**3GPP TSG RAN WG1 Meeting #101-E R1-** **200xxxx**

**e-Meeting, May 25th – June 5th, 2020**

**Source: Moderator (Intel Corporation)**

**Title: TPs based on outcome of [101-e-NR-5G\_V2X\_NRSL-Mode-2-01]**

**Agenda item: 7.2.4.2.2**

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

Introduction

The following agreements to be captured in RAN1 specifications were made in [101-e-NR-5G\_V2X\_NRSL-Mode-2-01].

|  |
| --- |
| Agreements:   * Tproc,0 is {1, 1, 2, [2 or 4]} physical slots for {15, 30, 60, 120} kHz sub-carrier spacing respectively   Agreements:   * Confirm that sensing window size parameter T0 is (pre)-configured between two values: 1100 ms and 100 ms   Working assumption   * Tproc,0 is 4 physical slots for 120 kHz sub-carrier spacing   Agreements:   * T3 = Tproc,1, where the UE is only required to include sensing information from time earlier than ‘m – T3 – Tproc,0’ for pre-emption and re-evaluation check at time ‘m – T3’   Working assumption:   * Tproc,1 is 2 ms converted to physical slots+ 1 slot, i.e. {3, 5, 9, 17} for {15, 30, 60, 120} kHz sub-carrier spacing respectively |

TP to 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

In resource allocation mode 2, the higher layer can request the UE to determine a subset of resources from which the higher layer will select resources for PSSCH/PSCCH transmission. To trigger this procedure, in slot *n,* the higher layer provides the following parameters for this PSSCH/PSCCH transmission:

- the resource pool from which the resources are to be reported;

- L1 priority, ;

- the remaining packet delay budget;

- the number of sub-channels to be used for the PSSCH/PSCCH transmission in a slot, ;

- optionally, the resource reservation interval, , in units of ms.

The following higher layer parameters affect this procedure:

*- t2min\_SelectionWindow:* internal parameter is set to the corresponding value from higher layer parameter *t2min\_SelectionWindow* for the given value of .

*- SL-ThresRSRP\_pi\_pj*: this higher layer parameter provides an RSRP threshold for each combination , where is the value of the priority field in a received SCI format 0-1 and is the priority of the transmission of the UE selecting resources; for a given invocation of this procedure, .

*- RSforSensing* selects if the UE uses the PSSCH-RSRP or PSCCH-RSRP measurement, as defined in clause 8.4.2.1.

*- reservationPeriodAllowed*

*- t0\_SensingWindow*: internal parameter is defined as the number of slots corresponding to *t0\_SensingWindow* ms.

The resource reservation interval, , if provided, is converted from units of *ms* to units of logical slots, resulting in .

Notation:

denotes the set of slots which can belong to a sidelink resource pool and is defined in [TBD].

The following steps are used:

1) A candidate single-slot resource for transmission is defined as a set of contiguous sub-channels with sub-channel *x+j* in slot where . The UE shall assume that any set of contiguous sub-channels included in the corresponding resource pool within the time interval correspond to one candidate single-slot resource, where

- selection of is up to UE implementation under , where is defined in Table 8.1.4-2 where is the SCS configuration of the SL BWP;

- if is shorter than the remaining packet delay budget (in slots) then is up to UE implementation subject to remaining packet budget (in slots); otherwise is set to the remaining packet delay budget (in slots).

The total number of candidate single-slot resources is denoted by .

2) The sensing window is defined by the range of slots [) where is defined above and is defined in Table 8.1.4-1 where is the SCS configuration of the SL BWP. The UE shall monitor slots which can belong to a sidelink resource pool within the sensing window except for those in which its own transmissions occur. The UE shall perform the behaviour in the following steps based on PSCCH decoded and RSRP measured in these slots.

3) The internal parameter is set to the corresponding value from higher layer parameter *SL-ThresRSRP\_pi\_pj* for equal to the given value of and each priority value .

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 *reservationPeriodAllowed* and a hypothetical SCI format 0-1 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.

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 [TBD] 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, 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 converted to units of *ms*..

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.

The UE shall report set to higher layers.

Table 8.1.4-1 depending on sub-carrier spacing

|  |  |
| --- | --- |
|  |  |
| 0 | 1 |
| 1 | 1 |
| 2 | 2 |
| 3 | 4 |

Table 8.1.4-2 depending on sub-carrier spacing

|  |  |
| --- | --- |
|  |  |
| 0 | 3 |
| 1 | 5 |
| 2 | 9 |
| 3 | 17 |

|  |  |
| --- | --- |
| Source | Comments |
| OPPO | The unit for and can be defined in the description similar to as:   * is defined as number of slots in Table 8.1.4-1 where is the SCS configuration of the SL BWP * is defined as number of slots in Table 8.1.4-2 where is the SCS configuration of the SL BWP   Agree to capture the definition for as part of thread #5 TP. |
|  |  |
|  |  |

References

1. [R1-2003310](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_101\Docs\R1-2003310.zip) Remaining details of Resource Allocation Mode 2 Nokia, Nokia Shanghai Bell
2. [R1-2003379](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_101\Docs\R1-2003379.zip) Remaining issues on mode 2 resource allocation mechanism vivo
3. [R1-2003495](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_101\Docs\R1-2003495.zip) Remaining details of sidelink resource allocation mode 2 Huawei, HiSilicon
4. [R1-2003549](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_101\Docs\R1-2003549.zip) Remaining issues in Mode-2 ZTE, Sanechips
5. [R1-2003559](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_101\Docs\R1-2003559.zip) Remaining Issues on Sidelink Mode 2 Resource Allocation Panasonic Corporation
6. [R1-2003563](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_101\Docs\R1-2003563.zip) Discussion on resource allocation for Mode 2 LG Electronics
7. [R1-2003613](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_101\Docs\R1-2003613.zip) Remaining issues on Mode 2 resource allocation in NR V2X CATT
8. [R1-2003653](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_101\Docs\R1-2003653.zip) Remaining Issues on Resource Allocation in NR Sidelink Mode 2 ITRI
9. [R1-2003671](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_101\Docs\R1-2003671.zip) Sidelink mode-2 resource allocation MediaTek Inc.
10. [R1-2003703](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_101\Docs\R1-2003703.zip) Remaining issues for Mode 2 resource allocation in NR V2X ASUSTeK
11. [R1-2003735](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_101\Docs\R1-2003735.zip) Remaining details of Mode-2 NR V2X sidelink design Intel Corporation
12. [R1-2003807](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_101\Docs\R1-2003807.zip) Remaining details on mode-2 resource allocation Futurewei
13. [R1-2003874](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_101\Docs\R1-2003874.zip) On Mode 2 for NR Sidelink Samsung
14. [R1-2003991](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_101\Docs\R1-2003991.zip) Remaining issues in NR sidelink mode 2 resource allocation Spreadtrum Communications
15. [R1-2004043](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_101\Docs\R1-2004043.zip) Remaining details on mode 2 resource allocation for NR V2X Fujitsu
16. [R1-2004074](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_101\Docs\R1-2004074.zip) Discussion on remaining open issue for mode 2 OPPO
17. [R1-2004171](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_101\Docs\R1-2004171.zip) Resource allocation for NR sidelink Mode 2 TCL Communication Ltd.
18. [R1-2004217](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_101\Docs\R1-2004217.zip) Remaining Issues of Mode 2 Resource Allocation Apple
19. [R1-2004295](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_101\Docs\R1-2004295.zip) Remaining Issues on NR Sidelink Mode 2 Resource Allocation InterDigital, Inc.
20. [R1-2004310](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_101\Docs\R1-2004310.zip) Remaining issues on resource allocation Mode 2 NEC
21. [R1-2004328](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_101\Docs\R1-2004328.zip) Remaining issues on resource allocation mode 2 for NR sidelink Sharp
22. [R1-2004385](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_101\Docs\R1-2004385.zip) Remaining issues on resource allocation mechanism mode 2 NTT DOCOMO, INC.
23. [R1-2004452](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_101\Docs\R1-2004452.zip) Sidelink Resource Allocation Mode 2 Qualcomm Incorporated
24. [R1-2004531](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_101\Docs\R1-2004531.zip) Remain details on mode-2 resource allocation for NR V2X ITL
25. [R1-2004544](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_101\Docs\R1-2004544.zip) Resource allocation Mode 2 for NR SL Ericsson