC5 QoS parameters.b- Specifying that, the lower layers determine whether the PC5 DRX operation is needed based on the provided NR Tx Profile. |
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| ***Consequences if not approved:*** | No possibility for lower layers to determine whether the PC5 DRX operation is needed as the NR Tx Profile is not provided to lower layers. |
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| ***Clauses affected:*** | 6.1.3.2.1.2, 6.1.3.3 |
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|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS 23.287 CR 0165 (S2-2107841) |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

\*\*\*\*\* First 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;

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

- the NR Tx Profile, if available, as determined for the respective V2X service identifier based on the configuration parameters and conditions described in clause 5.2.3;

NOTE: When the PC5 DRX operation is needed based on the provided NR Tx Profile, the lower layers use PC5 QoS parameters to determine the PC5 DRX parameter values for transmission operation over PC5 reference point.

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);

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

#### 6.1.3.3 Reception of broadcast mode V2X communication over PC5

The UE may be configured by upper layers with one or more destination layer-2 ID(s) for reception of V2X messages over PC5. The receiving UE shall determine the PC5 QoS parameters for this broadcast V2X service in the same way described in clause 6.1.3.2.1.2 and shall determine the NR Tx Profile as described in clause 5.2.3, and shall provide the PC5 QoS parameters, the NR Tx Profile if available and the destination layer-2 ID(s) to lower layers. For each received protocol data unit over PC5, the receiving UE shall check if the destination layer-2 ID of the received protocol data unit matches one of the configured destination Layer-2 IDs. If yes, the UE shall then check whether the protocol data unit type as defined 3GPP TS 38.323 [10] provided by the lower layers for the received packet is set to IP packet or non-IP packet, and pass the protocol data unit to the corresponding upper layer entity.

NOTE: When the PC5 DRX operation is needed based on the provided NR Tx Profile if any, the lower layers use PC5 QoS parameters to determine the PC5 DRX parameter values for reception operation over PC5 reference point.

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