**3GPP TSG RAN WG1 #104-e R1-21xxxxx**

**e-Meeting, January 25th – February 5th, 2021**

**Agenda Item: 6.2.2**

**Source: Moderator (ZTE)**

**Title: Summary of email discussion [104-e-LTE-NB\_IoTenh3-02]**

**Document for: Discussion and Decision**

# Introduction

This contribution provides discussion on the following issues:

[104-e-LTE-NB\_IoTenh3-02] Multi-TB issues – Huiying (ZTE)

* Issue#1: Mapping between DCI field and the number of scheduled TB (R1-2100563)
* Issue#2: Determination of number of scheduled TB for SC-MTCH (R1-2100563)
* Discussion and decision by 1/29, TPs by 2/5

# Discussion

**Issue #1: Mapping between DCI field and the number of scheduled TB**

As discussed in section 2.1 of [1], ‘Number of scheduled TB for SC-MTCH’ field indicates the number of scheduled TBs from 1 to 8 TBs. However, only the number of scheduled TBs is defined. The mapping relationship between the value of ‘Number of scheduled TB’ field and the actual number of scheduled TBs is not clear.

***Proposal 1: Endorse Text Proposal #1:***

**------------------------------------------------ Start of Text Proposal # 1 to 36.212 --------------------------------------**

6.4.3.2 DCI Format N1

**<Unchanged parts are omitted>**

Otherwise,

- Scheduling delay – 3 bits as defined in clause 16.4.1 of [3]

- Resource assignment – 3 bits as defined in clause 16.4.1.3 of [3]

- Modulation and coding scheme – 4 bits as defined in clause 16.4.1.5 of [3]

- Repetition number – 4 bits as defined in clause 16.4.1.3 of [3]

- New data indicator – 1 bit. If multiple TB are scheduled, it functions as New data indicator for the first TB.

- HARQ-ACK resource – 4 bits as defined in clause 16.4.2 of [3].

- DCI subframe repetition number – 2 bits as defined in clause 16.6 in [3]

- Number of scheduled TB for SC-MTCH – 3 bits including values 0 to 7 with ascending order indicates the number of scheduled TB from 1 to 8 TBs. This field is only present if higher layer parameter *sc-mtch-InfoListMultiTB-r16* is enabled and the CRC of the DCI is scrambled by G-RNTI.

- Number of scheduled TB for Unicast – 1 bit, where value 0 indicates a single TB is scheduled and value 1 indicates multiple TB are scheduled. This field is only present if higher layer parameter *npdsch-MultiTB-Config* is enabled and the corresponding DCI is mapped onto the UE specific search space given by the C-RNTI as defined in [3]

- HARQ process number – 1 bit. This field is only present if 2 HARQ processes are configured and the corresponding DCI format is mapped onto the UE specific search space given by the C-RNTI as defined in [3], or if Number of scheduled TB for Unicast is present. If multiple TB are scheduled, it functions as New data indicator for the second TB.

- Resource reservation – 1 bit as defined in clause 16.4 of [3]. This field is only present if higher layer parameter *resourceReservationConfigDL* is configured and the DCI is mapped onto the UE-specific search space given by C-RNTI as defined in [3].

**<Unchanged parts are omitted>**

**-------------------------------------------------- End of Text Proposal #1 to 36.212 --------------------------------------**

Please input your views/comments on proposed TP #1 in the following table:

|  |  |
| --- | --- |
| **Companies** | **Views/Comments** |
| FUTUREWEI | This is not an essential correction. We discussed ‘counting from 1’ early in 2020 and determined that for counting from 1 that the current text (used in eMTC and NB-IoT) was sufficient. We also agreed to use this way to describe the format 6-1A ‘Transport blocks in a bundle’ field from Rel-14 in R1-2001333 (i.e., 2 bits indicate from 1 to 4). |
| Nokia, NSB | We do not think this TP is needed. The specification is clear in our view. |
| Qualcomm | Agree with FUTUREWEI and Nokia. |
| Huawei/HiSilicon | Share similar view that no need for this TP, the spec is clear about this mapping. |
| Lenovo, MotoM | Share the similar view as above |
| ZTE | It is still a little bit confused for us since the mapping relationship seems to be not clear in this way. However, if majority companies have the consensus, we are OK to keep it.  |

**Issue #2: Determination of number of scheduled TB for SC-MTCH**

The value of is determined by the Number of scheduled TB for Unicast field for unicast and the value of is determined by Number of scheduled TB for SC-MTCH for multicast according to subclause 6.4.3.2 in TS36.212.

However, in current TS36.213, the NPDSCH transmission in *N* consecutive NB-IoT DL subframes based on theis only used for unicast, since the  is determined by the Number of scheduled TB for Unicast field. The TB number description determined by Number of scheduled TB for SC-MTCH for multicast is missing when determining the NPDSCH transmission in *N* consecutive NB-IoT DL subframes.

***Proposal 2: Endorse Text Proposal #2.***

**------------------------------------------------ Start of Text Proposal #2 to 36.213 ---------------------------------------**

16.4.1 UE procedure for receiving the narrowband physical downlink shared channel

**<Unchanged parts are omitted>**

- , where the value of  is determined by the repetition number field in the corresponding DCI (see Subclause 16.4.1.3), the value of is determined by the resource assignment field in the corresponding DCI (see Subclause 16.4.1.3), and the value of is determined by the Number of scheduled TB for Unicast field or Number of scheduled TB for SC-MTCH field, if present, in the corresponding DCI,  otherwise,

**--------------------------------------------------- End of Text Proposal #2 to 36.213 -------------------------------------**

Please input your views/comments on proposed TP #2 in the following table:

|  |  |
| --- | --- |
| **Companies** | **Views/Comments** |
| Nokia, NSB | We support this TP. |
| Qualcomm | We are OK with the TP. |
| Huawei/HiSilicon | Support this TP. |
| Lenovo, MotoM | Support this TP. |
| ZTE | OK to endorse this TP. |

# Summary

**References**

[1] 3GPP, R1-2100563, Clarifications on scheduling enhancement for NB-IoT, RAN1 #104-e, ZTE