**3GPP TSG-RAN WG1 Meeting #114 R1-23xxxxx**

**Toulouse, France, 21-25 August, 2023**

**Agenda Item: 9.17**

**Source: Moderator (Huawei)**

**Title: Summary of email discussion [Post114-38.212-NR\_cov\_enh2-Core]**

**Document for: Discussion and Decision**

# Introduction

This document summarizes the discussions on the 38.212 draft CR on further NR Coverage enhancement, and aims to stabilize the 38.212 draft CR.

[Post114-38.212-NR\_cov\_enh2-Core] Email discussion on Rel-18 draft CRs by September 7 – Editors

# First round discussions

This section summarize the first round email discussions on draft CR v00. Companies are encouraged to provide the first round views by 09/05 (Tuesday), 6:00am UTC, then we can update the draft CR accordingly for the next step discussions.

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| *Company* | *View* |
| Intel | Based on the following conclusion, dynamic waveform switching for Type 2 configured grant PUSCH is not supported. We suggest to remove the following highlighted text in the draft CR.

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| - 1 bit if the higher layer parameter *dynamicTransformPrecoderIndicationDCI-0-1* is configured to 'enabled ' and if the UE is configured to monitor DCI format 0\_1 with CRC scrambled by C-RNTI or CS-RNTI or MCS-C-RNTI, where the bit value of 0 indicates that transform precoder is enabled and the bit value of 1 indicates that transform precoder is disabled. For a DCI format 0\_1 with CRC scrambled by CS-RNTI and the value indicated by new data indicator field is 1, or for a DCI format 0\_1 with CRC scrambled by SP-CSI-RNTI, the bit is reserved. - 0 bit otherwise. |

ConclusionThere is no consensus to support “Dynamic waveform switching to PUSCH transmissions with a Type 2 configured grant” in R18.[Chengyan]: Yes the change here is to reflect agreements for CG-PUSCH retransmission. |
| NTT DOCOMO | On Intel’s point above, we agree Type 2 CG is not supported. Meanwhile, we think Editor’s draft here is rather correct. Because we do not think DCI size should be changed depending on RNTI. Our interpretation of the Conclusion is that DWS field (Transform precoder indicator) doesn’t have a valid meaning in its codepoint. It doesn’t necessarily mean the whole field shouldn’t exist. [Chengyan]: Yes as you said above that is the intention to have the sentence for ‘reserved’, though there is a typo in the sentence, “new data indicator field is 1” should be changed to “new data indicator field is 0”, it will be reflected in the next update as below:*For a DCI format 0\_1 with CRC scrambled by CS-RNTI and the value indicated by new data indicator field is 0, or for a DCI format 0\_1 with CRC scrambled by SP-CSI-RNTI, the bit is reserved.*  |
| vivo  | According to following agreement, CS-RNTI is only supported with DWS for retransmissions in CG case:

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| **Agreement**Dynamic waveform switching enhancement in R18 is applicable to PUSCH scheduled by DCI format 0\_1 or 0\_2 in PDCCH with CRC scrambled with C-RNTI, MCS-C-RNTI, or CS-RNTI with NDI=1.* Note: The above does not imply that dynamic switching enhancement in R18 is applicable or not applicable to other cases of PUSCH (e.g. PUSCH transmission with a Type 1 or Type 2 configured grant, PUSCH scheduled by DCI format 0\_0).
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Therefore, some update is needed:

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| Transform precoder indicator – 0 or 1 bit- 1 bit if the higher layer parameter *dynamicTransformPrecoderIndicationDCI-0-1* is configured to 'enabled ' and if the UE is configured to monitor DCI format 0\_1 with CRC scrambled by C-RNTI or CS-RNTI with the value indicated by new data indicator field is 1 or MCS-C-RNTI, where the bit value of 0 indicates that transform precoder is enabled and the bit value of 1 indicates that transform precoder is disabled. ~~For a DCI format 0\_1 with CRC scrambled by CS-RNTI and the value indicated by new data indicator field is 1, or for a DCI format 0\_1 with CRC scrambled by SP-CSI-RNTI, the bit is reserved.~~ - 0 bit otherwise. |

[Chengyan]: Please check my reply to DCM above. Briefly speaking, the sentence you deleted is needed, otherwise it will have impact on PDCCH blind decoding. In addition, “with the value indicated by new data field is 1” should not be added, no matter whether it is CS-RNTI with NDI=0 or CSI-RNTI with NDI=1, the bitwidth here should be 1 bit, just when NDI=0 it is reserved. As I replied to DCM above, I will correct the typo in the next update. For the update below, could you clarify which agreement it is based on?

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| - DMRS sequence initialization – 0 bit if transform precoder is enabled; 1 bit if transform precoder is disabled or if the Transform precoder indicator field is present.  |

Same comments for DCI 0\_2.[Chengyan]: It corresponds to the following agreement. When the field exits, it has to be always 1 bit, since when t transform precoder enabled, it is 1 bit. AgreementFor DCI format 0\_1/0\_2 containing dynamic waveform indication, bit width of each field is set to the maximum between the bit width of the field if transform precoding is disabled and the bit width of the field if transform precoding is enabled, if different.* If, for the waveform indicated in the DCI, the bit width N of a field would be smaller than the bit width of the field set as per the above, UE decodes the field using N least significant bits. If N=0, the UE ignores the field for the indicated waveform.
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| Sharp | Regarding the input by companies, we agree vivo that DWS is supported for CS-RNTI with NDI=1 (retransmission case).Then, reserved bit is necessary for the case with CS-RNTI with NDI = “0” even though it is not supported. [Chengyan]: Right, I will correct the typo in the next update.  |
| CATT | Based on the agreements, our suggestion is as follows. The same applies for DCI format 0\_2.

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| Transform precoder indicator – 0 or 1 bit- 1 bit if the higher layer parameter *dynamicTransformPrecoderIndicationDCI-0-1* is configured to 'enabled ' and if the UE is configured to monitor DCI format 0\_1 with CRC scrambled by C-RNTI or CS-RNTI with the value indicated by new data indicator field is 1 or MCS-C-RNTI, where the bit value of 0 indicates that transform precoder is enabled and the bit value of 1 indicates that transform precoder is disabled. For a DCI format 0\_1 with CRC scrambled by CS-RNTI and the value indicated by new data indicator field is 0~~1~~, or for a DCI format 0\_1 with CRC scrambled by SP-CSI-RNTI, the bit is reserved. - 0 bit otherwise.[Chengyan]: As I replied to vivo above, “with the value indicated by new data field is 1” should not be added, no matter whether it is CS-RNTI with NDI=0 or CSI-RNTI with NDI=1, the bitwidth here should be 1 bit, just when NDI=0 it is reserved. I will correct the typo “new data indicator field is 1” to “new data indicator field is 0” in the next update.  |

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| Nokia, NSB | We share similar view as CATT. Alternatively, we simply replace “1” by “0” in “For a DCI format 0\_1 with CRC scrambled by CS-RNTI and the value indicated by new data indicator field is 0~~1~~, or for a DCI format 0\_1 with CRC scrambled by SP-CSI-RNTI, the bit is reserved.”[Chengyan]: As I replied to CATT above, I will just correct the typo “new data indicator field is 1” to “new data indicator field is 0”.  |
| Intel2 | We agree with other companies that DWS is only supported for CG-PUSCH retransmission. The update from Vivo looks fine with us. We also do not think the following text is needed. [Chengyan]: Please check my reply to vivo above.

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| ~~For a DCI format 0\_1 with CRC scrambled by CS-RNTI and the value indicated by new data indicator field is 1, or for a DCI format 0\_1 with CRC scrambled by SP-CSI-RNTI, the bit is reserved~~ |

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| LGE | We agree with CATT and Nokia’s view such that “For a DCI format 0\_1 with CRC scrambled by CS-RNTI and the value indicated by new data indicator field is 0~~1~~, or for a DCI format 0\_1 with CRC scrambled by SP-CSI-RNTI, the bit is reserved.” in order to support the same size of DCI as much as possible regardless of a specific RNTI. It could prevent unnecessary implementation complexity (E.g., blind detection.) given *dynamicTransformPrecoderIndicationDCI-0-1* configured to 'enabled’. Same comment to “*dynamicTransformPrecoderIndicationDCI-0-2”* |
| Samsung | Regarding the descriptions of - Transform precoder indicator – 0 or 1 bitIn addition to the agreement and conclusion cited by Vivo and Intel, respectively, there is also the following agreement:Agreement (RAN1#112)Dynamic waveform switching in R18 is not applicable to PUSCH transmissions with a Type 1 configured grant.Thus, we suggest the following changes:- 1 bit if the higher layer parameter *dynamicTransformPrecoderIndicationDCI-0-1* is configured to 'enabled ' and if the UE is configured to monitor DCI format 0\_1 with CRC scrambled by C-RNTI ~~or CS-RNTI~~ or MCS-C-RNTI, where the bit value of 0 indicates that transform precoder is enabled and the bit value of 1 indicates that transform precoder is disabled. ~~For a DCI format 0\_1 with CRC scrambled by CS-RNTI and the value indicated by new data indicator field is 1, or for a DCI format 0\_1 with CRC scrambled by SP-CSI-RNTI, the bit is reserved.~~ - 0 bit otherwise.Regarding the following update in the draft CR:

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| - DMRS sequence initialization – 0 bit if transform precoder is enabled; 1 bit if transform precoder is disabled or if the Transform precoder indicator field is present.  |

We have no agreement on this. But, why to add the condition for the presence of the new indicator. Shouldn’t it be “if the Transform precoder indicator field has value 1”? |
| ZTE | We support the revision from CATT to address the case of NDI=0 when CRC is scrambled by CS-RNTI. The reason has been mentioned by NTT DOCOMO that the DCI size should NOT be changed when the same RNTI type is used.[Chengyan]: As I replied to CATT above, I will just correct the typo in the next update. |
| InterDigital | [Try to merge the threads]Agree with the editor that the only correction needed is to change the “1” to “0” in the original editor version. There should not be a condition on the value of NDI for size of the field. |
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# Second round discussions

TBD