**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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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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