**3GPP TSG RAN WG1 Meeting # 110bis-eR1-2210640**

**E-meeting, October 10th – 19th, 2022**

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| *CR-Form-v12.2* |
| **DRAFT CHANGE REQUEST** |
|  |
|  | **38.212** | **CR** | **-** | **rev** | **-** | **Current version:** | **17.3.0** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

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| ***Title:***  | Draft CR on priority of CG-UCI |
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| ***Source to WG:*** | Moderator (OPPO), ITRI, Huawei, HiSilicon |
| ***Source to TSG:*** | R1 |
|  |  |
| ***Work item code:*** |  |  | ***Date:*** | 2022-10-18 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-17 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
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| ***Reason for change:*** | According to RAN1#109e agreement, when *cg-UCI-Multiplexing* is enabled, the CG-UCI has the same priority as the PUSCH.**Agreement**When *cg-UCI-Multiplexing* is enabled, for PUSCH with CG UCI multiplexing with HARQ-ACK, if any,* CG-UCI has the same priority as the PUSCH.
* Treat the CG-UCI of a certain priority as if a HARQ-ACK of the same priority.
* Joint encode CG-UCI with HARQ-ACK of the same priority if it exists.
* Then reuse the existing multiplexing rules.

However, according to current specification, the rate matching procedure should consider the case of CG-UCI associated with priority index 1 when the PUSCH is associated with priority index 0 which is not consistent with the agreement and would introduce unnecessary UE behavior on the rate matching procedure. |
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| ***Summary of change:*** | To remove the condition of rate matching for CG-UCI associated with priority index 1 when the PUSCH is associated with priority index 0. |
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| ***Consequences if not approved:*** | Unnecessary UE behavior in the rate matching procedure. |
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| ***Clauses affected:*** | 6.3.2.4.1.6, 6.3.2.4.2.6 |
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|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** | **Isolated impact analysis:**This CR is based on RAN1’s common understanding, which has no impact on UE behavior.  |
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| ***This CR's revision history:*** | This is the first version for this CR. |

6.3.2.4.1.6 UCI with different priority indexes

**< Unchanged parts are omitted >**

If *uci-MuxWithDiffPrio* is configured, and HARQ-ACK bits associated with priority index 0, HARQ-ACK bits associated with priority index 1 and/or CG-UCI associated with priority index 1, and CSI part 1 if any are transmitted on a PUSCH:

- Perform rate matching for HARQ-ACK with priority index 1 according to clause 6.3.2.4.1.1, by taking HARQ-ACK with priority index 1 as HARQ-ACK and replacing $β\_{offset}^{PUSCH}$ by $β\_{offset}^{HARQ-ACK-HP}$, if HARQ-ACK bits associated with priority index 1 are transmitted without CG-UCI associated with priority index 1.

- Perform rate matching for CG-UCI with priority index 1 according to clause 6.3.2.4.1.4, if CG-UCI associated with priority index 1 is transmitted without HARQ-ACK bits associated with priority index 1.

- Perform rate matching for CG-UCI with priority index 1 and HARQ-ACK with priority index 1 according to clause 6.3.2.4.1.5, if both CG-UCI associated with priority index 1 and HARQ-ACK bits associated with priority index 1 are transmitted, by taking HARQ-ACK with priority index 1 as HARQ-ACK and replacing $β\_{offset}^{PUSCH}$ by $β\_{offset}^{HARQ-ACK-HP}$.

- If CSI part 1 is also transmitted on the PUSCH and the PUSCH is associated with priority index 1,

- Perform rate matching for CSI part 1 according to clause 6.3.2.4.1.2, by taking HARQ-ACK with priority index 1 if any as HARQ-ACK, and taking CG-UCI associated with priority index 1 if any as CG-UCI.

- Perform rate matching for HARQ-ACK with priority index 0 according to clause 6.3.2.4.1.3, by taking HARQ-ACK with priority index 0 as CSI part 2 and replacing $β\_{offset}^{PUSCH}$ by $β\_{offset}^{HARQ-ACK-LP}$, and taking HARQ-ACK with priority index 1 if any as HARQ-ACK, and taking CG-UCI associated with priority index 1 if any as CG-UCI.

- Otherwise,

- Perform rate matching for HARQ-ACK with priority index 0 according to clause 6.3.2.4.1.2, by taking HARQ-ACK with priority index 0 as CSI-part 1 and replacing $β\_{offset}^{PUSCH}$ by $β\_{offset}^{HARQ-ACK-LP},$ and taking HARQ-ACK with priority index 1 if any as HARQ-ACK, and taking CG-UCI associated with priority index 1 if any as CG-UCI.

- Perform rate matching for CSI part 1 according to clause 6.3.2.4.1.3, by taking CSI part 1 as CSI part 2 and replacing $β\_{offset}^{PUSCH}$ by $β\_{offset}^{CSI-part1}$, taking HARQ-ACK with priority index 0 as CSI-part 1 and taking HARQ-ACK with priority index 1 as HARQ-ACK, if CSI part 1 is also transmitted on the PUSCH and the PUSCH is associated with priority index 0.

**< Unchanged parts are omitted >**

6.3.2.4.2.6 UCI with different priority indexes

**< Unchanged parts are omitted >**

If *uci-MuxWithDiffPrio* is configured, and HARQ-ACK bits associated with priority index 0, HARQ-ACK bits associated with priority index 1 and/or CG-UCI associated with priority index 1, and CSI part 1 if any are transmitted on a PUSCH:

- Perform rate matching for HARQ-ACK with priority index 1 according to clause 6.3.2.4.2.1, by taking HARQ-ACK with priority index 1 as HARQ-ACK and replacing $β\_{offset}^{PUSCH}$ by $β\_{offset}^{HARQ-ACK-HP}$, if HARQ-ACK bits associated with priority index 1 are transmitted without CG-UCI associated with priority index 1.

- Perform rate matching for CG-UCI with priority index 1 according to clause 6.3.2.4.2.4, if CG-UCI associated with priority index 1 is transmitted without HARQ-ACK bits associated with priority index 1.

- Perform rate matching for CG-UCI with priority index 1 and HARQ-ACK with priority index 1 according to clause 6.3.2.4.2.5, if both CG-UCI associated with priority index 1 and HARQ-ACK bits associated with priority index 1 are transmitted, by taking HARQ-ACK with priority index 1 as HARQ-ACK and replacing $β\_{offset}^{PUSCH}$ by $β\_{offset}^{HARQ-ACK-HP}$.

- If CSI part 1 is also transmitted on the PUSCH and the PUSCH is associated with priority index 1,

- Perform rate matching for CSI part 1 according to clause 6.3.2.4.2.2, by taking HARQ-ACK with priority index 1 if any as HARQ-ACK, and taking CG-UCI associated with priority index 1 if any as CG-UCI.

- Perform rate matching for HARQ-ACK with priority index 0 according to clause 6.3.2.4.2.3, by taking HARQ-ACK with priority index 0 as CSI part 2 and replacing $β\_{offset}^{PUSCH}$ by $β\_{offset}^{HARQ-ACK-LP}$, and taking HARQ-ACK with priority index 1 if any as HARQ-ACK, and taking CG-UCI associated with priority index 1 if any as CG-UCI.

- Otherwise,

- Perform rate matching for HARQ-ACK with priority index 0 according to clause 6.3.2.4.2.2, by taking HARQ-ACK with priority index 0 as CSI-part 1 and replacing $β\_{offset}^{PUSCH}$ by $β\_{offset}^{HARQ-ACK-LP},$ and taking HARQ-ACK with priority index 1 if any as HARQ-ACK, and taking CG-UCI associated with priority index 1 if any as CG-UCI.

- Perform rate matching for CSI part 1 according to clause 6.3.2.4.2.3, by taking CSI part 1 as CSI part 2 and replacing $β\_{offset}^{PUSCH}$ by $β\_{offset}^{CSI-part1}$, taking HARQ-ACK with priority index 0 as CSI-part 1 and taking HARQ-ACK with priority index 1 as HARQ-ACK, if CSI part 1 is also transmitted on the PUSCH and the PUSCH is associated with priority index 0.

**< Unchanged parts are omitted >**