**3GPP TSG RAN WG1 Meeting #100bis-E R1-200xxxx**

**e-Meeting, April 20th – 30th, 2020**

**Source: Moderator (Intel Corporation)**

**Title: TP Email Discussion #6 [100b-e-NR-5G\_V2X\_NRSL-Mode-2-06]**

**Agenda item: 7.2.4.2.2**

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

Introduction

This document provides discussion on TP as per the sixth email discussion on V2X Mode-2 during RAN1#100bis-e.

[100b-e-NR-5G\_V2X\_NRSL-Mode-2-06] Email approval of TPs to fix PSSCH RSRP and capture exclusion of TTIs in the same period / aperiodic reservations

till 4/23 (Intel, Sergey)

TP on PSSCH DMRS

In [8], the following TP is provided:

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| 8.4.2.1 RSRP for resource selection in sidelink resource allocation mode 2In sidelink resource allocation mode 2, the UE measures RSRP for resource selection as follows: - PSSCH-RSRP over the DM-RS resource elements for ~~the PSCCH carrying the received SCI format 0-1~~ the PSSCH according to the received SCI format 0-1 if higher layer parameter *RSforSensing* is set to “*PSSCH DM RS*”, and - PSCCH-RSRP over the DM-RS resource elements for ~~the PSSCH according to the received SCI format 0-1~~ the PSCCH carrying the received SCI format 0-1 if higher layer parameter *RSforSensing* is set to “*PSCCH DM RS*”. |

In [21], the following TP is provided:

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| ===============start================8.4.2.1 RSRP for resource selection in sidelink resource allocation mode 2In sidelink resource allocation mode 2, the UE measures RSRP for resource selection as follows: - PSSCH-RSRP over the DM-RS resource elements for the PSSCH according to the received SCI format 0-1 if higher layer parameter *sl-RS-ForSensing* is set to " *pssch* ", and - PSCCH-RSRP over the DM-RS resource elements for the PSCCH carrying the received SCI format 0-1 if higher layer parameter *sl-RS-ForSensing* is set to " *pscch* ".===============end================ |

It seems both TPs fix the same issue in the same manner, while the TP from [21] also aligns the RRC parameter name to the latest RAN2 CR. Thus, this TP version is proposed to be captured:

--------------------------------------------- TP to 38.214, section 8.4.2.1 starts ---------------------------------------------------

8.4.2.1 RSRP for resource selection in sidelink resource allocation mode 2

In sidelink resource allocation mode 2, the UE measures RSRP for resource selection as follows:

- PSSCH-RSRP over the DM-RS resource elements for the PSSCH according to ~~PSCCH carrying~~ the received SCI format 0-1 if higher layer parameter *sl-RS-ForSensing~~RSforSensing~~* is set to "*pssch~~PSSCH DM RS~~*", and

- PSCCH-RSRP over the DM-RS resource elements for the ~~PSSCH according to~~ PSCCH carrying the received SCI format 0-1 if higher layer parameter *sl-RS-ForSensing~~RSforSensing~~*is set to "*pscch~~PSCCH DM RS~~*".

--------------------------------------------- TP to 38.214, section 8.4.2.1 ends ---------------------------------------------------

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| Source | Comments |
| Sharp | Fine with the TP. |
| CATT | Agree with the TP from NEC[21]. |
|  |  |

TP on Exclusion of Same Period TTIs / Aperiodic Exclusion

There is one identified gap in current implementation of specification. It seems current specification may not clearly capture the case of aperiodic reservations.

In [24], the following TP is provided to fix the issue:

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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[…]The following steps are used:[…]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 *reservationPeriodAllowed* and a hypothetical SCI format 0-1 received in slot $t\_{m}^{SL}$ 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 $R\_{x,y}$ from the set $S\_{A}$ if it meets all the following conditions:a) the UE receives an SCI format 0-1 in slot $t\_{m}^{SL}$, and "Resource reservation period" field, if present, and "Priority" field in the received SCI format 0-1 indicate the values $P\_{rsvp\\_RX}$ and $prio\_{RX}$, 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 0-1, is higher than $Th\left(prio\_{RX}\right)$;c) the SCI format received in slot $t\_{m}^{SL}$or the same SCI format which, if and only if the "Resource reservation period" field is present in the received SCI format 0-1, is assumed to be received in slot(s) $t\_{m+q×P\_{rsvp\\_RX}^{'}}^{SL}$ determines according to clause [TBD] in [6, TS 38.213] the set of resource blocks and slots which overlaps with $R\_{x,y+j×P\_{rsvp\\_TX}^{'}}$ for *q*=1, 2, …, *Q* and *j=*0, 1, …, $C\_{resel}-1$. Here, $P\_{rsvp\\_RX}^{'}$ is $P\_{rsvp\\_RX}$ converted to units of logical slots, $Q=\left⌈\frac{T\_{scal}}{P\_{rsvp\\_RX}}\right⌉ $ if $P\_{rsvp\\_RX}< T\_{scal}$ and $ n^{'}-m\leq P\_{rsvp\\_RX}^{'}$, where $t\_{n^{'}}^{SL} = n$ if slot n belongs to the set $\left(t\_{0}^{SL},t\_{1}^{SL},...,t\_{T\_{max}}^{SL}\right)$, otherwise slot $t\_{n^{'}}^{SL}$ is the first slot after slot n belonging to the set $\left(t\_{0}^{SL},t\_{1}^{SL},...,t\_{T\_{max}}^{SL}\right)$; otherwise $Q=1$. $T\_{scal}$ is FFS7) The UE shall exclude any candidate single-slot resource $R\_{x,y}$ from the set $S\_{A}$ if it meets all the following conditions:a) the UE receives an SCI format 0-1 in slot $t\_{m}^{SL}$, and "Priority" field in the received SCI format 0-1 indicate the values $P\_{rsvp\\_RX}$ and $prio\_{RX}$, 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 0-1, is higher than $Th\left(prio\_{RX}\right)$;c) the SCI format received in slot $t\_{m}^{SL}$or the same SCI format is assumed to be received in slot(s) $t\_{m+y^{'}}^{SL}$ determines according to clause [8.1.5] the set of resource blocks and slots which overlaps with $R\_{x^{'},y+y^{'}}$. Here, $x^{'}$ and $y^{'}$ are indicated by "Time resource assignment" field and "Frequency resource assignment" field in the SCI format, respectively.~~7~~8) If the number of candidate single-slot resources remaining in the set $S\_{A}$ is smaller than $0.2⋅M\_{total}$, then $Th(p\_{i})$ is increased by 3 dB for each priority value $Th(p\_{i})$ and the procedure continues with step 4.The UE shall report set $S\_{A}$ to higher layers. |

In [27], the following TP is provided to fix the issue:

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| ----------------------------------------------------begin text proposal for 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 text omitted>>>b) the RSRP measurement performed, according to clause 8.4.2.1 for the received SCI format 0-1, is higher than $Th\left(prio\_{RX}\right)$;c) the SCI format received in slot $t\_{m}^{SL}$or the same SCI format which, if and only if the "Resource reservation period" field is present in the received SCI format 0-1, is assumed to be received in slot(s) $t\_{m+q×P\_{rsvp\\_RX}^{'}}^{SL}$ determines according to clause [TBD] in [6, TS 38.213] the set of resource blocks and slots which overlaps with $R\_{x,y+j×P\_{rsvp\\_TX}^{'}}$ for *q*=0,1, 2, …, *Q* and *j=*0, 1, …, $C\_{resel}-1$. Here, $P\_{rsvp\\_RX}^{'}$ is $P\_{rsvp\\_RX}$ converted to units of logical slots, $Q=\left⌈\frac{T\_{scal}}{P\_{rsvp\\_RX}}\right⌉ $ if $P\_{rsvp\\_RX}< T\_{scal}$ and $ n^{'}-m\leq P\_{rsvp\\_RX}^{'}$, where $t\_{n^{'}}^{SL} = n$ if slot n belongs to the set $\left(t\_{0}^{SL},t\_{1}^{SL},...,t\_{T\_{max}}^{SL}\right)$, otherwise slot $t\_{n^{'}}^{SL}$ is the first slot after slot n belonging to the set $\left(t\_{0}^{SL},t\_{1}^{SL},...,t\_{T\_{max}}^{SL}\right)$; otherwise $Q=1$. $T\_{scal}$ is FFS.-----------------------------------------------------end text proposal for 38.214----------------------------------------------------- |

In FL understanding, TP in [24] may repeat already captured procedures, if the “[TBD] in [6, TS 38.213]” part in step 6c is updated to the actual clause 8.1.5 which instructs how time and frequency resources indicated in SCI are determined.

In FL understanding, TP in [27] may not fully solve the mentioned problem. It is preferred to clearly define that q and P\_rsrp\_RX is only applied in case of periodic indication in SCI 0-1. This version is proposed to be discussed/approved:

-----------------------------------------------------start text proposal for 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 text omitted>>>

b) the RSRP measurement performed, according to clause 8.4.2.1 for the received SCI format 0-1, is higher than $Th\left(prio\_{RX}\right)$;

c) the SCI format received in slot $t\_{m}^{SL}$or the same SCI format which, if and only if the "Resource reservation period" field is present in the received SCI format 0-1, is assumed to be received in slot(s) $t\_{m+q×P\_{rsvp\\_RX}^{'}}^{SL}$ determines according to clause 8.1.5 the set of resource blocks and slots which overlaps with $R\_{x,y+j×P\_{rsvp\\_TX}^{'}}$ for *j=*0, 1, …, $C\_{resel}-1$. If and only if the "Resource reservation period" field is present in the received SCI format 0-1,*q*=1, 2, …, *Q* . Here, $P\_{rsvp\\_RX}^{'}$ is $P\_{rsvp\\_RX}$ converted to units of logical slots, $Q=\left⌈\frac{T\_{scal}}{P\_{rsvp\\_RX}}\right⌉ $ if $P\_{rsvp\\_RX}< T\_{scal}$ and $ n^{'}-m\leq P\_{rsvp\\_RX}^{'}$, where $t\_{n^{'}}^{SL} = n$ if slot n belongs to the set $\left(t\_{0}^{SL},t\_{1}^{SL},...,t\_{T\_{max}}^{SL}\right)$, otherwise slot $t\_{n^{'}}^{SL}$ is the first slot after slot n belonging to the set $\left(t\_{0}^{SL},t\_{1}^{SL},...,t\_{T\_{max}}^{SL}\right)$; otherwise $Q=1$. $T\_{scal}$ is FFS.

-----------------------------------------------------end text proposal for 38.214-----------------------------------------------------

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| Source | Comments |
| Ericsson | We do not think that any of the changes are necessary:* Receiving “the same SCI format in slot $t\_{m+q×P\_{rsvp\\_RX}^{'}}^{SL} $… ” for q=0 is already covered by the first part of the sentence that states that “the SCI format received in slot $t\_{m}^{SL}$ … ”
* The statement “if and only if the "Resource reservation period" field is present in the received SCI format 0-1” is present in the first sentence in the original form. That is everything that is necessary. The “if and only if” condition applies to “the same SCI format with is assumed to be received in slot(s) $t\_{m+q×P\_{rsvp\\_RX}^{'}}^{SL}$”. Clearly the description of the parameter q only makes sense when this condition is active. This is captured in the original wording.
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| Samsung | Agree with Ericsson. The newly added sentence in the proposed TB already have been captured in the first part of the sentence in 6)-c). |
| Sharp | Similar view as Ericsson and Samsung (we think the very first change is necessary but it is purely editorial and does not deserve a TP for approval).  |
| CATT | Agree with Ericsson and Samsung. The contents of the proposed TP have been captured in the section 8.1.4 of 38.214. |

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