**3GPP TSG RAN WG1 Meeting #107-e R1-210xxxx**

**Nov 11th – 19th, 2021**

**Agenda item: 7.2.2**

**Source: Moderator (Qualcomm Incorporated)**

**Title: Preparation phase email discussion for NR-U**

**Document for: Discussion and Decision**

# Introduction

The paper summarizes the preparation phase email discussion for contribution submitted to 7.2.2 on NR-U CR under the following email thread

* [107-e-Prep-AI7.2.2] Preparation phase for Rel-16 NR-U maintenance: Jing (Qualcomm)

# Issues identified

This section lists the issues discussed in submitted papers. I tried to put them under technical proposal or editorial proposal categories, but I might be wrong though.

Issues may need technical discussion:

|  |  |  |  |
| --- | --- | --- | --- |
| Issue ID | Brief summary | Summarydocument | Supporting document |
| T1 | Channel access updates for MIIT | [2] | [1]. CR for 37.213[3]. CR for 38.212 |
| T2 | CG-UCI multiplexing condition | [4] | [4]. CR for 38.212 |
| T3 | Freq hopping for single/multi-PUSCH | [5], [8] | [9]. CR for 38.214 |
| T4 | Channel access for consecutive UL transmission | [6] | [7]. CR for 37.213 |
| T5 | Correction on unit of CP extension | [12] | [12]. CR for 38.211 |
| T6 | UL transmission in wideband operation | [13] | [13]. CR for 37.211 |
| T7 | Discussion on LS from RAN4 on measing CSI-RS during SCell activation | [14] |  |
| T8 | Changes of channel access procedure in TS 37.213 | [16] | [16]. CR for 37.213 |
| T9 | On additional PDSCH DM-RS dropping with double symbol | [17] | [17]. CR for 38.211 |

Issues more editorial in nature:

|  |  |  |  |
| --- | --- | --- | --- |
| Issue ID | Brief summary | Summarydocument | Supporting document |
| E1 | Correct IE name for availableRB-SetsToReleaseList | [10] | [10]. CR for 38.213 |
| E2 | Type 3 HARQ codebook construction, change “HARQ process number h” to “HARQ process h” | [11] | [11]. CR for 38.213 |
| E3 | Correction on usage of subCarrierSpacingCommon for unlicensed | [15] | [15]. CR for 38.213 |
| E4 | Correction on UL channel access procedure Type 2A/2B/2C | [18] | [18]. CR for 37.213 |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

# Discussion on which CR to treat

Please provide your view below. “Y” to discuss.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Company | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 |
| MTK | Y | Y | Y | Y  | Y | Y | Y | Y | Y |
| Ericsson |  | Y (OK with 1st change) | Y |  |  | Y | N | Y |  |
| LG Electronics |  | Y (but the second change doesn’t seem to be needed) | Y |  | Y | Y |  | Y | Y |
| Transsion | Y | Y | Y |  |  | Y |  | Y | N |
| Huawei, HiSilicon | Y, comment below | Y, response to LG below | Y |  | Comment below | Y |  | Y | resolved in RAN1#104, |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Company | E1 | E2 | E3 | E4 |
| MTK | Y | Y | Y | Y |
| Ericsson | Y | N | Y | N |
| LG Electronics | Y | Y | Y | Y |
| Transsion | Y | Y | Y | Y |
| Huawei, HiSilicon | Y | Y | Y | Comment below |

Other comments:

|  |  |
| --- | --- |
| **Company Name** | **Comments**  |
| MTK | For T9, we are trying to discuss the issue about additional PDSCH DM-RS dropping with double symbol. With the Rel-16 NR-U introduced Type B PDSCH duration $l\_{d}$ $\in \left\{8,9,10,11,12,13\right\}$:In some condition, only the second symbol of an additional double-symbol DM-RS is out of bound according to current Rel-16 RAN1 spec, and it breaks the orthogonality of orthogonal cover code (OCC) applied on the DM-RS. As a result, we prefer to adopt Alt 1 below (drop both symbols when the second symbol of DMRS is out of bound) to avoid this kind of scenario. |
| Ericsson | T7: This issue has been discussed for 3 meetings now (one of them in Rel-15 maintenance) without consensus. We see little point in continuing the discussion which will end up with the same result. |
| Transsion | T9: This issue has been discussed and identified at the RAN1#104-e meeting, and the intention of the final CR R1-2102009 is the same as that of MTK. In current specification, “for all values of the PDSCH duration *l*d other than 2, 5, and 7 symbols, the UE is not expected to receive DM-RS beyond the (*l*d - 1):th symbol” means that for double-symbol DMRS, the UE is not expected to receive the two DM-RS symbols. The language “DM-RS” highlighted in yellow in current spec is for simplicity and to be consistent with the description in “if the PDSCH duration $l\_{d}$ is 12 or 13 symbols, the UE is not expected to receive DM-RS mapped to symbol 12 or later in the slot”. Hence, we believe that this issue should not be discussed again.  |
| MTK2 | Thanks Transsion for pointing out that T9 is already discussed before and had a corresponding CR R1-2102009. The information is very helpful to us. We agree with Transsion that T9 is **not** needed to be discussed again in RAN1 #107e. |
| Huawei, HiSilicon | **T1:** The new regulation for 2.4GHz, 5.1GHz and 5.8GHz in China was formally issued on Sept 8. It will take effect from Jan 1 2022. Current FBE mechanism did not conform to the regulation and should be resolved.**T2:** As for the 2nd change, the current spec allocate all RE of PUSCH to CG-UCI, CSI-part- 1 and CSI-part-2. There is no space for CG-PUSCH.**T5:** We think this correction is inaccurate as$T\_{ext}$ is used for defining the time interval $t\_{start,l}^{μ}-T\_{ext}\leq t<t\_{start,l}^{μ}$ on which the extension **time-continuous** signal $s\_{ext}^{(p,μ)}\left(t\right)$ is generated from the discrete samples using Tc. Therefore, $Δ\_{i}$ should be also calculated in a time-continuous manner which also captures the gap duration accurately. Then, the calculation of the signal $\overbar{s}\_{l}^{(p,μ)}\left(t\right)$ takes care of the Tc time unit. **E4:** This clarifying editorial can be handled, if needed, without deletion |

# Reference

1. R1-2110822, Changes of channel access procedure in TS 37.213 according to MIIT regulation, Huawei, HiSilicon
2. R1-2110823, Discussion on the impact of MIIT consultation to channel access procedure, Huawei, HiSilicon
3. R1-2110824, Changes of channel access types tables in TS 38.212, Huawei, HiSilicon
4. R1-2110825, Corrections on CG-UCI multiplexing in TS38.212, Huawei, HiSilicon
5. R1-2110826, Discussion on the frequency hopping for single/multi PUSCH transmission, Huawei, HiSilicon
6. R1-2110974, Discussion on channel access procedures for consecutive UL transmissions, vivo
7. R1-2110975, Correction on channel access procedures for consecutive UL transmission(s), vivo
8. R1-2110977, Discussions on frequency hopping for PUSCH,PUCCH and SRS, vivo
9. R1-2110978, Draft CR on 38.214 on frequency hopping for multi-PUSCH scheduling by a single DCI, vivo
10. R1-2111082, Correction on slot configuration in TS 38.213, ZTE, Sanechips
11. R1-2111339, Correction on Type-3 HARQ-ACK codebook, OPPO
12. R1-2111340, Draft CR for correction on unit of CP extension, OPPO
13. R1-2111461, UL Transmissions in Wideband Operation, Ericsson, Nokia, NSB, LG Electronics, Qualcomm, Huawei, HiSilicon
14. R1-2111462, Discussion on LS from RAN4 on measing CSI-RS during SCell activation, Ericsson
15. R1-2111714, Correction on usage of subCarrierSpacingCommon for unlicensed, Samsung
16. R1-2111927, Changes of channel access procedure in TS 37.213, Huawei, HiSilicon
17. R1-2112294, On additional PDSCH DM-RS dropping with double symbol, MediaTek Inc.
18. R1-2112350, Correction on UL channel access procedure Type 2A/2B/2C , Lenovo, Motorola Mobility, ZTE, Sanechips, Xiaomi, Intel, OPPO