**[100b-e-NR-5G\_V2X\_NRSL-SYNC-01]**

**Email discussion/approval related to PSBCH contents - indication of TDD configuration**

[100b-e-NR-5G\_V2X\_NRSL-SYNC-01] Email discussion/approval related to PSBCH contents - Indication of TDD configuration

(a,k.a. issue 1-1) by 4/24, with potential TPs by 4/29 (CATT, Teng)

**Issue 1-1 Indication of TDD configuration**

***Proposal 1: Among the 12 bits for indication of TDD configuration:***

* ***X=1 bit indicates the number of patterns.***
* ***Y=4 bits indicate the periodicity information.***
* ***Z=7 bits indicate the UL slots.***

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| --- | --- |
| **Company** | **Views** |
| CMCC | **Not fully agree.**1. ***X=1 bit indicates the number of patterns: Agree***
2. ***Y=4 bits indicate the periodicity information: Agree***
3. ***Z=7 bits indicate the UL slots: Not agree***

We think the number of bits of Z is highly related to the indication method, i.e. joint indication (option 1) or independent indication (option 2) of UL slot in two patterns, so it is preferred to be discuss the design details first. It can be observed from the table below that for FR2, ***only the first 6 periodicity combinations (highlighted in grey) can be indicated within Z=7 bits (joint indication) or Z=8 bits (independent indication) using one-120KHz-slot granularity.*** For the rest of the periodicities, the granularity should be larger which sacrifices the indication flexibility, i.e. for 10ms+10ms periodicity, six-slot granularity is used for independent indication with Z=8 bits and eight-slot granularity is used for joint indication with Z=7 bits.***We are considering an additional way to reduce the impact, that is, we omit the state that the full periodicity are all UL slot***, which lead to option 1’(joint indication) and option 2’(independent indication) in the following table. For example, when 2ms+2ms is configured, if we do not indicate the case with all 16 slots as UL, the number of states to indicate is only 16, resulting that only 8bits (either joint indication or independent indication) are needed compared with the original option 1/2 where 9bits/10bits are required. In this way, ***more periodicity combinations (11 combinations highlighted in grey) can be indicated within 8bits without sacrificing slot granularity.*** Regarding the resource waste, we consider it acceptable since sacrificing only one slot when the whole periodicity is configured as UL. Therefore, ***it is preferred to use Z=8bits independent indication for finer granularity for more periodicity combination. The number of UL slots is indicated using 120KHz as reference SCS with different granularities for different periodicity combinations as follow:****• For 0.5+0.5ms, 0.625+0.625ms, 1+1ms, 0.5+2ms, 2+0.5ms, 1.25+1.25ms, 1+3ms, 3+1ms, 2+2ms, 1+4ms and 4+1ms periodicity combinations,* ***one-slot granularity*** *is used;**• For 2+3ms, 3+2ms and 2.5+2.5ms combinations,* ***two-slot granularity*** *is used;**• For 5ms+5ms periodicity,* ***three-slot granularity*** *is used;**• For 10ms+10ms periodicity,* ***five-slot granularity*** *is used.* **Table 1 Number of bits needed for indicating number of UL slot using 120Khz as reference SCS**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Pattern 1 | Pattern 2 | Total number of 120KHz slotsN\_1 | Total number of 120KHz slotsN\_2 | Option 1:Number of bits for ***joint indication***$$\left⌈log\_{2}\left(N\_{1}+1\right)(N\_{2}+1)\right⌉⌉$$ | Option 2:Number of bits for ***independent indication***$$\left⌈log\_{2}\left(N\_{1}+1\right)\right⌉+⌈log\_{2}\left(N\_{2}+1\right)⌉$$ | Option 1‘:Option 1 with no full UL slot indication$$\left⌈log\_{2}\left(N\_{1}N\_{2}\right)\right⌉⌉$$ | Option 2‘:Option 2 with no full UL slot indication$$\left⌈log\_{2}N\_{1}\right⌉+⌈log\_{2}N\_{2}⌉$$ |
| 0.5 | 0.5 | 4 | 4 | 5 | 6 | 4 | 4 |
| 0.625 | 0.625 | 5 | 5 | 6 | 6 | 5 | 6 |
| 1 | 1 | 8 | 8 | 7 | 8 | 6 | 6 |
| 0.5 | 2 | 4 | 16 | 7 | 8 | 6 | 6 |
| 2 | 0.5 | 16 | 4 | 7 | 8 | 6 | 6 |
| 1.25 | 1.25 | 10 | 10 | 7 | 8 | 7 | 8 |
| 1 | 3 | 8 | 24 | 8 | 9 | 8 | 8 |
| 3 | 1 | 24 | 8 | 8 | 9 | 8 | 8 |
| 2 | 2 | 16 | 16 | 9 | 10 | 8 | 8 |
| 1 | 4 | 8 | 32 | 9 | 10 | 8 | 8 |
| 4 | 1 | 32 | 8 | 9 | 10 | 8 | 8 |
| 2 | 3 | 16 | 24 | 9 | 10 | 9 | 9 |
| 3 | 2 | 24 | 16 | 9 | 10 | 9 | 9 |
| 2.5 | 2.5 | 20 | 20 | 9 | 10 | 9 | 10 |
| 5 | 5 | 40 | 40 | 11 | 12 | 11 | 12 |
| 10 | 10 | 80 | 80 | 13 | 14 | 13 | 14 |

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| NTT DOCOMO | Firstly, how to use each part of X/Y/Z should be clarified. Otherwise, the same discussion in the last meeting would be repeated.We agree with the direction of CMCC’s proposal, i.e. in some cases, UL slots are indicated with granularity of more than one slot. This direction should be discussed and agreed if possible. Then, the granularity level can be discussed with the size of Z.Similarly, how to X/Y should be clarified. For example, “X = 1 bit with 0 indicates one pattern and 1 indicates two patterns. Y = 4 bits, where one value from {0.5, 0.625, 1, 1.25, 2, 2.5, 4, 5, 10} is indicated with 0000 = 0.5, 0001 = 0.625, etc. for one pattern, …” something like this. |
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