**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:

|  |
| --- |
| Agreements:   * Time resource assignment in SCI uses an extended time domain RIV mechanism as follows:   if    elseif    else  if    else    end if  end if  where   * N denotes the actual number of resources indicated * Ti denotes i-th resource time offset   + for N=2,   + for N=3, ,   Agreements:   * For frequency resource indication, the following resource index calculation is used   + For Nmax = 2,   + For Nmax = 3,   + 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 |

The draft TPs were identified in contributions [1], [7] 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 offset indication of N = 1 or 2 actual resources when *sl-MaxNumPerPreserve* is 2, and N = 1 or 2 or 3 actual resources when *sl\_MaxNumPerPreserve* is 3, in a form of time RIV (TRIV) field which is determined as follows:

if

elseif

else

if

else

end if

end if

where denotes i-th resource time offset in logical slots of a resource pool with respect to the first resource where for N = 2, ; and for N = 3, , .

The starting sub-channel of the PSSCH associated with the slot where SCI format 0-1 received, is determined according to clause 8.1.2.2. The number of contiguously allocated sub-channels and the starting sub-channel indexes of resources reserved by the received SCI format 0-1 are determined from "Frequency resource assignment" which is equal to an extended frequency RIV (FRIV) where.

If *sl-MaxNumPerReserve* is 2 then

If *sl-MaxNumPerReserve* is3 then

where

- denotes the starting sub-channel index for the second resource

- denotes the starting sub-channel index for the third resource

- is the number of sub-channels in a resource pool provided according to the higher layer parameter *numSubchannel*

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

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

|  |  |  |
| --- | --- | --- |
| Source | Comments | FL 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 denotes i-th resource time offset in logical slots of a resource pool with respect to the first resource where for N = 2, ~~,~~; and for N = 3, , . * Could you replace with different variable names to avoid confusion with the selection window limits, which are also used in 38.214? For example, (or ), … | Tried to accept all the proposed changes |
| 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. | Accepted the proposed changes |
| Sharp | 1. Similar to Qualcomm’s first proposed change, but it would be clearer if we say “N=1 or 2 when sl-MaxNumPerPreserve is 2, and N=1 or 2 or 3 when sl\_MaxNumPerPreserve is 3”. 2. Not sure if it is clear enough to say “other PSSCH”. It could happen that a resource is reserved but eventually not used, in which case there is no “other PSSCH” transmission. It may be better to just use “resource” as already used in other places of the TP. 3. Could we add a reference to the definition of ? 4. Agree with Apple that to be consistent, it would be better to use FRIV rather than “r”. | Accepted the proposed changes |
| CATT | Agree with the first change of Qualcomm, and N is bounded by N\_max.  Agree with Apple that FRIV rather than “r” should be used for the frequency resource index. | Accepted the changes |
| Huawei/HiSilicon | The description that “*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*” is inaccurate, where the PSSCH associated the received SCI does not have to be “***the first PSSCH***” in time among the all resources indicated by the SCI, the restriction on the sequence in time should not be introduced.  The lowest sub-channel for PSSCH associated the received SCI has been captured in the existing section 8.1.2.2 of TS 38.214 as follows:  *The lowest sub-channel for sidelink transmission is the sub-channel on which the lowest PRB of the associated PSCCH is transmitted.*  Similarly, the notations that “the lowest sub-channel index for the second/third resource” for f2 and f3 should be removed. f2 and f3 should be denoted as the first sub-channel index and the second sub-channel index ,  The frequency resource index “r” should be replaced by frequency resource indication valued FRIV. | I think with current agreements (w/o backward indication) it is OK to use “first”, and modify later if needed. But I removed “first” and clarified that this is for the resource where current SCI 0-1 received.  My understanding of 8.1.2.2 is to define a PSSCH resource for demodulation purpose mainly, and this section 8.1.5 is mainly for resource reservation purpose. I’m open to simplify, if needed.  I replaced f2/f3 with , although there is no definition of them previously, so that we are open to use any notations.  Replaced ‘r’ by FRIV |
| Huawei/HiSilicon (v7) | * Since backward indication is still under discussion, and the word “extended” seems unclear and unnecessary, the following changes are suggested::   “…The number of contiguously allocated sub-channels and the starting sub-channel indexes of resources ~~reserved~~ indicated by the received SCI format 0-1 are determined from "Frequency resource assignment" which is equal to an ~~extended~~ frequency RIV (FRIV) where.”   * Since the FL has already removed “first” (see the comment above), now it’s unclear and unnecessary to say “the second/third resource”, so the following changes are suggested:   “- denotes the first starting sub-channel index ~~for the second resource~~  - denotes the second starting sub-channel index ~~for the third resource~~” |  |

References

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