**3GPP TSG RAN WG1 #108-e R1-21XXXXX**

**e-Meeting, February 21st - March 3rd**

**Source: Moderator (vivo)**

**Title: Summary of email discussion [108-e-R16-V2X-04] UE procedure for receiving HARQ-ACK on sidelink**

**Agenda item: 7.2.4**

**Document for:** **Discussion and Decision**

Introduction

This document is to summarize the discussion of the following email thread.

[108-e-R16-V2X-04] UE procedure for receiving HARQ-ACK on sidelink; considering [R1-2201073](../../Docs/R1-2201073.zip) (second change), [R1-2201074](../../Docs/R1-2201074.zip) by February 25 – Siqi (vivo)

Companies are highly appreciated providing your inputs before the 1st checkpoint:

* **1st checkpoint: 22th Feb 11:59 AM UTC**

Discussion

## Round 1

In RAN1#102 the following agreements were made, and in section 16.3.1 of TS 38.213, the following text in red is to capture the agreements for groupcast option1.

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| 16.3.1 UE procedure for receiving HARQ-ACK on sidelink A UE that transmitted a PSSCH scheduled by a SCI format 2-A or a SCI format 2-B that indicates HARQ feedback enabled, attempts to receive associated PSFCHs according to PSFCH resources determined as described in clause 16.3. The UE determines an ACK or a NACK value for HARQ-ACK information provided in each PSFCH resource as described in [8-4, TS 38.101-4]. The UE does not determine both an ACK value and a NACK value at a same time for a PSFCH resource.  For each PSFCH reception occasion, from a number of PSFCH reception occasions, the UE generates HARQ-ACK information to report to higher layers. For generating the HARQ-ACK information, the UE can be indicated by a SCI format to perform one of the following  - if the UE receives a PSFCH associated with a SCI format 2-A with Cast type indicator field value of "10"  - report to higher layers HARQ-ACK information with same value as a value of HARQ-ACK information that the UE determines from the PSFCH reception  - if the UE receives a PSFCH associated with a SCI format 2-A with Cast type indicator field value of "01"  - report an ACK value to higher layers if the UE determines an ACK value from at least one PSFCH reception occasion from the number of PSFCH reception occasions in PSFCH resources corresponding to every identity of UEs that the UE expects to receive corresponding PSSCHs as described in clause 16.3; otherwise, report a NACK value to higher layers  - if the UE receives a PSFCH associated with a SCI format 2-B or a SCI format 2-A with Cast type indicator field value of "11"  - report to higher layers an ACK value if the UE determines absence of PSFCH reception for the PSFCH reception occasion; otherwise, report a NACK value to higher layers |

Agreements:

* Prepare a TP to capture UE behavior that physical layer reports HARQ-ACK information of the received PSFCH to higher layer. Detailed wording will be discussed during the TP phase with the following principle:
  + Groupcast option 1: UE reports ACK when the UE determines absence of PSFCH reception for the PSFCH reception occasion; otherwise, reports NACK.
  + Groupcast option 2: UE reports ACK if the UE determines ACK in PSFCH resources corresponding to every identity M\_ID of the UEs that the UE expects to receive the PSSCH, as described in Clause 16.3; otherwise reports NACK;
  + Unicast: UE reports HARQ-ACK information with same value as a value of HARQ-ACK information the UE determines from the PSFCH reception
  + Discuss during the TP phase whether or not a clarification is necessary to separately handle the potential collision case if any

In [1], the following issue was identified:

* the first sentence **‘if UE receives a PSFCH**’ in the third bullet for groupcast option1 is contradictory with the condition ‘**if the UE determines absence of PSFCH reception**’ in the sub-bullet.

To address this issue, the following change is proposed in [1] for Rel-16, and the same change is proposed by [2] as a minor CR draft of Rel-17.

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| 16.3.1 UE procedure for receiving HARQ-ACK on sidelink A UE that transmitted a PSSCH scheduled by a SCI format 2-A or a SCI format 2-B that indicates HARQ feedback enabled, attempts to receive associated PSFCHs according to PSFCH resources determined as described in clause 16.3. The UE determines an ACK or a NACK value for HARQ-ACK information provided in each PSFCH resource as described in [8-4, TS 38.101-4]. The UE does not determine both an ACK value and a NACK value at a same time for a PSFCH resource.  For each PSFCH reception occasion, from a number of PSFCH reception occasions, the UE generates HARQ-ACK information to report to higher layers. For generating the HARQ-ACK information, the UE can be indicated by a SCI format to perform one of the following  - if the UE receives a PSFCH associated with a SCI format 2-A with Cast type indicator field value of "10"  - report to higher layers HARQ-ACK information with same value as a value of HARQ-ACK information that the UE determines from the PSFCH reception  - if the UE receives a PSFCH associated with a SCI format 2-A with Cast type indicator field value of "01"  - report an ACK value to higher layers if the UE determines an ACK value from at least one PSFCH reception occasion from the number of PSFCH reception occasions in PSFCH resources corresponding to every identity of UEs that the UE expects to receive corresponding PSSCHs as described in clause 16.3; otherwise, report a NACK value to higher layers  - for a PSFCH reception occasion associated with a SCI format 2-B or a SCI format 2-A with Cast type indicator field value of "11"  - report to higher layers an ACK value if the UE determines absence of PSFCH reception for the PSFCH reception occasion; otherwise, report a NACK value to higher layers |

**Q1: Do you agree with the issue identified in** **R1-2201073** [1]**?**

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| **Company** | **agree or not** | **Comment** |
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**Q2: If the answer to Q1 is yes, do you support the proposed change above? please provide comments as to whether the proposed change is acceptable or any suggested modifications.**

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| **Company** | **Support or not** | **Comment** |
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## Round 2 if needed

TBD

Summary

Reference

1. R1-2201073, ‘Draft CR on UE procedure for receiving HARQ-ACK on sidelink’, vivo
2. R1-2201074, ‘Draft CR on UE procedure for receiving HARQ-ACK on sidelink’, vivo