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

**e-Meeting, January 26th – February 5th, 2021**

**Source: Moderator (Intel Corporation)**

**Title: Discussion on [104-e-NR-5G\_V2X-04]**

**Agenda item: 7.2.4**

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

Introduction

This document provides discussion on the identified thread related to Mode-2 resource allocation in RAN1#104-e:

[104-e-NR-5G\_V2X-04]: UE behaviour regarding non-monitored slots in mode 2, till 1/28, with potential CRs till 2/2 – Sergey (Intel)

* M2-17: Clarify that hypothetical SCI in step 5) assumes N=1 num of repetitions
* Changes for the uncaptured agreement (M2-3: Capture RAN1#103-e agreement on pre-emption) can be discussed during the CR preparation

Outcome Summary

TBD

Discussion

## Clarification on hypothetical SCI content during exclusion of slots related to non-monitored slots

In [15] (R1-2101533, Sharp) it is analysed that current implementation of step 5) in section 8.1.4 of TS 38.214 may be ambiguous. The issue is that this step invokes step 6)-c) for an assumption of hypothetical SCI to determine excluded slots and resource blocks. In the same time step 6)-c) refers to section 8.1.5 for determination of slots, but since a hypothetical SCI does not have a content it is impossible to derive the number of reserved slots N = 1 or 2 or 3.

To fix that, it is proposed to clarify in step 5) that the hypothetical SCI is assumed with N = 1.

**Q1-1: Do you agree to clarify in step 5) of section 8.1.4 of TS 38.214, that the hypothetical SCI is assumed with N = 1?**

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| **Source** | **Answer** | **Comment, if any** |
| NEC | Agree/Prefer | * N=1 seems reasonable for a hypothetical SCI with no TRIV.
* The 2nd option may be to assume all the slots within the 32 slots from the $t\_{m+q×P\_{rsvp\\_RX}^{'}}^{SL}$ are reserved. But this option sounds a bit excessive, we'd like to follow majority's view.
 |
| Huawei, HiSilicon | Agree | Clarification is needed, N=1 seems straightforward. |
| Sharp | Agree |  |
| Samsung | Agree |  |
| QC | Agree |  |
| Apple | Agree |  |
| ZTE | Disagree | Regarding the current spec, the hypothetical SCI received in slot $t'\_{m}^{SL}$ and indicates all subchannels of the resource pool in this slot, that means only one transmission is indicated in the slot, i.e. N=1. We agree with the intention, but we don’t think spec change is necessary. |

**Q1-2: If the answer in Q1-1 is positive, do you agree to implement the following change in step 5) of section 8.1.4 of TS 38.214 (TP#8 from R1-2101533)?**

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| <<< unchanged parts omitted >>>5) The UE shall exclude any candidate single-slot resource $R\_{x,y}$ from the set $S\_{A}$ if it meets all the following conditions:- the UE has not monitored slot $t'\_{m}^{SL}$ in Step 2.- for any periodicity value allowed by the higher layer parameter *sl-ResourceReservePeriodList* and a hypothetical SCI format 1-A received in slot $t'\_{m}^{SL}$ with '*Resource reservation period*' field set to that periodicity value, indicating all subchannels of the resource pool in this slot and *N*=1 actual resource, condition c in step 6 would be met.<<< unchanged parts omitted >>> |

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| **Source** | **Answer** | **Comment, if any** |
| NEC | Agree |  |
| Huawei, HiSilicon  | Ok with some revision | Suggest to add the following red part to be clearer:* “and *N*=1 actual resource as defined in Clause 8.1.5”
 |
| Sharp | Agree | Agree with HW’s revision. |
| Samsung | Agree |  |
| Apple | Agree |  |

## Capturing RAN1#103-e agreement on pre-emption

At the last meeting, the following late agreement was made which needs to be implemented in specifications:

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| Agreements:* When a UE checks pre-emption for a resource, the UE identifies a candidate resource set based on steps 1-7 in clause 8.1.4 TS 38.214
	+ After the candidate set is identified, the UE checks SL-RSRP measurement and priority condition as per agreements, for resource(s) {r’} subject to pre-emption overlapping with received SCI 1-A and not included in the candidate set, where the RSRP threshold is the final threshold after executing steps 1-7 i.e. includes all necessary increments for reaching X%.
 |

It was already discussed in RAN1#103-e that the agreement may be implemented by letting UE to check the RSRP threshold for a resource which is even not in the identified resource set. Two sources propose TPs for the agreement:

R1-2100204, Huawei, HiSilicon:

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| **--------------------------- Start of Text Proposal for TS 38.214 ------------------------****<Unchanged parts omitted>****8.1.4 UE procedure for determining the subset of resources to be reported to higher layers in PSSCH resource selection in sidelink resource allocation mode 2****<Unchanged parts omitted>**The UE shall report set $S\_{A}$ to higher layers. If a resource $r\_{i}$ from the set $(r\_{0},r\_{1},r\_{2},…)$ is not a member of $S\_{A}$, then the UE shall report re-evaluation of the resource $r\_{i}$ to higher layers.If a resource $r\_{i}^{'}$ from the set $(r\_{0}^{'},r\_{1}^{'},r\_{2}^{'},…)$ is not a member of $S\_{A}$, checks whether the RSRP measurement is higher than $\left(\_{}\_{}\right)$ for the received SCI format 1-A which overlaps with $\_{}^{}$ according to step 6) with an associated priority $prio\_{RX},$ where $\_{}$ satisfies one of the following conditions, and $\left(\_{}\_{}\right)$ is the final threshold after executing steps 1)-7), i.e. includes all necessary increments for reaching X%.- *sl-PreemptionEnable* is provided and is equal to 'enabled' and $prio\_{TX}>prio\_{RX}$- *sl-PreemptionEnable* is provided and is not equal to 'enabled', and $prio\_{RX}<prio\_{pre}$ and $prio\_{TX}>prio\_{RX}$If the RSRP measurement is higher than $\left(\_{}\_{}\right)$, then the UE shall report pre-emption of the resource $r\_{i}^{'}$ to higher layers. **<Unchanged parts omitted>****------------------------------------End of Text Proposal -------------------------------** |

R1-2100630, Intel Corporation:

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| 8.1.4 UE procedure for determining the subset of resources to be reported to higher layers in PSSCH resource selection in sidelink resource allocation mode 2**<<< Unchanged parts omitted >>>**If a resource $r\_{i}^{'}$ from the set $(r\_{0}^{'},r\_{1}^{'},r\_{2}^{'},…)$- is not a member of $S\_{A}$, and- if the RSRP measurement performed according to clause 8.4.2.1 for a received SCI format 1-A overlapped with the resource $\_{}^{}$ is higher than $\left(\_{}\_{}\right)$ including all increments after execution of steps 1-7 above, and- if an associated priority $prio\_{RX}$ satisfies one of the following conditions, then the UE shall report pre-emption of the resource $r\_{i}^{'}$ to higher layers. - *sl-PreemptionEnable* is provided and is equal to 'enabled' and $prio\_{TX}>prio\_{RX}$- *sl-PreemptionEnable* is provided and is not equal to 'enabled', and $prio\_{RX}<prio\_{pre}$ and $prio\_{TX}>prio\_{RX}$**<<< Unchanged parts omitted >>>** |

**Q2-1: Which of the above text proposal could be a starting point for implementing RAN1#103-e agreement? Do you have any other suggestions?**

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| **Source** | **Comments** |
| NEC | Either is OK, the one from Intel seems more concise. |
| Huawei, HiSilicon | It’s better to add the following red part to be more accurate, so the TP provided by Huawei/HiSilicon can be considered as a starting point.* “…higher than $Th'\left(prio\_{RX},prio\_{TX}\right)$ for the received SCI format 1-A which overlaps with $r\_{i}^{'}$ according to step 6) …”
 |
| Sharp | Both TPs are OK to us. For the TP from Intel, it seems that “overlapped with …” needs to refer to Step 6) as Huawei’s TP/comment. In our understanding, the condition of “is not a member of $S\_{A}$” seems unnecessary , since $\_{}^{}$ is excluded in Step 5) already and we believe this is the main reason why we had such an agreement. If companies are OK to this condition, we are fine. |
| Samsung | Intel’s TP looks better |
| QC | Agree with NEC |
| Apple | Either is fine. The second text proposal is a little preferred as a starting point.  |
| ZTE | Ok with either. |

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