**3GPP TSG-RAN WG2 Meeting #113 electronic *R2-210xxxx***

**Online, Jan 25th – Feb 5th, 2021**

Agenda Item: 6.5.3

Source: ASUSTeK

Title: Report of [AT113-e][024][IIOT] User Plane II (Asus)

Document for: Discussion and Agreement

 Introduction

This is to report the result of the following email discussion in RAN2#113-e Meeting [1]:

* [AT113-e][024][IIOT] User Plane II (Asus)

 Scope: Treat R2-2100713, R2-2100854, R2-2101529, R2-2101530, R2-2101744, R2-2101745, R2-2101746, R2-2101670

 Phase 1, determine agreeable parts, Phase 2, for agreeable parts Work on CRs.

 Intended outcome: Report and Agreed CRs if any is agreeable.

 Deadline: Schedule A

2 Contact Information

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| --- | --- |
| Company | Contact: Name (E-mail) |
| ASUSTeK | Xinra Kung (Xinra\_Kung@asus.com) |
| ZTE | Dong Fei (dong.fei@zte.com.cn) |
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# 3 Discussion

## 3.1 Clarification of conditions for autonomous transmission

R2-2100713 Clarification of conditions for autonomous transmission Nokia, Nokia Shanghai Bell CR Rel-16 38.321 16.3.0 1020 - F NR\_IIOT-Core

This CR proposes to change “was not prioritized” to “was de-prioritized or the PUSCH of which could not be transmitted by the lower layers” to clarify that autonomous transmission is for cases where the previous grant was once considered to be prioritized (and therefore MAC PDU was generated), but then become de-prioritized due to collision with other transmission:

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| 3> else if this uplink grant is a configured grant configured with *autonomousTx*; and3> if the previous configured uplink grant, in the BWP, for this HARQ process was de-prioritized or the PUSCH of which could not be transmitted by the lower layers; and3> if a MAC PDU had already been obtained for this HARQ process; and3> if the uplink grant size matches with size of the obtained MAC PDU; and3> if none of PUSCH transmission(s) of the obtained MAC PDU has been completely performed:4> consider the MAC PDU has been obtained. |

**[Rapporteur’s remark]**

In Phase-1 discussion of [Offline-033][IIOT] MAC Corrections II (Samsung) of R2#111, one issue was pointed out by Lenovo as below that the MAC entity checks only the previous CG which may not be used due to the lack of processing time so Ericsson proposed to change the spec wording from “de-prioritized“ to “not prioritized“.



As for the change of “the PUSCH of which could not be transmitted by the lower layers“, the last condition check in the same place (i.e. if none of PUSCH transmission(s) of the obtained MAC PDU has been completely performed) seems to cover it.

Q1: Do you agree with the change(s) in R2-2100713?

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| --- | --- | --- |
| Company | Agree as is;Agree with changes;Disagree | Detailed Comments |
| ZTE | Disagree | According to the CR , the issue is raised by ‘the term ‘not prioritized’ could be interpreted such that the previous configured grant was **never** considered as a prioritized grant’ We understand it is somewhat over-interpretation it just say that the priority handling procedure result of the previous configured grant is not prioritized and no matter what happened during that process. |
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**Conclusion 1: TBD**

## 3.2 Clarification on HARQ process ID configuration

R2-2100854 Clarification on HARQ process ID configuration Apple discussion Rel-16 NR\_IIOT-Core

According to the current value range of parameters *nrofHARQ-Processes* and *harq-ProcID-Offset2*, since there are no restriction in the specification, it may be possible that a problematic configurations could be provided and HARQ process IDs may exceed the number of HARQ processes, and the UE behaviour will be uncertain in both MAC and PHY layers:

Parameter setting:

CG1: nrofHARQ-Processes = 8, harq-ProcID-Offset2 = 11

HARQ process allocation:

CG1: HARQ process 11, 12, 13, 14, 15, 16, 17, 18

Problematic config

This document provides following proposals and proposes to add restrictions in the specification to ensure that the HARQ Process ID is less than the respective maximum number of HARQ processes, for both UL and DL:

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| **Proposal 1: Configuration of *nrofHARQ-Processes,* *harq-ProcID-Offset2-r16* ensures that the HARQ Process ID is less than the respective maximum number of HARQ processes.****Proposal 2: A similar configuration restriction is required for NR-U and DL SPS when *harq-ProcID-Offset* is configured.****Proposal 3: The possible range in the calculation of the HARQ process ID needs to be corrected.** |

**[Rapporteur’s remark]**

The proposal 1 and 2 seem correct. The network should avoid providing such problematic configurations.

Q2-1: Do you agree with the proposals in R2-2100854?

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| **Company** | **Yes/No** | **Detailed Comments** |
| ZTE | Yes for proposal 1 and 2 | It can be guaranteed by the NW configuration, no modification is needed |
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**Conclusion 2-1: TBD**

Q2-2: If the answer to Q2-1 is yes, do you agree the TP proposed in Annex of R2-2100854?

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| Company | Agree as is;Agree with changes;Disagree | Detailed Comments |
| ZTE | Disagree | No TP or CR is needed |
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**Conclusion 2-2: TBD**

## 3.3 CR on the configuredGrantTimer for deprioritized UL grant

R2-2101529 CR on the configuredGrantTimer for deprioritized UL grant ZTE Corporation, Sanechips CR Rel-16 38.321 16.3.0 1043 - F NR\_IIOT-Core

This CR proposes to capture stopping of the *configuredGrantTimer* for the deprioritized configured UL grant in the collision cases that DG vs CG and SR vs CG and CG is deprioritized, while the current specification captures the stopping of the *configuredGrantTimer* only in the collision case when CG vs CG and one of the CG is deprioritized:

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| (5.4.1)1> if this uplink grant is addressed to CS-RNTI with NDI = 1 or C-RNTI:2> if there is no overlapping PUSCH duration of a configured uplink grant which was not already de-prioritized, in the same BWP whose priority is higher than the priority of the uplink grant; and2> if there is no overlapping PUCCH resource with an SR transmission which was not already de-prioritized and the priority of the logical channel that triggered the SR is higher than the priority of the uplink grant:3> consider this uplink grant as a prioritized uplink grant;3> consider the other overlapping uplink grant(s), if any, as a de-prioritized uplink grant(s);3> if the de-prioritized uplink grant(s) is a configured uplink grant configured with *autonomousTx* whose PUSCH has already started:4> stop the *configuredGrantTimer* for the corresponding HARQ process of the de-prioritized uplink grant(s).3> consider the other overlapping SR transmission(s), if any, as a de-prioritized SR transmission(s).(5.4.4)[…]4> consider the SR transmission as a prioritized SR transmission.4> consider the other overlapping uplink grant(s), if any, as a de-prioritized uplink grant(s);4> if the de-prioritized uplink grant(s) is a configured uplink grant configured with *autonomousTx* whose PUSCH has already started:5> stop the *configuredGrantTimer* for the corresponding HARQ process of the de-prioritized uplink grant(s) |

**[Rapporteur’s remark]**

In R2#112, the first proposed change for 5.4.1 was considered and added in the “ [DRAFT] R2-2011075 TS38.321 CR0997 [IIOT][043]“(V1). However, it was removed in V2 based on the comment from Zhe (OPPO)( Tue, 10 Nov 2020 16:58:51 +0000) in email [AT112-e][043][IIOT] MAC II (Nokia) that “ [...] for the following text in the CR, we are not sure whether we need this modification, since for DG vs. CG only one MAC PDU is delivered and only one transmission is allowed accordingly.“. Similar comments may be also valid for the second change for 5.4.4.

Q3: Do you agree with the change(s) in R2-2101529?

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| --- | --- | --- |
| Company | Agree as is;Agree with changes;Disagree | Detailed Comments |
| ZTE | Seems the first change is not needed;Agree with the second change | Thanks to rapporteur for reminding us the first change is not needed. According to the RAN1 conclusion: DG with a higher priority cannot cancel the ongoing CG transmission with a lower priority. It seems the first change is not needed since the scenario is not existing.For the second change, RAN1 have clarified that the SR with a higher priority class can cancel the PUSCH transmission with lower priority class, as shown below:\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 38.213 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*If a UE would transmit the following channels that would overlap in time- a first PUCCH of larger priority index with SR and a second PUCCH or PUSCH of smaller priority index, or - <omit for short>the UE is expected to cancel the PUCCH/PUSCH transmissions of smaller priority index before the first symbol overlapping with the PUCCH/PUSCH transmission of larger priority index.\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 38.213 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Therefore, there is a possibility where the ongoing CG retransmission would be canceled by the SR transmission, thus the corresponding CGRT shall be stopped. The second change is needed. |
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**Conclusion 3: TBD**

## 3.4 Discussion on timer control when CG transmission is cancelled

R2-2101530 Discussion on timer control when configured grant transmission is canceled ZTE Corporation, OPPO discussion Rel-16 NR\_IIOT-Core

This document discusses when a CG transmission is cancelled (by CI-RNTI or by UCI transmission), there could be misalignment on timer status between UE and NW due to different interpretations on the wording “when a MAC PDU is transmitted”. The document has the following proposal to (re)start the bwp-InactivityTimer and sCellDeactivationTimer when the ongoing CG transmission is cancelled:

**Proposal 1: When the ongoing PUSCH transmission for a configured grant is canceled as specified in subclause 5.4.1, the *bwp-InactivityTimer and sCellDeactivationTimer* shall be (re)started.**

**[Rapportuer’s remark]**

It seems better to have an aligned behavior on whether to start the bwp-InactivityTimer and sCellDeactivationTimer when the corresponding transmission is not completely transmitted.

Q4-1: Do you agree with the proposal in R2-2101530?

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| Company | Yes/No | Detailed Comments |
| ZTE | Yes | We think this clarification is needed, as for whether to have a CR we can following majorities. |
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**Conclusion 4-1: TBD**

Q4-2: If the answer to Q4-1 is yes, do you agree the TP proposed in Annex of R2-2101530?

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| Company | Agree as is;Agree with changes;Disagree | Detailed Comments |
| ZTE | Agree as is | We can follow the majorities. |
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**Conclusion 4-2: TBD**

## 3.5 CG timer handling upon PUSCH cancellation for bundle case

R2-2101744 Configured grant timer handling upon PUSCH cancellation for bundle case ASUSTeK CR Rel-16 38.321 16.3.0 1047 - F NR\_IIOT-Core

In the previous meeting, it was agreed that a configured grant timer that has started should be stopped when a CG PUSCH configured with autonomous transmission with the corresponding HARQ process has been deprioritized or cancelled so that UE can directly use the next configured grant for autonomous transmission. However, if the cancelled PUSCH is a retransmission (e.g. bundle repetition) of configured grant and its previous PUSCH(s) of the same TB has been transmitted completely, configured grant timer would be still stopped. The TB may be directly replaced by another new data in the next configured grant opportunity (rather than sending the same TB by autonomousTx, since the TB has been transmitted completely), which is not desirable from gNB retransmission scheduling perspective:



On the other hand, if the cancelled PUSCH is the first transmission of configured grant (e.g. the first repetition within bundle) and its later PUSCH(s) of the same TB has been transmitted completely, configured grant timer is still kept stopped, and the TB will also be replaced in the next configured grant opportunity:



The CR proposes to:

1. Stop configured grant timer, if the corresponding PUSCH is cancelled/deprioritized and none of previous PUSCH transmission(s) of the TB has been completely performed:

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| (5.4.1)For the MAC entity configured with *lch-basedPrioritization*, if the corresponding PUSCH transmission of a configured uplink grant is cancelled by CI-RNTI as specified in clause 11.2A of TS 38.213 [6] or cancelled by a high PHY-priority PUCCH transmission as specified in clause 9 of TS 38.213 [6], this configured uplink grant is considered as a de-prioritized uplink grant. If this deprioritized uplink grant is configured with *autonomousTx* and none of PUSCH transmission(s) of the obtained MAC PDU has been completely performed, the *configuredGrantTimer* for the corresponding HARQ process of this de-prioritized uplink grant shall be stopped if it is running. |

1. Start configured grant timer, if a retransmission is performed and configured grant timer is not running:

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| 4> if the uplink grant is addressed to CS-RNTI; or4> if the uplink grant is addressed to C-RNTI, and the identified HARQ process is configured for a configured uplink grant; or4> if the *configuredGrantTimer* for the corresponding HARQ process is not running:5> start or restart the *configuredGrantTimer*, if configured, for the corresponding HARQ process when the transmission is performed if LBT failure indication is not received from lower layers. |

**[Rapporteur’s remark]**

The current specification on stopping the configuredGrantTimer upon UL transmission cancellation prohibits the (dynamic) retransmission opportunities of the TBs in the bundle case. The configured grant timer is not effective as expected.

Q5: Do you agree with the changes in R2-2101744?

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| Company | Agree as is;Agree with changes;Disagree | Detailed Comments |
| ZTE | Agree with the change | Generally, we think the first change is needed, but the second change is not needed since the UE anyway will start/restart the configuredGrantTimer when retransmission is performed as shown below:3> else:4> deliver the uplink grant and the HARQ information (redundancy version) of the TB to the identified HARQ process;4> instruct the identified HARQ process to trigger a retransmission;4> if the uplink grant is addressed to CS-RNTI; or4> if the uplink grant is addressed to C-RNTI, and the identified HARQ process is configured for a configured uplink grant; ~~or~~~~4> if the~~ *~~configuredGrantTimer~~* ~~for the corresponding HARQ process is not running:~~5> start or restart the *configuredGrantTimer*, if configured, for the corresponding HARQ process when the transmission is performed if LBT failure indication is not received from lower layers.In addition to above changes, we think the following change is needed instead:1> else if this uplink grant is a configured uplink grant:2> if there is no overlapping PUSCH duration of another configured uplink grant which was not already de-prioritized, in the same BWP, whose priority is higher than the priority of the uplink grant; and2> if there is no overlapping PUSCH duration of an uplink grant addressed to CS-RNTI with NDI = 1 or C-RNTI which was not already de-prioritized, in the same BWP, whose priority is higher than or equal to the priority of the uplink grant; and2> if there is no overlapping PUCCH resource with an SR transmission which was not already de-prioritized and the priority of the logical channel that triggered the SR is higher than the priority of the uplink grant:3> consider this uplink grant as a prioritized uplink grant;3> consider the other overlapping uplink grant(s), if any, as a de-prioritized uplink grant(s);3> if the de-prioritized uplink grant(s) is a configured uplink grant configured with *autonomousTx* whose PUSCH has already started and none of PUSCH transmission(s) of the obtained MAC PDU has been completely performed :4> stop the *configuredGrantTimer* for the corresponding HARQ process of the de-prioritized uplink grant(s).3> consider the other overlapping SR transmission(s), if any, as a de-prioritized SR transmission(s).  |
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**Conclusion 5: TBD**

## 3.6 Corrections for NR IIOT CG confirmation

R2-2101745 MAC Corrections for NR IIOT CG confirmation ASUSTeK CR Rel-16 38.321 16.3.0 1048 - F NR\_IIOT-Core

This CR proposes to

1. Revise bullets to cancel all triggered configured grant confirmation for Multiple Entry Configured Grant Confirmation MAC CE, and cancel a triggered configured grant confirmation for “Single Entry” Configured Grant Confirmation MAC CE:

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| 2> if, in this MAC entity, at least one configured uplink grant is configured by *configuredGrantConfigToAddModList*:3> instruct the Multiplexing and Assembly procedure to generate a Multiple Entry Configured Grant Confirmation MAC CE as defined in clause 6.1.3.31.3> cancel all triggered configured uplink grant confirmation(s).2> else:3> instruct the Multiplexing and Assembly procedure to generate a Configured Grant Confirmation MAC CE as defined in clause 6.1.3.7.23> cancel the triggered configured uplink grant confirmation(s). |

1. To solve ambiguity in setting value for the corresponding CG fields, revise description for CG field in Multiple Entry Configured Grant Confirmation MAC CE to set the CG fields according to triggered and not cancelled configured grant confirmation(s) for a configured uplink grant:
2. Revise decription for when the UE sets the CG field value to 0 for better readability:

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| - CGi: This field indicates whether PDCCH indicating activation or deactivation of configured uplink grant with *ConfiguredGrantConfigIndexMAC* i has been received. The CGi field is set to 1 to indicate that PDCCH the configured uplink grant confirmation with *ConfiguredGrantConfigIndexMAC* i has been triggered and not cancelled; otherwise the CGi field is set to 0. |

**[Rapporteur’s remark]**

For the first change, the „single-entry“ CG confirmation MAC CE should not cancel CG confirmation of other carriers, as in Rel-15 behavior, while only a „multiple-entry“ CG confirmation MAC CE can cancel all CG confirmations.

For the second change, it is ambiguous for the UE to decide whether a (de)activation PDCCH „has been received“ for a configured uplink grant, thus leading to ambiguity in setting value for the corresponding CG fields. It would be clearer to set the field based on triggered and not cancelled CG confirmations, as it’s the similar behavior in setting the C field for LBT failure MAC CE.

Q6: Do you agree with the changes in R2-2101745?

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| Company | Agree as is;Agree with changes;Disagree | Detailed Comments |
| ZTE | Disagree | The current spec is clear, no more clarification is needed. |
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**Conclusion 6: TBD**

## 3.7 Corrections for NR IIOT intra-UE prioritization

R2-2101746 MAC Corrections for NR IIOT intra-UE prioritization ASUSTeK CR Rel-16 38.321 16.3.0 1049 - F NR\_IIOT-Core\

This CR discusses an error case when an uplink grant was a prioritized grant when generating a MAC PDU, but is deprioritized afterwards. The UE will falsely deliver the deprioritized MAC PDU to the HARQ process for transmission, and revises condition of the UE prioritizing UL transmissions to match the same condition of obtaining MAC PDUs to avoid exceptional cases:

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| (5.4.2)3> else if the MAC entity is not configured with *lch-basedPrioritization*; or3> if this uplink grant is a prioritized uplink grant:4> obtain the MAC PDU to transmit from the Multiplexing and assembly entity, if any;3> if a MAC PDU to transmit has been obtained:4> if the MAC entity is not configured with *lch-basedPrioritization*; or4> if the uplink grant is a prioritized uplink grant:5> deliver the MAC PDU and the uplink grant and the HARQ information of the TB to the identified HARQ process; |

**[Rapporteur’s remark]**

If **a MAC entity configured with lch-basedPrioritization** has an dynamic uplink grant that is not a configured grant configured with autonomousTx, and **the uplink grant was a prioritized grant when the MAC PDU is generated but is deprioritized afterwards** (e.g. by a latter overlapping UL configured grant with higher priority data), the UE will falsely deliver the deprioritized MAC PDU to the HARQ process for transmission, according to the current specification.

Q7: Do you agree with the changes in R2-2101746?

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| --- | --- | --- |
| Company | Agree as is;Agree with changes;Disagree | Detailed Comments |
| ZTE | Disagree | We cannot understand the intention of this CR.Our understanding is that: if a grant is prioritized once and the relevant MAC PDU have been generated in MAC, MAC already have delivered the MAC PDU into HARQ process and instructed the identified HARQ process to trigger a new transmission no matter whether this grant is deprioritized finally or not.Furthermore, whether to transmit the generated MAC PDU is up to PHY layer, thus the current spec is OK, no change is needed. |
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**Conclusion 7: TBD**

## 3.8 Corrections on the EHC reset

R2-2101670 Corrections on the EHC reset Beijing Xiaomi Mobile Software CR Rel-16 38.323 16.2.0 0065 - F NR\_IIOT-Core

The CR proposes to specify behaviour of EHC protocol reset for UL and DL in PDCP entity re-establishment with discarding the compression context to avoid decompression failure:

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| (5.1.2)- for UM DRBs and AM DRBs, reset the EHC protocol by discarding the compression context for uplink if *drb-ContinueEHC-UL* is not configured in TS 38.331 [3];[…]- for UM DRBs and AM DRBs, reset the EHC protocol by discarding the decompression context for downlink if *drb-ContinueEHC-DL* is not configured in TS 38.331 [3]; |

Q8: Do you agree with the changes in R2-2101670?

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| Company | Agree as is;Agree with changes;Disagree | Detailed Comments |
| ZTE | Agree as is | We are fine to capture a more clear definition of resetting the EHC protocol. |
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**Conclusion 8: TBD**

# Conclusion

# Reference

[1] 3GPP RAN2#113-e meeting chairman note