3GPP TSG-RAN WG1 Meeting #108-e R1-2xxxxxx

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

Agenda Item: 8.9.2

Source: Moderator (Ericsson)

Title: Moderator Summary [108-e-R17-NB-IoT-eMTC-02]

Document for: Discussion and Decision

# 1 Introduction

As part of the Work Item (WI) on “Additional enhancements for NB-IoT and LTE-MTC” [1] the following enhancement for LTE-MTC was specified in Rel-17:

|  |
| --- |
| * Support additional PDSCH scheduling delay for introduction of 14-HARQ processes in DL, for HD-FDD Cat M1 UEs. [LTE-MTC] [RAN1]
 |

This document summarizes remaining issues on the introduction of 14 HARQ processes in DL for HD-FDD Cat M1 UEs according with [2-5].

# 2 Moderator summary on 14 HARQ processes in DL in LTE-MTC

## 2.1 Usability of the “Repetition number” field

The potential conclusion below was distributed and discussed over the reflector. The last discussion on it took place on “Tue 3/1/2022 3:31 PM”, afterwards no more comments were received. Given that more than 24 hours have passed and no additional comments have been received on it, the potential conclusion below can be considered stable and agreeable.

**Potential Conclusion:**

**In Rel-17 for the 14 HARQ process feature, the use of the “Repetition Number” field was intended to address adverse radio condition where at most 1 HARQ processes along with PDSCH repetitions are suitable to be used.**

* **Other scenarios making use of PDSCH repetitions (e.g., combining the use of repetitions/no-repetitions) are not precluded subject to be compliant to the “PDSCH scheduling delays” and “HARQ-ACK delays” introduced in Rel-17.**

## 2.2 TP on TS 36.211: Editorial on a HL parameter name

This TP was approved by Mr. Chairman on Sat 2/26/2022 5:02 AM and is available in [v1 of the session notes](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_108-e/Inbox/Xiaodong_sessions/Xiaodong%27s%20Session%20Notes%20RAN1%23108-e%20%288.9%20LTE%20NB-IoT%20%26%20eMTC%29%20v01.zip).

The proponent has produced and shared the draft CR and is currently accounting for Editorial comments received on the cover page. The updated version is expected to be distributed soon.

## 2.3 TP on TS 36.213: More specific description on the PDSCH scheduling delay value

This TP was approved by Mr. Chairman on Sat 2/26/2022 5:02 AM and is available in [v1 of the session notes](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_108-e/Inbox/Xiaodong_sessions/Xiaodong%27s%20Session%20Notes%20RAN1%23108-e%20%288.9%20LTE%20NB-IoT%20%26%20eMTC%29%20v01.zip).

The proponent has produced and shared the draft CR and is currently accounting for Editorial comments received on the cover page. The updated version is expected to be distributed soon.

# 5 References

1. [RP-201306](http://www.3gpp.org/ftp/TSG_RAN/TSG_RAN/TSGR_88e/Docs/RP-201306.zip), “WID revision: Additional enhancements for NB-IoT and LTE-MTC”, RAN #88e, Electronic Meeting, June 29th – July 3rd, 2020.
2. [R1-2200977](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_108-e/Docs/R1-2200977.zip), “Support of 14-HARQ processes in DL for HD-FDD MTC UEs,” Huawei, Hisilicon, RAN1# 108-e, e-Meeting, February 21st – March 3rd, 2022.
3. [R1-2201894](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_108-e/Docs/R1-2201894.zip), “Remaining issues for introduction of 14-HARQ processes in DL for eMTC,” ZTE, Sanechips, RAN1# 108-e, e-Meeting, February 21st – March 3rd, 2022.
4. [R1-2202278](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_108-e/Docs/R1-2202278.zip), “Support of 14 HARQ processes in DL in LTE-MTC,” Ericsson, RAN1# 108-e, e-Meeting, February 21st – March 3rd, 2022.
5. [R1-2202369](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_108-e/Docs/R1-2202369.zip), “Support of 14-HARQ processes in DL for eMTC,” Nokia, Nokia Shanghai Bell, RAN1# 108-e, e-Meeting, February 21st – March 3rd, 2022.

# 6 Annexes

## 6.1 Annex A: Compendium of views on the usability of the “Repetition number” field.

|  |  |  |
| --- | --- | --- |
| **Company** | **Please state your views/arguments on which option you prefer: Alt-A or Alt-B** | **Comments** |
| Qualcomm | Alt-A | There is unclear need to modify the legacy behavior. |
| Lenovo, MotoM | Alt-A | We slightly prefer to follow the legacy behavior that if the “HARQ-ACK bundling flag” field is set to 1 the UE shall assume that the PDSCH repetitions equal 1, and “Repetition Number” field is pending as legacy. |
| Nokia, NSB | Alt-A | Same reason as Qualcomm |
| Huawei, HiSilicon | Alt-B | There is no need to limit the usage of “repetition number” field since the 2-bits field cannot be removed for 14-HARQ processes feature. The eNB scheduler can determine the repetition number based on the channel condition, delay of HARQ-ACK feedback and the overhead of PUCCH resources. |
| ZTE, Sanechips | Alt-B | We do not see any benefits to follow the legacy behavior. Moreover, we also can not figure out why repetition should be always set to 1 and the 2bits DCI field are wasted when bundling is configured. |

## 6.2 Annex B: Compendium of views “TP on TS 36.211: Editorial on a HL parameter name”.

|  |  |  |
| --- | --- | --- |
| **Company** | **OK with the Editorial TP on TS 36.211?** | **Comments** |
| Qualcomm |  | We would suggest to wait till RAN2 has finalized the ASN.1 before making editorial changes. |
| Lenovo, MotoM | OK |  |
| Nokia, NSB | OK |  |
| Ericsson |  | To our best knowledge the HL parameter under discussion has been stable in RAN2. We are fine either way, correcting this minor editorial typo now or until ASN.1 has been finalized. |
| Huawei, HiSilicon | OK |  |
| ZTE, Sanechips | OK | We can further confirm it if RAN2 has the conclusion. |

## 6.3 Annex C: Compendium of views “TP on TS 36.213: More specific description on the PDSCH scheduling delay value”.

|  |  |  |
| --- | --- | --- |
| **Company** | **OK with the TP on TS 36.213?** | **Comments** |
| Lenovo, MotoM | OK |  |
| Ericsson | See comment | A similar comment was brought up during the Editor’s CR phase and the Editor argued it was clear enough. If now companies see the need of being more specific, we can be ok with it, but I think that the word that is intended to be added should be written in singular (i.e., “option”) rather than in plural since only one option is used at a time. |
| Huawei, HiSilicon | OK |  |
| ZTE, Sanechips | OK | Using ‘PDSCH scheduling delay’ is not aligned with the spe description as following, which may cause misunderstandingTable 5.3.3.1.12-1: Content of "PDSCH scheduling delay and HARQ-ACK delay for 14 HARQ" for *ce-HARQ-AckDelay* = Alt-2e

|  |  |  |
| --- | --- | --- |
| **Bit field mapped to index** | **PDSCH scheduling delay option****(Table 5.3.3.1.12-3)** | **HARQ-ACK delay****(subframes)** |
| 0 | 0 | 4 |
| 1 | 0 | 5 |
| 2 | 0 | 6 |

|  |  |
| --- | --- |
| **Option** | **Description** |
| 0 | 2 BL/CE DL subframes |
| 1 | 1 BL/CE DL subframe + 1 subframe + 3 BL/CE UL subframes + 1 subframe + 1 BL/CE DL subframe |
| 2 | 1 subframe + 3 BL/CE UL subframes + 1 subframe + 2 BL/CE DL subframes |

As for the wording, we are fine with both ‘option’ and ‘options’ |