**3GPP TSG-RAN WG1 Meeting #108-e R1-220xxxx**

**e-Meeting, February 21st - March 3rd, 2022**

**Agenda Item: 5.2**

**Source: Moderator (ZTE)**

**Title: Comments collection on RRC parameters for small data transmission**

**Document for: Discussion**

# Introduction

This summary is to collect comments for RRC parameters for SDT work item. The RRC parameters have been captured in the excel sheet in the same draft folder.

[108-e-R17-RRC-SDT] Email discussion on Rel-17 RRC parameters for SDT – Ziyang (ZTE)

* 1st check point for first LS in [108-e-R17-RRC]: February 24
* Final check point for second LS in [108-e-R17-RRC] if necessary: March 3

# Unstable parameters

## Discussion

In RAN1#107-e meeting, a list of RRC parameters are provided and some of them are considered as unstable, in this meeting, these unstable parameters will be discussed in another email thread [108-e-R17-SDT-01] and if agreements can be achieved, the corresponding changes will be updated in excel sheet and this document.

To better track the changes, the latest version of unstable parameters are copied in the following table:

Table-1 latest version of unstable parameters

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| --- | --- | --- | --- |
| Row index | Parameter name in the spec | Description | Comment |
| 10 | repK | Number of repetitions K | Note: It depends on RAN1's decision on repetitions. |
| 11 | repK-RV | The redundancy version (RV) sequence to use. | Note: It depends on RAN1's decision on repetitions. |
| 12 | antennaPort | Indicates the antenna port(s) to be used for this configuration, and the maximum bitwidth is 5. Indicates the subset of antenna port(s) to be used for SSB to CG PUSCH mapping for CG-SDT. | Agreement Support multiple DMRS resources per CG configuration when single layer PUSCH transmission is assumed, and each DMRS resource could be mapped to the same or different SSB(s) FFS if multi-layer PUSCH transmission is supported for CG-SDT FFS any limitation on the DMRS configuration if multiple CG PUSCH occasions per CG period is supported |
| 13 | precodingAndNumberOfLayers | The number of layers for CG-SDT is 1. | Agreement Multi-layer PUSCH transmission is not supported for CG-SDT. |
| 14 | srs-ResourceIndicator | Indicates the SRS resource to be used. It is not applicable for CG-SDT. | Note: SRI may no t be needed for CG-SDT. |
| 16 | pusch-RepTypeIndicator-r16 | Indicates whether UE follows the behavior for PUSCH repetition type A or the behavior for PUSCH repetition type B for each Type 1 configured grant configuration. The value pusch-RepTypeA enables the 'PUSCH repetition type A' and the value pusch-RepTypeB enables the 'PUSCH repetition type B' . | Note: It depends on RAN1's decision on repetitions. |
| 17 | frequencyHoppingPUSCH-RepTypeB-r16 | Indicates the frequency hopping scheme for Type 1 CG when pusch-RepTypeIndicator is set to 'pusch-RepTypeB' . The value interRepetition enables 'Inter-repetition frequency hopping', and the value interSlot enables 'Inter-slot frequency hopping'. If the field is absent, the frequency hopping is not enabled for Type 1 CG. | Note: It depends on RAN1's decision on repetitions. |
| 24 | uci-OnPUSCH | Selection between and configuration of dynamic and semi-static beta-offset. For Type 1 UL data transmission without grant, uci-OnPUSCH should be set to semiStatic. | Note: It's up to RAN2 to determine whether this parameter can be used for CG-SDT. |
| 33 | dmrs-SeqInitialization | The network configures this field if transformPrecoder is disabled. Otherwise the field is absent. [For CG-SDT, {0,1} can be configured to have 2 sequences for mapping.] | Agreement Each N of consecutive SSB indexes associated to one CG configuration are mapped to valid CG PUSCH resources ofirst, in increasing order of DMRS resource indexes, where a DMRS resource index DMRSid is determined first in an ascending order of a DMRS port index and second in an ascending order of a DMRS sequence index - second, in increasing order of CG period indexes in the association period |
| 37 | phy-PriorityIndex-r16 | Indicates the PHY priority of CG PUSCH at least for PHY-layer collision handling. Value p0 indicates low priority and value p1 indicates high priority. | Note: The configuration and value range of this parameter can be reused from RAN1's perspective, it's up to RAN2 to decide on whether to separately define this parameter for CG-SDT. |

## Comment

If you have any comments on these unstable parameters, please refer to section 2 in summary of [108-e-R17-SDT-01]. When agreements are made in that email thread, the corresponding changes will be reflected in excel sheet and this document, please companies comment in this section if they have different understanding.

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| Company | View |
| Intel | * Row 10, 11: RAN1 or RAN2 needs to first conclude whether repetition is supported for CG-PUSCH. * Row 12: we suggest to introduce a new parameter to indicate a set of antenna ports for CG-PUSCH. * Row 13: precodingAndNumberOfLayers is not needed. * Row 14: this is not needed. CG-PUSCH transmission is based on SSB-to-PUSCH mapping rule * Row 16 and 17: we do not think repetition type B should be supported for CG-SDT. These two parameters are not needed. * Row 24: we do not think we need to support UCI multiplexing on CG-PUSCH. The small data transmission during CG-SDT is expected not frequent. * Row 33: Suggest to remove this parameter dmrs-SeqInitialization. Add a new parameter similar to MsgA PUSCH, i.e., nrofDMRS-Sequences. * Row 37: we do not think priority indication should be supported for CG-PUSCH during CG-SDT. This parameter is not needed. |
| Qualcomm | 1. Rows 10, 11,16, 17   In NR R15/16, repK and repK-RV were introduced to improve the reliability/latency performance of CG transmissions in connected mode. FFS if they are needed for R17 SDT.   1. Row 12   If a SDT UE supports multiple CG-SDT configurations, multiple DMRS sequences/antenna ports can be provided to UE in RRCRelease message. Whether or not to re-use the configurations in connected mode can be further discussed.   1. Rows 13-14 can be removed 2. Row 24 can be supported 3. Row 33 can be supported 4. We don’t see a strong motivation to support Row 37, but ok to further discuss it when both SRB and DRB are considered in SDT |

# Others

Any other comments?

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| Company | View |
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# Summary

The final proposals will be added later.

# References

1. R1-2112976 Consolidated higher layers parameter list for Rel-17 NR RAN1, Ericsson
2. [R1-2112977 LS on updated Rel-17 LTE and NR higher-layers parameter list](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_107-e/Inbox/drafts/8/%5b107-e-R17-RRC%5d/Final%20output/R1-2112977%20LS%20on%20updated%20Rel-17%20LTE%20and%20NR%20higher-layers%20parameter%20list%20%E2%80%93%20v000.docx) RAN1, Ericsson