3GPP TSG-RAN WG2 #113e Tdoc R2-21xxxxx

Electronic meeting, 2021-01-25 - 2021-02-05

Agenda Item: 6.3.2

Source: Ericsson

Title: Report on [AT113-e][502][NR-U] CRs on NR-U User Plane (Ericsson)

Document for: Discussion, Decision

# 1 Introduction

This document is for collecting input for the following email discussion

* [AT113-e][502][NR-U] CRs on NR-U User Plane (Ericsson)

Scope:

* + - Discuss submitted CRs in the UP AI. Rapporteur will do preliminary assessment on criticality and need to have the CRs and companies can provide their views.

 Intended outcome:

* + - Agreeable CRs

 Deadline for providing comments:

* + - Companies comments/text suggestions and on need/criticality of the CRs– Jan. 27th
		- Rapporteur to make suggestions on which CRs should be pursued further and any possible merges – Jan. 28st
		- Updated CRs (the ones agreed to be pursued) from responsible companies Jan. 29nd

Here companies may provide their feedback.

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| --- | --- |
| **Company** | **Contact name and email** |
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| LG | Seong Kim (sj117.kim@lge.com) |
| Apple | Yuqin Chen (yuqin\_chen@apple.com) |

# 2 Discussion

There are two proposed CRs for 38.321:

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| [R2-2100217](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2100217.zip) | Handling of deprioritized CG PDU when both cg-RetransmissionTimer and lch-basedPrioritization are configured | CATT |
| [R2-2101669](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101669.zip) | Corrections on the start of the configuredGrantTimer | Beijing Xiaomi Mobile Software |

## 2.1 [R2-2100217](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2100217.zip) Handling of deprioritized CG PDU when both *cg-RetransmissionTimer* and *lch-basedPrioritization* are configured

The IIoT WID RP-201310 has the following objectives:

2. Identify potential enhancements to ensure Release 16 feature compatibility with unlicensed band URLLC/IIoT operation in controlled environmentUplink enhancements for URLLC in unlicensed controlled environments [RAN1, RAN2]:

a. Specify support for UE-initiated COT for FBE with minimum specification effort

b. Harmonizing UL configured-grant enhancements in NR-U and URLLC introduced in Rel-16 to be applicable for unlicensed spectrum

Thus, the rapporteur notes that issues with simultaneous configuration of *lch-basedPrioritization* and *cg-RetransmissionTimer* are within the scope of The Rel.-17 WI on IIoT.

The reason for change in [R2-2100217](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2100217.zip) is that *lch-basedPrioritization* and *cg-RetransmissionTimer* may be configured at the same time, while the Rel.-17 IIoT agreement from last RAN2 meeting were:

 7. FFS if LCH based prioritization can be configured with *cg-RetransmissionTimer*

 8. The assumption for Rel-16 is that the network will not configure *autonomousTx and cg-RetransmissionTimer* simultaneously per cell. No optimizations will be pursued to allow the two features be configured together in Rel-16. No CR is needed for this for now.

Thus, the IIoT scope includes simultaneous configuration of *lch-basedPrioritization* and *cg-RetransmissionTimer* and the work on this has already started.

Therefore, the rapporteur suggests that issues with simultaneous configuration of *lch-basedPrioritization* and *cg-RetransmissionTimer* are left for the Rel.-17 WI on IIoT to solve.

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| **Q1 Do companies agree that:*** **The changes proposed in** [**R2-2100217**](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2100217.zip) **are within the scope of Rel-17 WI IIoT and shall be handled there.**
* **No CR required for now.**
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| **Company** | **Y/N** | **Comment** |
| OPPO | Y |  |
| Xiaomi | Y |  |
| Samsung | Y | We have same view as rapporteur. |
| Nokia | Y | We can wait and see how the discussion in REl-17 goes and then check if it could be applicable to Rel-16 as well if needed. |
| Lenovo | Y |  |
| ZTE | Y |  |
| Intel | Y |  |
| Qualcomm | Y |  |
| CATT | Y | We’re OK to follow majority and wait for R17 discussion outcome |
| LG | Y |  |
| Apple | Y |  |

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| **Q2 If answer to Q1 is No, are there any changes needed to** [**R2-2100217**](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2100217.zip)**?** |
| **Company** | **Comment** |
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## 2.2 [R2-2101669](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101669.zip) Corrections on the start of the configuredGrantTimer

In [R2-2101669](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101669.zip) the reason for change is

In the RAN2#105bis meeting, RAN2 made the following agreement for the *configuredGrantTimer* and the *cg-RetransmissionTimer*:

* The configured grant timer is not started/restarted when UL LBT fails on PUSCH transmission for grant received by PDCCH addressed to CS-RNTI scheduling retransmission for configured grant
* The legacy configured grant timer and behaviour is kept for preventing the configured grant overriding the TB scheduled by dynamic grant, i.e. it is (re)started upon reception of the PDCCH as well as transmission on the PUSCH of dynamic grant.
* A new timer is introduced for auto retransmission (i.e. timer expiry = HARQ NACK) on configured grant for the case of the TB previous being transmitted on a configured grant “CG retransmission timer”.
* The new timer is started when the TB is actually transmitted on the configured grant and stopped upon reception of HARQ feedback (DFI) or dynamic grant for the HARQ process.

However according to the current MAC specification, there are several places stating when/how to start the the *configuredGrantTimer* and the *cg-RetransmissionTimer*, which do not align with the above agreements:

* In section 5.4.1, the specification says that the UE always starts/retarts the *configuredGrantTimer* when the UE receives the CS-RNTI PDCCH indicating the HARQ retransmission, regardless of whether the LBT failure occurs or not. In Section 5.4.2.1, the UE only starts/restarts the *configuredGrantTimer* if LBT failure indication is not received (i.e. no LBT failure) for the HARQ retransmission indicated by the CS-RNTI PDCCH.
* In Section 5.4.1, the specification says that for both HARQ new transmssion and HARQ retransmission the UE always starts/retarts the *configuredGrantTimer* when the UE receives the C-RNTI PDCCH regardless of whether the LBT failure occurs or not. In Section 5.4.2.1, the UE only starts/restarts the *configuredGrantTimer* if LBT failure indication is not received (i.e. no LBT failure) for both the HARQ new transmission and the HARQ retransmission indicated by the C-RNTI PDCCH.

The rapporteur notes the agreement

* The legacy configured grant timer and behaviour is kept for preventing the configured grant overriding the TB scheduled by dynamic grant, i.e. it is (re)started upon reception of the PDCCH as well as transmission on the PUSCH of dynamic grant.

And the agreement from RAN2#108:

1. For a HARQ process, the associated CGT timer is only started when the TB using this HARQ process is initially transmitted, and set to the timer value according to the CG configuration used.

These agreements were implemented in the MAC spec in the way that, when a grant is received on PDCCH (addressed to CS-RNTI or C-RNTI), the CGT is started in section 5.4.1 regardless of what happens during LBT when the transmission is later performed.

In the rapporteurs view this is in line with the agreement above and this is correct because these grants are sent from the gNB, and thus the gNB knows there shall be a transmission (besides if skip padding happens or UE do not detect the PDCCH correct or UE experience LBT failure) and can take appropriate actions like scheduling a retransmission.

In the rapporteurs view no change is needed in 5.4.1.

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| **Q3 Do companies agree that the changes to 5.4.1 as proposed in** [R2-2101669](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101669.zip) **are NOT needed?**  |
| **Company** | **Y/N** | **Comment** |
| OPPO | Y |  |
| Xiaomi | N | The UE behaviours in Section 5.4.1 and Section 5.4.2.1 are contradict with each other. It is not clear which behaviour/section the UE should follow. |
| Samsung | Y | We have same view as rapporteur. |
| Nokia | Y | We have same view as rapporteur. |
| Lenovo | Y | Agree with rapporteur |
| ZTE | Y | Agree with rapporteur |
| Intel | Y | Agree with rapporteur |
| Qualcomm | Y | Agree with the rapporteur |
| CATT | Y | Agree with rapporteur |
| LG | Y | Agree with rapporteur |
| Apple | Y |  |

In section 5.4.2.1 the CGT will only be started/restarted if LBT succeeds as noted in [R2-2101669](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101669.zip).

The starting of the CGT timer was thoroughly discussed during the NR-U WI phase, and in the view of the rapporteur, it is not necessary to differentiate the starting of CGT between dynamic grant (addressed to C-RNTI or CS-RNTI) or a configured uplink grant in 5.4.2.1 even though this is not exactly according to the agreement:

* The legacy configured grant timer and behaviour is kept for preventing the configured grant overriding the TB scheduled by dynamic grant, i.e. it is (re)started upon reception of the PDCCH as well as transmission on the PUSCH of dynamic grant.

Therefor the rapporteur proposes to not implement the changes in 5.4.2.1.

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| **Q4 Do companies agree that the changes to 5.4.2.1 as proposed in** [R2-2101669](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101669.zip) **are NOT needed?**  |
| **Company** | **Y/N** | **Comment** |
| OPPO | Y |  |
| Xiaomi | N | The specification text should follow the RAN2 meeting agreements, not the rapporteur’s preference. |
| Samsung | Y | We have same view as rapporteur. |
| Nokia | Y | No change is needed. 5.4.1 is about PDCCH reception which does not depends on LBT results and 5.4.2.1 is about PUSCH transmission which depends on LBT failure. Prefer not to change since it is NBC. |
| Lenovo | Y | There is no issue with the current specification. |
| ZTE | Y | Same view as rapporteur |
| Intel | Y | Agree with rapporteur |
| Qualcomm | Y | Agree with the rapporteur |
| CATT | Y | Agree with rapporteur |
| LG | Y | The CR is not required at this moment. If addressed in Rel-17, then it can be considered based on it. |
| Apple | Y |  |

# 3 Conclusions

Based on the company feedback the following is proposed