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

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

**Source: Moderator (Intel Corporation)**

**Title: TP Email Discussion #5 [100b-e-NR-5G\_V2X\_NRSL-Mode-2-05]**

**Agenda item: 7.2.4.2.2**

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

Introduction

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

[100b-e-NR-5G\_V2X\_NRSL-Mode-2-05] Email approval of TP capturing previous meeting’s agreement regarding Time and frequency resource indication based on the submitted contributions till 4/22 (Intel, Sergey)

The intention of the TP is to implement the following agreements made in RAN1#100e:

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| --- |
| Agreements:* Time resource assignment in SCI uses an extended time domain RIV mechanism as follows:

if $N=1$$TRIV=0$ elseif $N=2$$TRIV=T\_{1} $ elseif $\left(T\_{2}-T\_{1}-1\right)\leq 15$$TRIV=30\left(T\_{2}-T\_{1}-1\right)+T\_{1}+31$ else$TRIV=30\left(31-T\_{2}+T\_{1}\right)+62-T\_{1}$ end ifend ifwhere* N denotes the actual number of resources indicated
* Ti denotes i-th resource time offset
	+ for N=2, $1\leq T\_{1}\leq 31$
	+ for N=3, $1\leq T\_{1}\leq 30$, $T\_{1}<T\_{2}\leq 31$

Agreements:* For frequency resource indication, the following resource index calculation is used
	+ For Nmax = 2,
		- $r=f\_{2}+\sum\_{i=1}^{m-1}\left(N\_{ subchannel}^{ SL}+1-i\right)$
	+ For Nmax = 3,
		- $r=f\_{2}+f\_{3}⋅\left(N\_{ subchannel}^{ SL}+1-m\right)+\sum\_{i=1}^{m-1}\left(N\_{ subchannel}^{ SL}+1-i\right)^{2}$
	+ where
		- f2 denotes lowest sub-channel index for the second resource, if any
		- f3 denotes lowest sub-channel index for the third resource, if any
		- m denotes number of sub-channels in a frequency resource allocation
	+ If time domain allocation indicates N < Nmax, the decoded lowest sub-channel indexes corresponding to Nmax minus N last resources are not used
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The draft TPs were identified in contributions [1] and [13]. In the next section, the TP based on these contributions is provided.

Proposed draft TP to TS 38.214

--------------------------------------------- TP to 38.214, section 8.1.5 starts ---------------------------------------------------

8.1.5 UE procedure for determining slots and resource blocks for PSSCH transmission associated with an SCI format 0-1

The set of slots and resource blocks for PSSCH transmission is determined by the resource used for the PSCCH transmission containing the associated SCI format 0-1, and fields "Frequency resource assignment", "Time resource assignment" of the associated SCI format 1 as described below.

"Time resource assignment" carries logical slot index indication of N = 1 or 2 or 3 actual resources in a form of time RIV (TRIV) field which is determined as follows:

if $N=1$

$$TRIV=0$$

elseif $N=2$

$$TRIV=T\_{1}$$

else

if $\left(T\_{2}-T\_{1}-1\right)\leq 15$

$$TRIV=30\left(T\_{2}-T\_{1}-1\right)+T\_{1}+31$$

else

$$TRIV=30\left(31-T\_{2}+T\_{1}\right)+62-T\_{1}$$

end if

end if

where $T\_{i}$ denotes i-th resource time offset in logical slots of a resource pool with respect to the first resource where N = 2, $1\leq T\_{1}\leq 31$, for N = 3, $1\leq T\_{1}\leq 30$, $T\_{1}<T\_{2}\leq 31$.

The lowest sub-channel index of the first PSSCH associated with the received SCI format 0-1 is determined from the sub-channel index where PSCCH carrying the SCI format 0-1 is received. The number of allocated sub-channels $L\_{subCH}$ and the lowest sub-channel indexes of other PSSCH reserved by the received SCI format 0-1 are determined from "Frequency resource assignment" which is equal to a frequency resource index $r$ where.

If *sl-MaxNumPerReserve* is 2 then $r=f\_{2}+\sum\_{i=1}^{L\_{subCH}-1}\left(N\_{ subchannel}^{ SL}+1-i\right)$,

If *sl-MaxNumPerReserve* is3 then $r=f\_{2}+f\_{3}⋅\left(N\_{ subchannel}^{ SL}+1-L\_{subCH}\right)+\sum\_{i=1}^{L\_{subCH}-1}\left(N\_{ subchannel}^{ SL}+1-i\right)^{2}$*,*

where

- $f\_{2}$ denotes the lowest sub-channel index for the second resource, if any

- $f\_{3}$ denotes the lowest sub-channel index for the third resource, if any

If TRIV indicates *N* < *sl-MaxNumPerReserve*, the decoded lowest sub-channel indexes corresponding to *sl-MaxNumPerReserve* minus N last resources are not used.

--------------------------------------------- TP to 38.214, section 8.1.5 ends ---------------------------------------------------

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| --- | --- |
| Source | Comments |
| Qualcomm | To clarify that N is bounded by N\_max:* "Time resource assignment" carries logical slot index indication of N = 1 or 2 or, when *sl-MaxNumPerPreserve* is 3, 3 actual resources in a form of time RIV (TRIV) field which is determined as follows

Editorial comments:* where $T\_{i}$ denotes i-th resource time offset in logical slots of a resource pool with respect to the first resource where for N = 2, $1\leq T\_{1}\leq 31$~~,~~; and for N = 3, $1\leq T\_{1}\leq 30$, $T\_{1}<T\_{2}\leq 31$.
* Could you replace $T\_{1},T\_{2}$ with different variable names to avoid confusion with the selection window limits, which are also used in 38.214? For example, $S\_{1},S\_{2}$ (or $X\_{1},X\_{2}$), …
 |
| Apple | We prefer to denote f2 and f3 as “the **starting** sub-channel index….”, as defined in LTE V2X (TS36.213). Similar to TRIV, we could use the term FRIV, rather than “r”, for the frequency resource index. |
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References

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