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

**e-Meeting, January 26th – February 5th, 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]-[50].

Identification of email discussions

It is proposed to organize the following email discussion:

* **M2 thread 1**
	+ M2-14: Correction to step 6) to include slots within Tproc0 (R1-2100945)
	+ M2-17: Clarify that hypothetical SCI in step 5) assumes N=1 num of repetitions (R1-2101533)
* **Separate thread for uncaptured agreements**
	+ M2-3: Capture RAN1#103-e agreement on pre-emption
* **Separate thread for LS reply**
	+ M2-10: MCS range for Mode-2 per MCS table (reply to R1-2009644)

Issue list

Open issue list:

* M2-1: Infinite loop or candidate resource set starvation due to step 5)
* M2-2: Clarification on UE procedure for determining the number of logical slots for a reservation period
* M2-9: HARQ RTT time gap capturing issue in MAC
* M2-14: Correction to step 6) to include slots within Tproc0 (R1-2100945)
* M2-15: Resource reservation period setting capturing issue in MAC
* M2-16: Handling of multiple TBs during resource selection
* M2-17: Clarify that hypothetical SCI in step 5) assumes N=1 num of repetitions (R1-2101533)
* M2-18: Exclude the slots with PSFCH when sl-LengthSymbols≤9 in the identification of candidate resources in the sensing procedure (R1-2101533)

Uncaptured RAN1#103-e agreements

* M2-3: Capture RAN1#103-e agreement on pre-emption

LS replies

* M2-10: MCS range for Mode-2 per MCS table (reply to R1-2009644)

Analysis of Draft Corrections

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| --- | --- | --- | --- |
| **Tdoc#** | **Issue within the tdoc** | **Issue index** | **FL comment** |
| R1-2100137, OPPO | Infinite loop or candidate resource set starvation due to step 5) | 1 | Can be discussed |
| R1-2100204, Huawei, HiSilicon | Infinite loop or candidate resource set starvation due to step 5) | 1 | Can be discussed |
|  | Clarification on UE procedure for determining the number of logical slots for a reservation period | 2 | Open issue. Decide whether to handle as Mode-2 or Procedures |
|  | Capture RAN1#103-e agreement on pre-emption | 3 | Include as a separate thread |
| R1-2100334, CATT, GOHIGH | Do not increment RSRP threshold in some cases for pre-emption | 4 | Optimization |
|  | Infinite loop or candidate resource set starvation due to step 5) | 1 | Can be discussed |
|  | Backward indication | 5 | Optimization |
|  | Name “sl-ThresPSSCH-RSRP-List” should be modified to “sl-Thres-RSRP-List” | 6 | Optimization |
|  | "remaining packet budget" should be replaced by "remaining packet delay budget" | 7 | Editorial |
| R1-2100411, vivo | Define dropping when HARQ RTT violated | 8 | Optimization |
|  | HARQ RTT time gap capturing issue in MAC | 9 | MAC capturing issue |
| R1-2100515, LG Electronics | MCS range for Mode-2 to be configured per MCS table | 10 | LS reply to R1-2009644 |
|  | Setting reservation period in non-initial resource selection after pre-emption | 11 | Optimization |
| R1-2100630, Intel Corporation | Capture RAN1#103-e agreement on pre-emption | 3 | Include as a separate thread |
| R1-2100799, Spreadtrum Communications | Sensing window to be Pm + 100 ms where Pm is the maximum of pre-configured periods | 12 | Optimization |
|  | $\left⌈X⋅M\_{total}\right⌉$ candidates should be selected and reported to higher layers | 13 | Optimization |
| R1-2100938, ZTE, Sanechips | Clarification on UE procedure for determining the number of logical slots for a reservation period | 2 | Open issue. Decide whether to handle as Mode-2 or Procedures |
| R1-2100945, NEC | Correction to step 6) to include slots within Tproc0 | 14 | Can be discussed |
| R1-2101073, ETRI | Capture resource reservation period setting either in L1 or MAC | 15 | MAC capturing issue |
| R1-2101175, Samsung | Clarification on UE procedure for determining the number of logical slots for a reservation period | 2 | Open issue. Decide whether to handle as Mode-2 or Procedures |
| R1-2101176, Samsung | MCS range for Mode-2 to be configured per MCS table | 10 | LS reply to R1-2009644 |
| R1-2101346, Apple  | Handling of multiple TBs during resource selection | 16 | Can be discussed |
|  | Infinite loop or candidate resource set starvation due to step 5) | 1 | Can be discussed |
| R1-2101437, Qualcomm Incorporated | Infinite loop or candidate resource set starvation due to step 5) | 1 | Can be discussed |
| R1-2101533, Sharp | Clarify that hypothetical SCI in step 5) assumes N=1 num of repetitions | 17 | Can be discussed |
|  | Exclude the slots with PSFCH when sl-LengthSymbols≤9 in the identification of candidate resources in the sensing procedure | 18 | Can be discussed |
|  | Clarification on timing relation between re-evaluation moment and initial selection moment | 19 | Optimization |
| R1-2101571, ASUSTeK | Handling of multiple TBs during resource selection | 16 | Can be discussed |
| R1-2101582, NTT DOCOMO, INC. | MCS range for Mode-2 to be configured per MCS table | 10 | LS reply to R1-2009644 |
| R1-2101759, Nokia, Nokia Shanghai Bell | Handling of multiple TBs during resource selection | 16 | Can be discussed |

References

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

1. R1-2100137 Remaining open issues and corrections for mode 1 and mode 2 RA OPPO
2. R1-2100204 Remaining details of sidelink resource allocation mode 2 Huawei, HiSilicon
3. R1-2100334 Discussion and TPs on resource allocation in NR V2X CATT, GOHIGH
4. R1-2100411 Maintenance on resource allocation mechanisms for NR sidelink vivo
5. R1-2100515 Discussion on essential corrections in resource allocation for Mode 1 and 2 LG Electronics
6. R1-2100630 Corrections to Mode-2 resource allocation Intel Corporation
7. R1-2100799 Remaining issues in NR sidelink mode 2 resource allocation Spreadtrum Communications
8. R1-2100938 The slot set for SL resource allocation procedure ZTE, Sanechips
9. R1-2100945 Remaining issues on resource allocation mode 2 NEC
10. R1-2101073 Remaining issues on resource allocation mode 2 for NR V2X ETRI
11. R1-2101175 Draft CR on Sidelink Physical Duration to Logical Slot Conversion Samsung
12. R1-2101176 Maintenance for NR Sidelink Mode 2 Operation Samsung
13. R1-2101346 Remaining Issues of Mode 2 Resource Allocation Apple
14. R1-2101437 Remaining Issues in Mode 2 Resource Allocation Qualcomm Incorporated
15. R1-2101533 Remaining issues on resource allocation for NR sidelink Sharp
16. R1-2101571 Remaining issues on sidelink mode 2 ASUSTeK
17. R1-2101582 Maintenance for sidelink synchronization and mode 2 NTT DOCOMO, INC.
18. R1-2101759 Remaining details for Resource allocation for sidelink - Mode 2 Nokia, Nokia Shanghai Bell

**Other Rel.16 NR V2X contributions**

1. R1-2100135 Draft TP on physical strucutre for NR sidelink OPPO
2. R1-2100136 Remaining open issues and corrections for physical layer procedure OPPO
3. R1-2100333 Discussion and TPs on sidelink synchronization mechanism and physical layer structure in NR V2X CATT, GOHIGH
4. R1-2100335 Discussion and TPs on physical layer procedures in NR V2X CATT, GOHIGH
5. R1-2100410 Maintenance on physical layer structure for NR sidelink vivo
6. R1-2100412 Maintenance on NR sidelink synchronization and procedures vivo
7. R1-2100514 Discussion on essential corrections in physical layer structure LG Electronics
8. R1-2100516 Discussion on essential corrections in physical layer procedure LG Electronics
9. R1-2100629 Correction to FD-OCC for PSCCH Intel Corporation
10. R1-2100631 Corrections to sidelink procedures Intel Corporation
11. R1-2100734 A remaining issue on Mode-1 resource allocation for NR sidelink Fujitsu
12. R1-2100735 Remaining issues on physical layer procedures for NR sidelink Fujitsu
13. R1-2100800 Remaining issues on sidelink physical layer procedure Spreadtrum Communications
14. R1-2100936 Remaining issues on sidelink synchronization ZTE, Sanechips
15. R1-2100937 Remaining issues on mode1 ZTE, Sanechips
16. R1-2101174 Maintenance for NR Sidelink Physical Layer Structure Samsung
17. R1-2101344 Remaining Issues of Sidelink Physical Layer Procedures Apple
18. R1-2101345 Remaining Issue of Mode 1 Resource Allocation Apple
19. R1-2101436 Remaining Issues in Mode 1 Resource Allocation Qualcomm Incorporated
20. R1-2101438 Remaining Issues in Physical Layer Procedure Qualcomm Incorporated
21. R1-2101532 Remaining issues on physical layer structure and procedures for NR sidelink Sharp
22. R1-2101534 Remaining issues on synchronization mechanism for NR sidelink Sharp
23. R1-2101581 Maintenance for resource allocation mechanism mode 1 NTT DOCOMO, INC.
24. R1-2101583 Maintenance for sidelink physical layer procedure NTT DOCOMO, INC.
25. R1-2101649 Remaining issues on type-1 HARQ-ACK codebook considering multiple sidelink reosurce pools ASUSTeK
26. R1-2101650 Remaining issues on sidelink procedure ASUSTeK
27. R1-2101707 Draft\_CR\_TS38.212 Ericsson
28. R1-2101708 Draft\_CR\_TS38.213 Ericsson
29. R1-2101709 Draft\_CR\_TS38.306 Ericsson
30. R1-2101732 Correction on PSBCH payload generation Huawei, HiSilicon
31. R1-2101733 Correction on determination of PSFCH resources based on a set of configured PRBs Huawei, HiSilicon
32. R1-2101760 Remaining details for Physical layer structure for sidelink Nokia, Nokia Shanghai Bell