**3GPP TSG RAN WG1 #104-bis-e R1-210xxxx**

**e-Meeting, April 12th – 20th, 2021**

**Source: Moderator (Intel Corporation)**

**Title: Feature lead summary on Mode-2 resource allocation 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

It is proposed to organize the following email discussion:

Issue M2-1 – Infinite loop due to excessive resource exclusion in step 5)

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

Finally agreed threads:

Issue list

Issue M2-1 – Infinite loop due to excessive resource exclusion in step 5)

* Discussed partially
* Can be re-discussed due to major interest (4 sources)

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

* Discussed extensively w/o conclusion
* Can be re-discussed due to major interest (4 sources)

Issue M2-5 – HARQ RTT time gap capturing issue in MAC, send LS

* Was not discussed in RAN1, but discussed in RAN2
* In preparation to the last meeting, we decided to gain support in RAN2 directly to fix this issue w/o sending LS
* Can be discussed in RAN1 if there is interest

Issue M2-6 – ‘sl-ThresPSSCH-RSRP-List’ to ‘sl-Thres-RSRP-List’ replacement

* New editorial issue due to RRC spec update
* Can be included into an editorial / alignment CR

Issue M2-10 – Replacing ‘sl-ResourceReservePeriod1’ by ‘sl-ResourceReservePeriodList’ in 213, clause 16.4

* New editorial issue
* Can be included into an editorial / alignment CR

Analysis of Draft Corrections

Issue M2-1 – Infinite loop due to excessive resource exclusion in step 5)

* Discussed partially
* Can be re-discussed due to major interest (4 sources)

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

* Discussed extensively w/o conclusion
* Can be re-discussed due to major interest (4 sources)

Issue M2-3 – Backward indication

* Discussed extensively
* 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, send LS

* Was not discussed in RAN1, but discussed in RAN2
* In preparation to the last meeting, we decided to gain support in RAN2 directly to fix this issue w/o sending LS
* Can be discussed in RAN1 if there is interest

Issue M2-6 – ‘sl-ThresPSSCH-RSRP-List’ to ‘sl-Thres-RSRP-List’ replacement

* New editorial issue due to RRC spec update
* Can be included into an editorial / alignment CR

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

Issue M2-9 – Correction to step 6) to include slots within Tproc0

* Was discussed during the preparation last time, but considered as an optimization
* Proponents insist there is still an issue
* Optimization at this stage

Issue M2-10 – Replacing ‘sl-ResourceReservePeriod1’ by ‘sl-ResourceReservePeriodList’ in 213, clause 16.4

* New editorial issue
* Can be included into an editorial / alignment CR

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| --- | --- | --- |
| **Tdoc#** | **Issue within the tdoc** | **Issue index** |
| R1-2102369 OPPO | Infinite loop due to excessive resource exclusion in step 5) | 1 |
| R1-2102589 CATT, GOHIGH | Resource exclusion/selection for multiple transport blocks | 2 |
|  | Backward indication | 3 |
| R1-2102941 vivo | Introduce a dropping condition when HARQ RTT time gap is not met | 4 |
|  | HARQ RTT time gap capturing issue in MAC, send LS | 5 |
|  | ‘sl-ThresPSSCH-RSRP-List’ to ‘sl-Thres-RSRP-List’ replacement | 6 |
| R1-2103081 Apple | Resource exclusion/selection for multiple transport blocks | 2 |
|  | Infinite loop due to excessive resource exclusion in step 5) | 1 |
| R1-2103143 Qualcomm | Infinite loop due to excessive resource exclusion in step 5) | 1 |
| R1-2103467 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 |
| R1-2103501 ZTE, Sanechips | ‘sl-ThresPSSCH-RSRP-List’ to ‘sl-Thres-RSRP-List’ replacement | 6 |
| R1-2103516 NEC | Correction to step 6) to include slots within Tproc0 | 9 |
| R1-2103639 ASUSTeK | Resource exclusion/selection for multiple transport blocks | 2 |
| R1-2103750 Huawei, HiSilicon | Resource exclusion/selection for multiple transport blocks | 2 |
| R1-2103751 Huawei, HiSilicon | Infinite loop due to excessive resource exclusion in step 5) | 1 |
| R1-2103765 Nokia, Nokia Shanghai Bell | replacing ‘sl-ResourceReservePeriod1’ by ‘sl-ResourceReservePeriodList’ in 213, clause 16.4 | 10 |

References

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

1. R1-2102369 Remaining open issues and corrections for mode 2 RA OPPO
2. R1-2102589 Discussion and TPs on resource allocation in NR V2X CATT, GOHIGH
3. R1-2102941 Maintenance on NR sidelink mode-2 resource allocation mechanism vivo
4. R1-2103081 On Remaining Issues of Mode 2 Resource Allocation Apple
5. R1-2103143 Remaining Issues in Mode 2 Resource Allocation Qualcomm Incorporated
6. R1-2103467 Remaining issues on resource allocation for NR sidelink Sharp
7. R1-2103501 Draft CR of TS38.214 ZTE, Sanechips
8. R1-2103516 Remaining issues on resource allocation mode 2 NEC
9. R1-2103639 Remaining issues on sidelink mode 2 ASUSTeK
10. R1-2103750 Correction on resource exclusion for other TBs Huawei, HiSilicon
11. R1-2103751 Correction on step 5 of mode 2 resource allcoation Huawei, HiSilicon
12. R1-2103765 Maintenance for Resource allocation for sidelink - Mode 2 Nokia, Nokia Shanghai Bell

**Other contributions**

1. R1-2102368 Remaining open issues and corrections for mode 1 RA OPPO
2. R1-2102590 Discussion and TPs on Tie-break issues for PSFCH Tx and PSFCH Rx CATT, GOHIGH
3. R1-2102591 Discussion on timing offset between eNB and gNB in NR V2X CATT, GOHIGH
4. R1-2102710 A remaining issue on Mode-1 resource allocation for NR sidelink Fujitsu
5. R1-2102711 Remaining issues on physical layer procedures for NR sidelink Fujitsu
6. R1-2102795 Remaining open issues and corrections for procedure OPPO
7. R1-2102940 Maintenance on NR sidelink mode-1 resource allocation mechanism vivo
8. R1-2102942 Maintenance on NR sidelink synchronization and procedure vivo
9. R1-2103080 On Remaining Issue of Sidelink Physical Layer Procedures Apple
10. R1-2103213 Discussion on Issues for NR Sidelink Physical Layer Structure Samsung
11. R1-2103375 Discussion on essential corrections in physical layer structure LG Electronics
12. R1-2103376 Discussion on essential corrections in resource allocation procedure LG Electronics
13. R1-2103377 Discussion on essential corrections in physical layer procedure LG Electronics
14. R1-2103391 Remaining issues for sidelink physical layer procedure Huawei, HiSilicon
15. R1-2103466 Remaining issues on physical layer structure for NR sidelink Sharp
16. R1-2103468 Remaining issues on synchronization mechanism and QoS management for NR sidelink Sharp
17. R1-2103499 Remaining issues on mode 1 ZTE, Sanechips
18. R1-2103500 SL PHY procedure on prioritization ZTE, Sanechips
19. R1-2103555 Maintenance for resource allocation mechanism mode 1 NTT DOCOMO, INC.
20. R1-2103556 Maintenance for sidelink physical layer procedure NTT DOCOMO, INC.
21. R1-2103638 Remaining issues on DL pathloss for sidelink power control ASUSTeK
22. R1-2103672 Remaining issues on resource allocation mode-1 and sidelink procedure ASUSTeK
23. R1-2103707 Draft\_CR\_TS38.213 Ericsson
24. R1-2103708 Draft\_CR\_TS38.214 Ericsson
25. R1-2103709 Correction to PSCCH reserved bits definition Ericsson
26. R1-2103764 Maintenance for Resource allocation for sidelink - Mode 1 Nokia, Nokia Shanghai Bell
27. R1-2103766 Correction to PSFCH reception procedure for NACK-only case to mitigate half-duplex issue Intel Corporation