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

**e-Meeting, May 10th – 27th, 2021**

**Source: Moderator (Intel Corporation)**

**Title: Discussion [105-e-NR-5G\_V2X-05]**

**Agenda item: 7.2.4**

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

Introduction

This document provides discussion on the following approved email thread as part of RAN1#105-e Release 16 NR V2X maintenance discussion:

[105-e-NR-5G\_V2X-05] Email discussion/approval regarding

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

till 5/24 – Sergey (Intel)

Outcome

Discussion on Draft CR

## Round 1

In RAN1#104bis-e the following agreement was made:

Agreement

* Update the specification of identification of candidate resources for Mode-2 resource allocation in section 8.1.4 of TS 38.214 to handle the case when X·M\_total number of identified resources could not be reached after any number of loop iterations
  + If the number of the excluded resources in step 5 is larger than (1-X)·M\_total, a UE skips step 5

There was no sufficient time to implement the above agreement as a CR. In this meeting, the discussion on CR is initiated separately.

From the review of contributions [1]-[7], the following two different interpretations have been identified:

**Interpretation 1 [1][2][3][5][6][7]**

* The step 5 is performed, and after its completion the condition on (1-X)·M\_total is checked. If the excluded number of resources is greater, then the result of step 5 is ignored, i.e. S\_A is re-initialized as in step 4.

**Interpretation 2 [4]**

* The step 5 is interpreted as a loop over periodicities and/or non-monitored slots. In this assumption, once a UE excludes a slot / period leading to the number of excluded resources greater than (1-X)·M\_total, it breaks the loop of step 5 and continues with step 6; S\_A is not re-initialized.

Note, in [1] it is proposed to further introduce additional functionality beyond the agreement proposed in P2 and P3, therefore these considerations are not taken into account – only P1 is assumed relevant.

It should be noted that Interpretation 1 was also FL understanding in RAN1#104bis-e, and this could be tracked from the beginning of the discussion in [104b-e-NR-5G\_V2X-03]. Nevertheless, the first question would be to confirm this interpretation (or interpretation 2), and then go to the detailed implementation discussion.

**Q1: Which of the interpretations 1 and 2 above is correct in your view and should be further pursued as a CR?**

|  |  |  |
| --- | --- | --- |
| **Source** | **Answer** | **Comment** |
| OPPO | Interpretation 1 | In our view, interpretation 2 was never intended and discussed as a solution from the beginning. It has several technical issues and these are discussed in [2]. |
|  |  |  |
|  |  |  |

References

1. **R1-2104194 TP to address infinite loop due to excessive resource exclusion for Rel. 16 V2X FUTUREWEI**

|  |
| --- |
| -------------------------------- Start of Text Proposal for 38.214 (Based on Proposal 1) -----------------------------------  <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>  5) The UE shall exclude any candidate single-slot resource from the set if it meets all the following conditions:  - the UE has not monitored slot 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 with '*Resource reservation period*' field set to that periodicity value and indicating all subchannels of the resource pool in this slot, condition c in step 6 would be met.  5-1) If the number of candidate single-slot resources excluded from the set in step 5 is greater than (1-X)⋅, the set is initialized to the set of all the candidate single-slot resources as in step 4).  <Unchanged parts omitted>  -------------------------------- End of Text Proposal for 38.214 (Based on Proposal 1) ----------------------------------- |

1. **R1-2104751 Discussion on TPs for skipping step 5 in mode 2 RA OPPO**

|  |
| --- |
| 4)  The set is initialized to the set of all the candidate single-slot resources.  5)  The UE shall exclude any candidate single-slot resource from the set if it meets all the following conditions:  -     the UE has not monitored slot 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 with '*Resource reservation period*' field set to that periodicity value and indicating all subchannels of the resource pool in this slot, condition c in step 6 would be met.  5-1) If the number of candidate single-slot resources excluded from the set in step 5 is greater than , the set is initialized to the set of all the candidate single-slot resources.  6)  The UE shall exclude any candidate single-slot resource from the set if it meets all the following conditions: |

1. **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**

|  |
| --- |
| << UNCHANGED PARTS OMITTED >>  4) The set is initialized to the set of all the candidate single-slot resources.  5) The UE shall exclude any candidate single-slot resource from the set if it meets all the following conditions:  - the UE has not monitored slot 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 with '*Resource reservation period*' field set to that periodicity value and indicating all subchannels of the resource pool in this slot, condition c in step 6 would be met.  If the number of candidate single-slot resources excluded from the set in step 5 is greater than , the set is initialized to the set of all the candidate single-slot resources.  6) The UE shall exclude any candidate single-slot resource from the set if it meets all the following conditions:  << UNCHANGED PARTS OMITTED >> |

1. **R1-2105463 Maintenance on NR sidelink mode-2 resource allocation mechanism vivo**

|  |
| --- |
| ------------------------------------------------ Start of Draft TP of TS 38.214 --------------------------------------------  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>  4) The set is initialized to the set of all the candidate single-slot resources.  5)  The UE shall exclude any candidate single-slot resource from the set if it meets all the following conditions:  -     the UE has not monitored slot 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 with '*Resource reservation period*' field set to that periodicity value and indicating all subchannels of the resource pool in this slot, condition c in step 6 would be met.  -     the number of candidate single-slot resources excluded from the set is not greater than  ---------------------------------------------------------- End of Draft TP ---------------------------------------------------- |

1. **R1-2105612 Remaining issues on mode 2 ZTE, Sanechips**

|  |
| --- |
| 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>  4) The set is initialized to the set of all the candidate single-slot resources.  5) The UE shall exclude any candidate single-slot resource from the set if it meets all the following conditions:  - the UE has not monitored slot 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 with '*Resource reservation period*' field set to that periodicity value and indicating all subchannels of the resource pool in this slot, condition c in step 6 would be met.  5-1) If the number of candidate single-slot resources remaining in the set is smaller than , the set is initialized to the set of all the candidate single-slot resources.  6) The UE shall exclude any candidate single-slot resource from the set if it meets all the following conditions:  a) the UE receives an SCI format 1-A in slot , and '*Resource reservation period'* field, if present, and '*Priority*' field in the received SCI format 1-A indicate the values and , respectively according to Clause 16.4 in [6, TS 38.213];  b) the RSRP measurement performed, according to clause 8.4.2.1 for the received SCI format 1-A, is higher than  c) the SCI format received in slot or the same SCI format which, if and only if the '*Resource reservation period*' field is present in the received SCI format 1-A, is assumed to be received in slot(s) determines according to clause 8.1.5 the set of resource blocks and slots which overlaps with for *q*=1, 2, …, *Q* and *j=*0, 1, …, . Here, is converted to units of logical slots according to clause 8.1.7, if and , where if slot *n* belongs to the set , otherwise slot is the first slot after slot *n* belonging to the set ; otherwise . is set to selection window size *T2* converted to units of msec.  7) If the number of candidate single-slot resources remaining in the set is smaller than , then is increased by 3 dB for each priority value and the procedure continues with step 4.  <Unchanged parts omitted> |

1. **R1-2105897 Condition to stop the infinite loop for Mode 2 RA Ericsson**

|  |
| --- |
| 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>  4) The set is initialized to the set of all the candidate single-slot resources.  5) The UE shall exclude any candidate single-slot resource from the set if it meets all the following conditions:  - the UE has not monitored slot 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 with '*Resource reservation period*' field set to that periodicity value and indicating all subchannels of the resource pool in this slot, condition c in step 6 would be met.  5-1) If the number of candidate single-slot resources excluded from the set in step 5 is greater than , the set is initialized to the set of all the candidate single-slot resources as indicated in Step 4. |

1. **R1-2105944 Maintenance for Resource allocation for sidelink - Mode 2 Nokia, Nokia Shanghai Bell**

|  |
| --- |
| -------------------------- Start of Text Proposal for TS 38.214 --------------------------  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 are omitted > --------------------------  5a) If the number of candidate single-slot resources remaining in the set is smaller than , then the set is initialized to the set of all the candidate single-slot resources.  -------------------------- End of Text Proposal for TS 38.214 -------------------------- |