**3GPP TSG-RAN WG1 Meeting #114bisR1-230xxxx**

**Xiamen, China, October 9th - October 13th, 2023**

**Agenda Item: 6**

**Source: Moderator (Lenovo)**

**Title: Summary on HARQ timing for CEMode B**

**Document for: Discussion and decision**

# Introduction

This document summarizes the discussions during RAN1#114bis agenda 6 on the following CR.

R1-2309791 Draft CR on HARQ timing for CEMode B Lenovo

R1-2309887 Clarification on UL timing for CE Mode B Ericsson

# Discussion

## Summary of the CR

As observed by [Lenovo, Ericsson], for FDD, the HARQ timing for multiple TBs scheduling for UE configured with CEMode B is missing. The corresponding CRs are proposed.

TP1a from Lenovo in R1-2309791

TS36.213

## 10.2 Uplink HARQ-ACK timing

For TDD or for FDD-TDD and primary cell frame structure type 2 or for FDD-TDD and primary cell frame structure type 1, if a UE configured with *EIMTA-MainConfigServCell-r12* for a serving cell, "UL/DL configuration" of the serving cell in Clause 10.2 refers to the UL/DL configuration given by the parameter *eimta-HARQ-ReferenceConfig-r12* for the serving cell unless specified otherwise.

**<Unchanged parts are omitted>**

For FDD, if a BL/CE UE is configured with CEModeA, the UE is not configured with higher layer parameter *harq-AckBundling* in *ce-PDSCH-MultiTB-Config* and multiple TB are scheduled in the corresponding DCI, or if the UE is configured with CEModeB and multiple TB are scheduled in the corresponding DCI, the BL/CE UE shall upon detection of a PDSCH intended for the UE and for which an HARQ-ACK shall be provided, transmit the HARQ-ACK response using the same  derived according to Clause 10.1.2.1 in subframe(s) with , *i =0,1, …, N-1*, where

- is the number of scheduled TB determined in the corresponding DCI;

- if the UE is not configured with higher layer parameter *interleaving* in *ce-PDSCH-MultiTB-Config* and the UE is not in half-duplex FDD operation

- ,

- otherwise

- **,**

**<Unchanged parts are omitted>**

TP2a from Ericsson in R1-2309887

TS36.213

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## 10.2 Uplink HARQ-ACK timing

For TDD or for FDD-TDD and primary cell frame structure type 2 or for FDD-TDD and primary cell frame structure type 1, if a UE configured with *EIMTA-MainConfigServCell-r12* for a serving cell, "UL/DL configuration" of the serving cell in Clause 10.2 refers to the UL/DL configuration given by the parameter *eimta-HARQ-ReferenceConfig-r12* for the serving cell unless specified otherwise.

------------------------------------------ Text Omitted ---------------------------------------------------------

For FDD, if a BL/CE UE is configured with CEModeA or CEModeB, and if the UE is not configured with higher layer parameter *harq-AckBundling* in *ce-PDSCH-MultiTB-Config* and multiple TB are scheduled in the corresponding DCI, the BL/CE UE shall upon detection of a PDSCH intended for the UE and for which an HARQ-ACK shall be provided, transmit the HARQ-ACK response using the same  derived according to Clause 10.1.2.1 in subframe(s) with , *i =0,1, …, N-1*, where

## Discussion

**Question 1: Do you agree with the intention of the CR?**

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| --- | --- |
| **Company** | **Comments** |
| Qualcomm | We agree to fix the issue that CEModeB is missing. |
| Huawei, HiSilicon | We agree to fix |
| Lenovo | We agree to fix |
| Ericsson | Yes, we do. |

**Question 2: Do you agree with the any of CR above? If not, what is your proposal?**

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Qualcomm | We slightly prefer a simpler version:  “For FDD, if a BL/CE UE is not configured” |
| Huawei, Hisilicon | QC’s version looks even simpler. |
| Lenovo | If companies believe the update from QC or E/// will not lead to the misunderstanding that UE configured with CEMode B can be configured with HARQ bundling, we are OK with either proposal, QC’s proposal seems simpler. |
| Ericsson | In our contribution R1-2309887 we also mentioned the so called “QC’s version,” the reason we why we did not propose it was because we checked some other clauses (e.g., clause 12) and we found an explicit approach has been used stating “CEModeA or CEModeB,” thus aiming at being consistent with legacy (and to be clear we are incorporating something that was missing) we added “or CEModeB”.  So, we also prefer a simple fix, but including “or CEModeB”:  “For FDD, if a BL/CE UE is configured with CEModeA or CEModeB, and …” |

# References

1. R1-2309791 Draft CR on HARQ timing for CEMode B Lenovo
2. R1-2309887 Clarification on UL timing for CE Mode B Ericsson