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

**e-Meeting, May 10th – 27th, 2021**

**Source: Moderator (Intel Corporation)**

**Title: Feature lead summary on Mode-2 resource allocation maintenance issues in Rel.16 5G V2X**

**Agenda item: 7.2.4**

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

Introduction

This contribution provides a summary of proposed correction to Mode-2 sidelink resource allocation for NR-V2X communication, based on review of the submitted contributions [1]-[12]. Note, that the other contributions [13]-[39] do not seem to include Mode-2 issues.

Identification of email discussions

The following issues are assumed to be handled as separate threads as per procedures:

Issue M2-1 – TP to implement the agreement from [104b-e-NR-5G\_V2X-03]

* Since this is related to capturing the agreement from the previous meeting

Issue M2-5 – HARQ RTT time gap capturing issue in MAC – related to LS R1-2104559

* Since this is assumed to be handled as a reply LS in AI 5

It is proposed to organize the following email discussion(s):

* One of M2-2 or M2-6

Finally agreed threads:

TBD

Analysis of Draft Corrections

Issue M2-1 – TP to implement the agreement from [104b-e-NR-5G\_V2X-03]

* Issue of implementing the agreement made in [104b-e-NR-5G\_V2X-03]
* Needs discussion (assume it has a separate budget as per guidelines)

Issue M2-2 – Resource exclusion/selection for multiple transport blocks

* Discussed extensively w/o conclusion
* Can be re-discussed due to major interest (3 sources)

Issue M2-3 – Correction to step 6) to include slots within Tproc0

* Was discussed during the preparation in RAN1#104-e, but considered as an optimization
* Proponents insist there is still an issue
* Optimization at this stage

Issue M2-4 – Introduce a dropping condition when HARQ RTT time gap is not met

* Was not discussed
* Optimization at this stage

Issue M2-5 – HARQ RTT time gap capturing issue in MAC – related to LS R1-2104559

* To be discussed as part of LS reply
* Assume will be handled in AI 5 with separate email

Issue M2-6 – In TS 38.214, the subscripts of the notations $t'\_{m+q×P\_{rsvp\\_RX}^{'}}^{SL}$ and $R\_{x,y+j×P\_{rsvp\\_TX}^{'}}$should be changed into $t'\_{mod(m+q×P\_{rsvp\_{RX}}^{'},T^{'}\_{max})}^{SL}$ and $R\_{x,mod(y+j×P\_{rsvp\\_TX}^{'},T^{'}\_{max})} $respectively

* Was not discussed
* Can be discussed

Issue M2-7 – Exclude the slots with PSFCH when sl-LengthSymbols≤9 in the identification of candidate resources in the sensing procedure

* Was not discussed
* Optimization at this stage

Issue M2-8 – Clarification on timing relation between re-evaluation moment and initial selection moment

* Was not discussed
* Optimization at this stage

|  |  |  |
| --- | --- | --- |
| **Tdoc#** | **Issue within the tdoc** | **Issue index** |
| R1-2104194, FUTUREWEI | TP to implement the agreement from [104b-e-NR-5G\_V2X-03] | 1 |
| R1-2104751, OPPO | TP to implement the agreement from [104b-e-NR-5G\_V2X-03] | 1 |
| R1-2104887, Intel Corporation | TP to implement the agreement from [104b-e-NR-5G\_V2X-03] | 1 |
| R1-2105081, Apple | Resource exclusion/selection for multiple transport blocks | 2 |
| R1-2105252, NEC | Correction to step 6) to include slots within Tproc0 | 3 |
| R1-2105463, vivo | Introduce a dropping condition when HARQ RTT time gap is not met | 4 |
|  | HARQ RTT time gap capturing issue in MAC | 5 |
|  | TP to implement the agreement from [104b-e-NR-5G\_V2X-03] | 1 |
| R1-2105612, ZTE, Sanechips | TP to implement the agreement from [104b-e-NR-5G\_V2X-03] | 1 |
|  | In TS 38.214, the subscripts of the notations $t'\_{m+q×P\_{rsvp\\_RX}^{'}}^{SL}$ and $R\_{x,y+j×P\_{rsvp\\_TX}^{'}}$should be changed into $t'\_{mod(m+q×P\_{rsvp\_{RX}}^{'},T^{'}\_{max})}^{SL}$ and $R\_{x,mod(y+j×P\_{rsvp\\_TX}^{'},T^{'}\_{max})} $respectively | 6 |
|  | HARQ RTT time gap capturing issue in MAC | 5 |
| R1-2105627, Sharp | Exclude the slots with PSFCH when sl-LengthSymbols≤9 in the identification of candidate resources in the sensing procedure | 7 |
|  | Clarification on timing relation between re-evaluation moment and initial selection moment | 8 |
| R1-2105841, ASUSTeK | Resource exclusion/selection for multiple transport blocks | 2 |
| R1-2105897, Ericsson | TP to implement the agreement from [104b-e-NR-5G\_V2X-03] | 1 |
| R1-2105920, Huawei, HiSilicon | Resource exclusion/selection for multiple transport blocks | 2 |
| R1-2105944, Nokia, Nokia Shanghai Bell | TP to implement the agreement from [104b-e-NR-5G\_V2X-03] | 1 |

References

**Contributions identified by FL to contain Mode-2 related issues:**

1. R1-2104194 TP to address infinite loop due to excessive resource exclusion for Rel. 16 V2X FUTUREWEI
2. R1-2104751 Discussion on TPs for skipping step 5 in mode 2 RA OPPO
3. R1-2104887 Correction to sidelink resource identification procedure to prevent infinite loop issue – implementation of the agreement from [104b-e-NR-5G\_V2X-03] Intel Corporation
4. R1-2105081 On Remaining Issue of Mode 2 Resource Allocation Apple
5. R1-2105252 Remaining issues on resource allocation mode 2 NEC
6. R1-2105463 Maintenance on NR sidelink mode-2 resource allocation mechanism vivo
7. R1-2105612 Remaining issues on mode 2 ZTE, Sanechips
8. R1-2105627 Remaining issues on resource allocation for NR sidelink Sharp
9. R1-2105841 Remaining issues on sidelink mode 2 ASUSTeK
10. R1-2105897 Condition to stop the infinite loop for Mode 2 RA Ericsson
11. R1-2105920 Correction on resource exclusion for other TBs Huawei, HiSilicon
12. R1-2105944 Maintenance for Resource allocation for sidelink - Mode 2 Nokia, Nokia Shanghai Bell

**Other contributions**

1. R1-2104235 Remaining issues for sidelink physical layer procedure Huawei, HiSilicon
2. R1-2104477 Discussion and TP on Mode1 resource allocation CATT, GOHIGH
3. R1-2104478 Correction on SL HARQ-ACK report piggybacked on PUSCH CATT, GOHIGH
4. R1-2104649 Remaining Issues in physical layer procedure Qualcomm Incorporated
5. R1-2104750 Remaining open issues and corrections for mode 1 RA OPPO
6. R1-2104752 Remaining open issues and corrections for physical layer procedure OPPO
7. R1-2104890 Correction to PSFCH reception procedure for NACK-only case to mitigate half-duplex issue Intel Corporation
8. R1-2105056 Maintenance for mode-1 resource allocation for NR sidelink Fujitsu
9. R1-2105057 Maintenance for physical layer procedures for NR sidelink Fujitsu
10. R1-2105082 Maintenance of Sidelink Physical Layer Procedure Apple
11. R1-2105201 Discussion on essential corrections in physical layer procedure LG Electronics
12. R1-2105202 Discussion on essential corrections in resource allocation procedure LG Electronics
13. R1-2105210 Corrections for transmitting sidelink reference signals in TS 38.214 ETRI
14. R1-2105251 Remaining issues on physical layer structure NEC
15. R1-2105462 Maintenance on NR sidelink mode-1 resource allocation mechanism vivo
16. R1-2105464 Maintenance on NR sidelink synchronization and procedure vivo
17. R1-2105611 Remaining issues on mode 1 ZTE, Sanechips
18. R1-2105613 Miscellaneous corrections of TS38.212\_214 ZTE, Sanechips
19. R1-2105626 Remaining issues on physical layer structure for NR sidelink Sharp
20. R1-2105628 Remaining issues on synchronization mechanism and QoS management for NR sidelink Sharp
21. R1-2105680 Maintenance for resource allocation mechanism mode 1 NTT DOCOMO, INC.
22. R1-2105681 Maintenance for sidelink physical layer procedure NTT DOCOMO, INC.
23. R1-2105740 Remaining issues on resource allocation mode-1 and sidelink procedure ASUSTeK
24. R1-2105895 Corrections to SL procedures Ericsson
25. R1-2105896 Corrections to Mode 1 Ericsson
26. R1-2105921 Correction on PSSCH-DMRS time-domain OCC Huawei, HiSilicon
27. R1-2105943 Maintenance for Resource allocation for sidelink - Mode 1 Nokia, Nokia Shanghai Bell