**3GPP TSG-RAN WG2 Meeting #113bis-e R2-210xxxx**

**E-meeting, 12 – 20 April 2021**

**Title: [DRAFT]** LS on R16 V2X for PUCCH reporting and for minimum time gap

**Response to:**

**Release:** Rel-16

**Work Item:** 5G\_V2X\_NRSL

**Source:** OPPO [To be RAN2]

**To:** RAN1

**Cc:**

**Contact Person:**

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**Attachments:**

**1. Overall Description:**

In the current MAC specification TS 38.321, it is captured that

5.22.1.3.1a Sidelink process

[…]

2> if *sl-PUCCH-Config* is configured by RRC for the stored sidelink grant:

3> determine transmission of an acknowledgement on the PUCCH as specified in clause 5.22.1.3.2.

5.22.1.3.2 PSFCH reception

[…]

If *sl-PUCCH-Config* is configured by RRC, the MAC entity shall for a PUCCH transmission occasion:

1> if the *timeAlignmentTimer*, associated with the TAG containing the Serving Cell on which the HARQ feedback is to be transmitted, is stopped or expired:

[…]

1> else if a MAC PDU has been obtained for a sidelink grant associated to the PUCCH transmission occasion in clause 5.22.1.3.1, the MAC entity shall:

2> if the most recent transmission of the MAC PDU was not prioritized as specified in clause 5.22.1.3.1a:

[…]

2> else if HARQ feedback has been disabled for the MAC PDU and **next retransmission(s) of the MAC PDU is not required**:

3> instruct the physical layer to signal a positive acknowledgement corresponding to the transmission on the PUCCH according to clause 16.5 of TS 38.213 [6].

2> else if HARQ feedback has been disabled for the MAC PDU and no sidelink grant is available for next retransmission(s) of the MAC PDU, if any:

3> instruct the physical layer to signal a negative acknowledgement corresponding to the transmission on the PUCCH according to clause 16.5 of TS 38.213 [6].

[…]

In RAN2#113-bis, RAN2 discussed how to interpret the “next retransmission(s) of the MAC PDU is not required” and reached the following agreement

When FB is disabled and if sl-CG-MaxTransNumList is NOT configured, UE judges “next retransmission(s) of the MAC PDU is not required” based on its implementation.

When FB is disabled, for CG, if sl-CG-MaxTransNumList is configured with a value not larger than the number of CG resources, when sl-CG-MaxTransNum is reached, UE assumes that next retransmission(s) of the MAC PDU is not required

And reached the following working assumption:

Working assumption: “UE assumes that next retransmission(s) of the MAC PDU is required when FB is disabled, for CG, if sl-CG-MaxTransNumList is configured with a value not larger than the number of CG resources, when sl-CG-MaxTransNum is not reached”

**Q1**: RAN2 respectfully requests RAN1 to provide feedback on the working assumption above in case of any concern.

Besides, in the current MAC specification TS 38.321, it is captured for mode 2 that

|  |
| --- |
| 5.22.1.2 TX resource (re-)selection check[…]1> if retransmission of a MAC PDU on the selected sidelink grant has been dropped by either sidelink congestion control as specified in clause 8.1.6 of TS 38.214 or de-prioritization as specified in clause 16.2.4 of TS 38.213 [6], clause 5.4.2.2 of TS 36.321 [22] and clause 5.4.2.2:2> remove the resource(s) from the selected sidelink grant associated to the Sidelink process, if the resource(s) of the selected sidelink grant is indicated for re-evaluation or pre-emption by the physical layer;2> randomly select the time and frequency resource from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7] for either the removed resource or the dropped resource, according to the amount of selected frequency resources, the selected number of HARQ retransmissions and the remaining PDB of either SL data available in the logical channel(s) by ensuring the minimum time gap between any two selected resources of the selected sidelink grant in case that PSFCH is configured for this pool of resources, and that a resource can be indicated by the time resource assignment of a SCI for a retransmission according to clause 8.3.1.1 of TS 38.212 [9]; |

i.e., the minimum time gap between any two selected resources of the selected sidelink grant is ensured as long as **PSFCH is configured for the pool** when the UE performs resource (re-)selection. The current text is specified considering that when the UE performs resource (re-)selection, it may not be able to predict the necessity of HARQ feedback until later when the MAC PDU is generated (as captured in TS 38.321 section 5.22.1.4.1.2). In other words, if the UE performing resource (re-)selection decides that there is no need for HARQ feedback and thus no need to secure minimum gap, but later when generating MAC PDU realizes that HARQ feedback is actually needed for the MAC PDU, it may not be possible to perform transmissions on that (re-)selected resource due to not satisfying the minimum time gap.

RAN2 understands that it is not aligned with RAN1 agreement made in RAN1 #100-e meeting and thus discussed the issue in RAN2#113, but with no consensus to change MAC specification to align with RAN1 agreement.

RAN1 #100e Agreements:

* + In Step 2, a UE ensures a minimum time gap Z = a + b between any two selected resources of a TB **where a HARQ feedback for the first of these resources is expected**
		- ‘a’ is a time gap between the end of the last symbol of the PSSCH transmission of the first resource and the start of the first symbol of the corresponding PSFCH reception determined by resource pool configuration and higher layer parameters of *MinTimeGapPSFCH* and *periodPSFCHresource*

‘b’ is a time required for PSFCH reception and processing plus sidelink retransmission preparation including multiplexing of necessary physical channels and any TX-RX/RX-TX switching time and is determined by UE implementation

**Q2**: RAN2 respectfully requests RAN1 to provide feedback in case of any concern on the MAC specification above.

**2. Actions:**

**To RAN1 group**

RAN2 respectfully requests RAN1 to provide feedback on Q1 and Q2 above in case of any concern.

**3. Date of Next TSG-RAN2 Meetings:**

3GPPRAN2#114-e 19-27 May 2021 Online

3GPPRAN2#115-e 16-27 August 2021 Online