3GPP TSG RAN WG1 #105-e R1-210xxxx

**e-Meeting, May 10th – 27th, 2021**

Agenda Item: 7.2.4

Source: Moderator (Ericsson)

Title: Feature lead summary#1 on Resource allocation for NR sidelink Mode 1 – Thread 2

Document for: Discussion, Decision

# List of topics

**Group M1 – SL HARQ-ACK reports to gNB**

* **M1-1-1**: SL HARQ-ACK reporting when SL FB is not used (see CATT (P1-P3), OPPO (Section 2), Ericsson)
  + This topic is related to Q1 in the LS from RAN2 (R1-2104559) which is discussed in some contributions (see LGE (P2))
  + FL assessment: A correction is needed.
* **M1-1-2**: SL HARQ-ACK reporting when the UE does not perform SL transmission on the resources provided by a DG (see Fujitsu (P1), DCM (TP1))
  + FL assessment: This has been discussed in the past without consensus. A correction could be introduced but not everyone believes it is necessary. It can be discussed together with M1-1-1.
* **M1-1-3**: SL HARQ-ACK reporting when multiple pools are configured (see vivo (TP3), ZTE (P2), ASUSTeK (TP1))
  + FL assessment: There were objections to treat this in the preparation of the previous meeting, stating that this could be addressed through configuration. In any case, a correction of a clarification of the behaviour could be discussed.
* **M1-1-4**: SL HARQ-ACK reporting in an incomplete PSFCH period (see vivo (TP4), ZTE (P1))
  + FL assessment: There were objections to treat this in the preparation of the previous meeting, stating that this could be addressed through configuration.
* **M1-1-5**: Aspects related to PUCCH power control (see vivo (TP5))
  + FL assessment: a clarification seems necessary
* **M1-1-6**: k>0 in offset between PSFCH and HARQ-ACK reporting (see Sharp (TP3))
  + FL assessment: Not a critical correction.

**Group M2 – DCI-related aspects**

* **M1-2-1**: Value of n\_CI (see vivo (TP1))
  + FL assessment: looks like a necessary correction
* **M1-2-2**: DCI size alignment (see vivo (TP2))
  + FL assessment: It is not clear that there is an issue with the specification. in any case, the change is almost editorial.
* **M1-2-3**: Configuration index in DCI format 3\_0 for SL-CS-RNTI for retransmissions (see ASUSTeK (TP5), Sharp (TP1))
  + FL assessment: clarification looks ok, but it is not clear that there is any impact if not taken.
* **M1-2-4**: Search space overlapping between SL and Uu in the same carrier (LGE (P1))
  + FL assessment: it looks like the corresponding agreements have not been captured in the spec.

**Group M3 – Editorial corrections**

* **38.213**
  + Clause 10.2A: clarification of the CG validated (ASUSTeK (TP4))
  + Clause 16.5: Correct “One HARQ-ACK information bit” (Sharp (TP4))
    - FL assessment: The correction seems reasonable but it was discussed earlier without consensus.
* **38.214**
  + Clause 8.1.2: correct reference (ASUSTeK (TP3))
  + Clause 8.1.2.1:
    - Indicate how the “Configuration index” field is set (see ZTE (P5), ASUSTeK (TP3))
    - RRC parameter name alignment *timeGapFirstSidelinkTransmission* (ASUSTeK (TP3))
  + Clause 8.4.1.2.2 typo (see OPPO (TP3))

**Group M4 – TPs corresponding to agreements in previous meetings**

* TS 38.213 Clause 16.5: Agreement/LS from RAN1#104, reply LS received in R2-2104463 (see vivo (TP6), ZTE (P4), Nokia+NSB (P1), DCM (TP2))

A few contributions discuss topics like priorities of SL HARQ feedback that have been treated by other FLs in the past. There are also some proposed editorial corrections belonging to other AIs.

FL proposal:

* For a first thread: discuss M1-1-1.
* For a second thread: one of M1-2-1 or M1-1-3.

As agreed at the start of the meeting, the following related threads will be discussed:

[105-e-NR-5G\_V2X-02] Email discussion/approval regarding

* Issue M1-1-1: SL HARQ-ACK reporting when SL FB is not used (considering LS in [R1-2104559](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_105\Docs\R1-2104559.zip))

till 5/24 with any follow-up TPs till 5/26 – Ricardo (Ericsson)

[105-e-NR-5G\_V2X-03] Email discussion/approval regarding

* Issue M1-2-1: Value of n\_CI

till 5/24 with any follow-up TPs till 5/26 – Ricardo (Ericsson)

[105-e-NR-5G\_V2X-04] Email discussion/approval regarding

* Issue M1-4: TPs corresponding to agreements in previous meetings (Agreement/LS from RAN1#104, reply LS received in [R1-2104160](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_105\Docs\R1-2104160.zip), M1-2-2: DCI size alignment)

till 5/24 – Ricardo (Ericsson)

This document deals with issue M1-1-1.

# M1-1-1 SL HARQ-ACK reporting when SL FB is not used

## LS in R1-2104559

RAN2 has sent an LS to RAN1 with the following text related to Mode 1:

|  |  |  |  |
| --- | --- | --- | --- |
| 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. |

RAN2 requests RAN1 to provide feedback on Q1 above in case of concern.

This issue is discussed in the following contributions submitted to AI5:

* R1-2104641 Draft reply to RAN2 on minimum time gap Qualcomm Incorporated
* R1-2104753 Discussion on PUCCH reporting and for minimum time gap OPPO
  + R1-2104754 Draft reply LS on R16 V2X for PUCCH reporting and for minimum time gap OPPO
* R1-2104843 Discussion on the LS from RAN2 on PUCCH reporting and for minimum time gap CATT, GOHIGH
* R1-2104883 Draft reply LS on R16 V2X for PUCCH reporting and for minimum time gap Intel Corporation
* R1-2105282 Draft reply LS on R16 V2X for PUCCH reporting and for minimum time gap Samsung
* R1-2105449 Draft Reply LS on R16 V2X for PUCCH reporting and for minimum time gap vivo
* R1-2105899 Discussion on RAN2 LS on PUCCH reporting and for minimum time gap for V2X Ericsson
  + R1-2105898 [Draft] LS on PUCCH reporting and minimum time gap for V2X Ericsson
* R1-2105922 Discussion on HARQ feedback reporting and minimum time gap Huawei, HiSilicon

as well as some contributions submitted to AI 7.2.4, as listed above. Their positions on Q1 can be grouped as:

* No concern: R1-2104753, R1-2104843, R1-2104883, R1-2105282, R1-2105449, R1-2105922
* Concern: R1-2105202

The proposal of the FL would be to capture the following conclusion:

Proposed Conclusion:

* RAN1 has no concern with Q1 in the LS in R1-2104559.

Please share your views on the proposed conclusion using the table below.

|  |  |
| --- | --- |
| **Company** | **View** |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

Besides the LS, the topic of SL HARQ-ACK reporting when SL FB is not used is discussed in several contributions, as listed above. At least R1-2104750 and R1-2105896 argue that the necessary text to specify ‘SL HARQ-ACK reporting when SL HARQ feedback is not used’ is missing from TS 38.213. On this aspect:

* The priority of the HARQ-ACK report needs to be defined.
* The RAN2 specifications copied below (cf. LS from RAN2) already describe how to generate the contents (i.e., ACK/NACK) of the report. It does not seem to be necessary to capture this in RAN1 specifications too.

|  |
| --- |
| 5.22.1.3.2 PSFCH reception The MAC entity shall for each PSSCH transmission:  1> if an acknowledgement corresponding to the PSSCH transmission in clause 5.22.1.3.1a is obtained from the physical layer:  2> deliver the acknowledgement to the corresponding Sidelink HARQ entity for the Sidelink process;  1> else:  2> deliver a negative acknowledgement to the corresponding Sidelink HARQ entity for the Sidelink process;  1> if the PSSCH transmission occurs for a pair of Source Layer-2 ID and Destination Layer-2 ID corresponding to a PC5-RRC connection which has been established by upper layers:  2> perform the HARQ-Based Sidelink RLF Detection procedure as specified in clause 5.22.1.3.3.  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:  2> not instruct the physical layer to generate acknowledgement(s) of the data in this TB.  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:  3> instruct the physical layer to signal a negative acknowledgement 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 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].  2> else:  3> instruct the physical layer to signal an acknowledgement corresponding to the transmission on the PUCCH according to clause 16.5 of TS 38.213 [6]  1> else:  2> instruct the physical layer to signal a positive acknowledgement on the PUCCH according to clause 16.5 of TS 38.213 [6]. |

Based on this, the FL proposes to agree to the following conclusion to be used for preparing the corresponding CR:

Proposed conclusion:

* Capture in TS 38.213 Clause 16.5 the necessary text to specify the UE behaviour for reporting HARQ-ACK on uplink when SL feedback is disabled for a TB (as per existing agreements):
  + The contents of the HARQ-ACK report on uplink is provided by higher layer.
  + The priority value of the HARQ-ACK report is the same as the priority value of the corresponding PSSCH transmission(s).

Please share your views on the proposed conclusion using the table below. The FL’s intention is to discuss the CR once there is common understanding in this group about the issue and how to address it.

|  |  |
| --- | --- |
| **Company** | **View** |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

# Other

Please use the table below to share your views on other topics

|  |  |
| --- | --- |
| **Company** | **View** |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

# List of identified contributions

R1-2104477 Discussion and TP on Mode1 resource allocation CATT, GOHIGH

R1-2104750 Remaining open issues and corrections for mode 1 RA OPPO

R1-2105056 Maintenance for mode-1 resource allocation for NR sidelink Fujitsu

R1-2105202 Discussion on essential corrections in resource allocation procedure LG Electronics

R1-2105462 Maintenance on NR sidelink mode-1 resource allocation mechanism vivo

R1-2105611 Remaining issues on mode 1 ZTE, Sanechips

R1-2105627 Remaining issues on resource allocation for NR sidelink Sharp

R1-2105680 Maintenance for resource allocation mechanism mode 1 NTT DOCOMO, INC.

R1-2105740 Remaining issues on resource allocation mode-1 and sidelink procedure ASUSTeK

R1-2105896 Corrections to Mode 1 Ericsson

R1-2105943 Maintenance for Resource allocation for sidelink - Mode 1 Nokia, Nokia Shanghai Bell