**3GPP TSG RAN WG1 #102-e R1-200xxxx**

**e-Meeting, August 17th – 28th, 2020**

Source: moderator (vivo)

Title: Feature lead summary on NRU configured grant enhancement #2

Agenda Item: 7.2.2.2.4

Document for: Discussion and Decision

1. Introduction

After the preparatory week, following issues are recommended for further discussion until 20th August.

1. Remaining issues
   1. Issue 1: RV ID

Option1:

-------------- TP for 38.214 6.1.2.3.1----------------------------------------------------------------------------------

<unchanged part omitted>

The procedures described in this clause apply to PUSCH transmissions of PUSCH repetition Type A with a Type 1 or Type 2 configured grant.

The higher layer parameter *repK-RV* defines the redundancy version pattern to be applied to the repetitions. If *cg-RetransmissionTimer* is provided, the redundancy version for uplink transmission with a configured grant is determined by the UE~~[, except for the redundancy version of the first repetition that is set to 0]~~ . If the parameter *repK-RV* is not provided in the *configuredGrantConfig* and *cg-RetransmissionTimer* is not provided, the redundancy version for uplink transmissions with a configured grant shall be set to 0. If the parameter *repK-RV* is provided in the *configuredGrantConfig* and *cg-RetransmissionTimer* is not provided, for the *n*th transmission occasion among *K* repetitions, *n*=1, 2, …, *K*, it is associated with *(mod(n-1,4)+1)th* value in the configured RV sequence. If a configured grant configuration is configured with *Configuredgrantconfig-StartingfromRV0* set to *‘off’*, the initial transmission of a transport block may only start at the first transmission occasion of the *K* repetitions.

<unchanged part omitted>

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Option2:

-----------------------------------TP2: Start of TP 38.214 section 6.1.2.3.1------------------------------------

6.1.2.3.1 Transport Block repetition for uplink transmissions of PUSCH repetition Type A with a configured grant

The procedures described in this clause apply to PUSCH transmissions of PUSCH repetition Type A with a Type 1 or Type 2 configured grant.

The higher layer parameter *repK-RV* defines the redundancy version pattern to be applied to the repetitions. If *cg-RetransmissionTimer* is provided, and if repK=1, the redundancy version for uplink retransmission with a configured grant is determined by the UE.~~, [except for the redundancy version of the first repetition that is set to 0]~~ If repK>1, the redundancy version is determined by the UE and the UE is not expected to select the redundancy version for all repetitions to 2 or 3. If the parameter *repK-RV* is not provided in the *configuredGrantConfig* and *cg-RetransmissionTimer* is not provided, the redundancy version for uplink transmissions with a configured grant shall be set to 0. If the parameter *repK-RV* is provided in the *configuredGrantConfig* and *cg-RetransmissionTimer* is not provided, for the *n*th transmission occasion among *K* repetitions, *n*=1, 2, …, *K*, it is associated with *(mod(n-1,4)+1)th* value in the configured RV sequence. If a configured grant configuration is configured with *Configuredgrantconfig-StartingfromRV0* set to *‘off’*, the initial transmission of a transport block may only start at the first transmission occasion of the *K* repetitions. Otherwise, the initial transmission of a transport block may start at

- the first transmission occasion of the *K* repetitions if the configured RV sequence is {0,2,3,1},

- any of the transmission occasions of the *K* repetitions that are associated with RV=0 if the configured RV sequence is {0,3,0,3},

- any of the transmission occasions of the *K* repetitions if the configured RV sequence is {0,0,0,0}, except the last transmission occasion when *K≥8*.

<Unchanged parts are omitted>

----------------------------------------End of TP 38.214 section 6.1.2.3.1------------------------------------------

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| --- | --- |
| Company | Comments |
| Qualcomm | Support option 1. The proper RVID choice should be left to UE with and without repK configuration. No need to introduce different behavior |
| ASUSTeK | Support option 1. |
| LG | Support option 1. |
| Ericsson | Support option 1 |
| OPPO | We think that the error case should not be allowed in the specification. Thus, we propose to discuss and to avoid this error case. |
| Intel | Support option 1. |
| Huawei, HiSilicon | Support option 1 |
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* 1. Issue 3: CG-PUSCH repetition

============= Start of TP for TS 38.214 =======================

6.1.2.3 Resource allocation for uplink transmission with configured grant

================ Unchanged Texts Omitted =================

A set of allowed periodicities *P* are defined in [12, TS 38.331]. The higher layer parameter *cg-nrofSlots-r16*, provides the number of consecutive slots allocated within a configured grant period. The higher layer parameter *cg-nrofPUSCH-InSlot-r16* provides the number of consecutive PUSCH allocations within a slot, where the first PUSCH allocation follows the higher layer parameter *timeDomainAllocation* for Type 1 PUSCH transmission or *Time domain resource assignment* field in the activation DCI for Type 2 PUSCH transmission, and the remaining PUSCH allocations have the same length and PUSCH mapping type, and are appended following the previous allocations without any gaps. The same combination of start symbol and length and PUSCH mapping type repeats over the consecutively allocated slots.

================== Unchanged Texts Omitted ================

====================== End of TP for TS 38.214 =======================

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| --- | --- |
| Company | Comments |
| Qualcomm | Support the TP |
| ASUSTeK | Support the TP, and it’s good to clarify “*timeDomainAllocation*” |
| LG | Support the TP. |
| Ericsson | It is better to follow the same wording used in the same section to describe the time domain allocations  PUSCH allocation follows the higher layer parameter *timeDomainAllocation* for Type 1 PUSCH transmission or the higher layer configuration according to [10, TS 38.321], and UL grant received on the DCI for Type 2 PUSCH transmissions, |
| OPPO | Support the TP |
| Intel | We support the TP. |
| Huawei, HiSilicon | Support the TP |
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* 1. Issue 4: TP for DFI related issues

TP#4 for TS 38.213

===================== Start of TP for TS 38.213 ==========================

10.5 HARQ-ACK information for PUSCH transmissions

================== Unchanged Texts Omitted ================

For an initial transmission by a UE of a transport block in a PUSCH configured by *ConfiguredGrantConfig*, if the UE receives a CG-DFI that provides HARQ-ACK information for the transport block, the UE assumes that the transport block was correctly decoded if the HARQ-ACK information value is ACK; otherwise, the UE assumes that the transport block was not correctly decoded.

(Option 1) For a PUSCH transmission scheduled by a DCI format, if the UE receives a CG-DFI that provides HARQ-ACK information for the transport block, the UE assumes that the transport block was correctly decoded if the HARQ-ACK information value is ACK; otherwise, the UE assumes that the transport block was not correctly decoded.

(Option 2) For a PUSCH transmission scheduled by a DCI format, if the UE receives a CG-DFI that provides HARQ-ACK information for the transport block, the UE assumes that at least one of CBG for the transport block was correctly decoded if the HARQ-ACK information value is ACK; otherwise, the UE assumes that the transport block was not correctly decoded.

(Option 3) For a PUSCH transmission scheduled by a DCI format, if the UE receives a CG-DFI that provides information for the transport block, the UE sets CWp = CWmin,p for every priority class if the information value is 1; otherwise, the UE increases CWp for every priority class to the next higher allowed value.

(Option 4) For a PUSCH transmission scheduled for a slot by a DCI format, if a UE is provided *PUSCH-CodeBlockGroupTransmission* for a serving cell, a value of HARQ-ACK information for a transport block of a corresponding HARQ process number is ACK if at least 10% of all the CBGs of PUSCH(s) scheduled by any DCI format in the same slot was correctly decoded; otherwise, a value of HARQ-ACK information is NACK.

For a PUSCH transmission scheduled by a DCI format, HARQ-ACK information for a transport block of a corresponding HARQ process number is valid if a first symbol of the PDCCH reception is after a last symbol of the PUSCH transmission by a number of symbols provided by *cg-minDFIDelay-r16* or, if the PUSCH transmission is over multiple slots,

- after a last symbol of the PUSCH transmission in a first slot from the multiple slots by a number of symbols provided by *cg-minDFIDelay-r16*, if a value of the HARQ-ACK information is ACK.

- after a last symbol of the PUSCH transmission in a last slot from the multiple slots by a number of symbols provided by *cg-minDFIDelay-r16*, if a value of the HARQ-ACK information is NACK.

============ Unchanged Texts Omitted ================

=============== End of TP for TS 38.213 ============================

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| Company | Comments |
| Qualcomm | We prefer option 4 or option 2. The A/N in DFI for scheduled PUSCH was introduced for contention window update. Option 4 provides the most accurate information for that purpose. On the other hand, option 2 is simpler to implement. Option 3 may have the problem if the associated PUSCH is not in reference duration. |
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* 1. Issue 6: NDI field for validation activation/release

TP #1:

----------------------------------------- TP #2 for 38.214 6.1.2.1.1------------------------------------------------------

Table 6.1.2.1.1-1A Applicable PUSCH time domain resource allocation for DCI format 0\_1 in UE specific search space scrambled with C-RNTI, MCS-C-RNTI, CS-RNTI or SP-CSI-RNTI

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| --- | --- | --- | --- | --- |
| *pusch-ConfigCommon* includes *pusch-TimeDomainAllocationList* | *pusch-Config* includes *pusch-TimeDomainAllocationList* | *pusch-Config* includes *pusch-TimeDomainAllocationList* *-ForDCIformat0\_1* | *pusch-Config includes pusch-TimeDomainAllocationList –ForMultiPUSCH* | PUSCH time domain resource allocation to apply |
| No | No | No | No | Default A |
| Yes | No | No | No | *pusch-TimeDomainAllocationList* provided in *pusch-ConfigCommon* |
| No/Yes | Yes | No | No | *pusch-TimeDomainAllocationList* provided in *pusch-Config* |
| No/Yes | No/Yes | Yes | *-* | *pusch-TimeDomainAllocationList-ForDCIformat0\_1* provided in *pusch-Config* |
| No/Yes | No/Yes | - | Yes | *pusch-TimeDomainAllocationList –ForMultiPUSCH provided in pusch-Config* |

-------------------------------------------------END OF TP #2--------------------------------------------------------------

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| Company | Comments |
| Qualcomm | Support the TP |
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1. Conclusion

# References

[1] R1-2005337, “Feature lead summary on NRU configured grant enhancement”, vivo, RAN1#102-e, 17th – 28th Aug, 2020