3GPP TSG-RAN WG2 Meeting #119 Electronic R2-220xxxx

Elbonia, 17 – 26 August 2022

**Agenda item: 5.1.2**

**Source: Nokia (Rapporteur)**

**Title:** **[****309][R15/16 UP] CRs on UP (Nokia)**

**Document for: Discussion and Decision**

# 1 Introduction

This document is the report of the following email discussion:

* [AT119-e][309][R15/16 UP] CRs on UP (Nokia)

UP open issues and agreeable CRs capturing agreed corrections

Deadline: Monday Aug 22nd, 1000, UTC

[R2-2207896](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2207896.zip) Clarification on BFD while SCell is deactivated Nokia, Nokia Shanghai Bell CR Rel-16 38.321 16.9.0 1347 - F NR\_eMIMO-Core

[R2-2207897](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2207897.zip) Clarification on BFD while SCell is deactivated Nokia, Nokia Shanghai Bell CR Rel-17 38.321 17.1.0 1348 - A NR\_eMIMO-Core

[R2-2207898](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2207898.zip) Clarification on the matching TB size for 2-step RA Nokia, Nokia Shanghai Bell CR Rel-16 38.321 16.9.0 1349 - F NR\_2step\_RACH-Core

[R2-2207899](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2207899.zip) Clarification on the matching TB size for 2-step RA Nokia, Nokia Shanghai Bell CR Rel-17 38.321 17.1.0 1350 - A NR\_2step\_RACH-Core

[R2-2208024](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2208024.zip) Clarification on configuredGrantTimer and cg-RetransmissionTimer Nokia, Nokia Shanghai Bell CR Rel-16 38.321 16.9.0 1362 - F TEI16, NR\_unlic-Core

[R2-2208025](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2208025.zip) Clarification on configuredGrantTimer and cg-RetransmissionTimer Nokia, Nokia Shanghai Bell CR Rel-17 38.321 17.1.0 1363 - A TEI16, NR\_unlic-Core, NR\_SmallData\_INACTIVE-Core

[R2-2208254](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2208254.zip) Correction on RA Resource Selection in Rel-15 vivo CR Rel-15 38.321 15.13.0 1373 - F NR\_newRAT-Core

[R2-2208261](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2208261.zip) Correction on RA Resource Selection in Rel-16 vivo CR Rel-16 38.321 16.9.0 1375 - F NR\_newRAT-Core, NR\_2step\_RACH-Core

[R2-2208263](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2208263.zip) Correction on RA Resource Selection in Rel-17 vivo CR Rel-17 38.321 17.1.0 1376 - A NR\_newRAT-Core, NR\_2step\_RACH-Core

# 2 Contact Points

Respondents to the email discussion are kindly asked to fill in the following table.

|  |  |  |
| --- | --- | --- |
| Company | Name | Email Address |
| Nokia (Rapporteur) | SunYoung LEE | sunyoung.lee@nokia.com |
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| Sequans | Olivier Marco | omarco@sequans.com |

# 3 Discussion

## 3.1 BFD while SCell is deactivated

[R2-2207896](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2207896.zip) Clarification on BFD while SCell is deactivated Nokia, Nokia Shanghai Bell CR Rel-16 38.321 16.9.0 1347 - F NR\_eMIMO-Core

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It is proposed to clarify that BFD is performed only while the SCell is activated so that UE does not unnecessarily perform BFD/BFR and send BFR MAC CE while the SCell is deactivated.

**Question 1**: Do companies agree with the issue? If yes, are the proposed changes fine?

|  |  |  |
| --- | --- | --- |
| Answers to Question 1 | | |
| Company | Agree with the issue? (Yes/No) | If yes, are the proposed changes fine or are there any suggestion for improvement? If no, why? |
| Samsung | No | The source of confusion is that PHY may send beam failure instance indication. This is what RAN1 spec should capture. MAC spec only captures only beam failure recovery for which the current MAC spec is clear. |
| Qualcomm | No | There is no issue, because it is already specified in the RAN4 spec that UE is not required to perform BFD measurements for a deactivated SCell. See clause 8.5.1 in TS 38.133. |
| LG | No | In MAC specification, “Beam failure is detected by counting beam failure instance indication from the lower layers to the MAC entity.” Thus, if beam failure instance indication is not received from PHY, the MAC entity will not detect beam failure. If any clarification is needed, it should be specified in RAN1 specification. |
| Huawei, HiSilicon | No | Agree with above comments |
| CATT | No | Same view as above |
| vivo | No | We agree with Qualcomm.  Specifically, in 38.133 clause 8.5.1, it is stated that **UE is not required to perform beam failure detection outside the active DL BWP**. For an SCell which is deactivated (where no BWP is active), it is quite clear that the RAN4 spec has clarified the intended UE behavior. In this sense, we don’t see the necessity to have repeated clarification in the MAC spec. |
| Lenovo | No | Agree with Qualcomm |
| OPPO | No | Agree that RAN4 has clarified that UE is not required to perform beam failure detection. |
| Intel | No | It doesn’t seem to be essential correction. |
| Apple | No | Agree with QC. The clarification is correct but not necessary because it's already specified in RAN4 spec that the "UE is not required to perform beam failure detection on a deactivated SCell, and also not required to perform beam failure detection on resources which is implicitly configured for a deactivated SCell". |
| PML | Neutral | It doesn’t seem to be essential clarification. |
| NEC | No | same view as comments above on requirement in RAN4 spec as well as L1 aspects |
| Sequans | No strong view | Agree it doesn't seem an issue given RAN4 spec statement but we are ok to clarify in 38.321. |
|  |  |  |

**Summary 1**: TBD.

**Proposal 1**: TBD.

## 3.2 Matching TB size for 2-step RA

[R2-2207898](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2207898.zip) Clarification on the matching TB size for 2-step RA Nokia, Nokia Shanghai Bell CR Rel-16 38.321 16.9.0 1349 - F NR\_2step\_RACH-Core

[R2-2207899](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2207899.zip) Clarification on the matching TB size for 2-step RA Nokia, Nokia Shanghai Bell CR Rel-17 38.321 17.1.0 1350 - A NR\_2step\_RACH-Core

It is proposed to replace 'corresponds to' by 'matches with' because the intention is to check whether the TB size of two TBs are of the same or not.

**Question 2**: Do companies agree with the issue? If yes, are the proposed changes fine?

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| --- | --- | --- |
| Answers to Question 2 | | |
| Company | Yes/No | If yes, are the proposed changes fine or are there any suggestion for improvement? If no, why? |
| Samsung | Yes/No | Not essential, but ok to clarify. No strong view |
| Qualcomm | Neutral | If majority of companies want to change the wording, maybe it can be included in the next rapporteur’s CR. |
| LG | Yes |  |
| Huawei, HiSilicon | No | Not essential, we don’t see any room for misunderstanding on the current wording. |
| CATT | Yes | OK to clarify. |
| vivo |  | No strong view. |
| Lenovo |  | Fine to go with the proposed change. But no strong view. |
| OPPO | No | No issue to use the current wording |
| Intel | No | It is not essential in our view, but is ok if majority wants to clarify. |
| Apple | No strong view | Ok to clarify if majority prefers, but we also think this is not essential. |
| PML | No | It seems “corresponds to” is better than “match with”, because the intention is not exact “equal to” (maybe “greater than”), and “corresponds to” is more flexible.  **In 38.331 r16.9.0:**  GroupB-ConfiguredTwoStepRA-r16 ::= SEQUENCE {  **ra-MsgA-SizeGroupA** ENUMERATED {b56, b144, b208, b256, b282, b480, b640, b800, b1000, b72, spare6, spare5, spare4, spare3, spare2, spare1},  …… ….  }  **Descritption of ra-MsgA-SizeGroupA:**  Transport block size threshold in bits **below** which the UE shall use a contention-based RA preamble of group A. |
| NEC | No strong view | It sees not essential but we follow majority |
| Sequans | No strong view | We can follow majority. |
|  |  |  |

**Summary 2**: TBD.

**Proposal 2**: TBD.

## 3.3 configuredGrantTimer and cg-RetransmissionTimer

[R2-2208024](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2208024.zip) Clarification on configuredGrantTimer and cg-RetransmissionTimer Nokia, Nokia Shanghai Bell CR Rel-16 38.321 16.9.0 1362 - F TEI16, NR\_unlic-Core

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It is explained that the current spec is not clear whether the MAC checks whether the *configuredGrantTimer*/*cg-RetransmissionTimer* is running at the time of PUSCH transmission or at the time when the MAC processes the UL grant. It is proposed to clearly specify that the MAC checks whether the timer is running at the time of corresponding PUSCH transmission, i.e., regardless of when the UE starts processing of the UL grant.

**Question 3**: Do companies agree with the issue? If yes, are the proposed changes fine?

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| --- | --- | --- |
| Answers to Question 3 | | |
| Company | Yes/No | If yes, are the proposed changes fine or are there any suggestion for improvement? If no, why? |
| Samsung | No | Even in Rel-15, UE checks if *configuredGrantTimer* is running immediately before the MAC delivers configuration grant information to the HARQ entity. This is not a Rel-16 specific issue. There is no other way to interpret the current text even if the proposed changes are correct. In our view, the proposed changes are not essential so not needed.  [Samsung2] Also agree with LG’s observation |
| Qualcomm | See comment | We agree that the current spec text is a bit vague and there is room for potential misunderstanding. But we doubt there would be a UE implementation which uses the state of timer at the time of UL grant processing instead of at start of PUSCH Tx when checking the condition.  For R16, since in theory the proposed change is an NBC (if we are not mistaken), make no change to the spec. For R17, we are fine with adopting the proposed change to eliminate the potential ambiguity. |
| LGE | No | The *configuredGrantTimer* is configured as a number of periodicity.  When the *configuredGrantTimer* is set to N, the correct UE behaviour is that new transmission using the CG should be blocked by this running *configuredGrantTimer* only for N\*periodicity. However, if the MAC determines whether *configuredGrantTimer* is running at the time when the MAC processes the UL grant, this would block new transmission for (N+1)\*periodicity and this is different from the original intention. Thus, we think that if the MAC specification is correctly implemented, this already should be based on at the time of PUSCH transmission without this clarification. |
| Huawei, HiSilicon | No | It is obvious that the UE check the CG timer for each CG occasion from the spec, but the time point to check is total up to UE implementation. We tend to believe there is no ambiguity for sensible UE implementation in the field. |
| CATT | No | In our understanding, MAC spec is implementation agnostic and we agree with LGE’s argument. |
| vivo | No | Basically, the internal processing timeline can be left to UE implementation. |
| Lenovo | No | Agree with LG |
| OPPO | No | The timer will stop right before the N+1 CG occasion, our understanding is the N+1 CG occasion can be used for transmission. Whether UE checks the timer at the transmission or at the preparation, it’s up to UE implementation. |
| Intel | No | Agree with comments from other companies. |
| Apple | No | Ok with the intention of the CR, however, the wording is not accurate enough. Other than that, we agree with the comments from others above. |
| PML | No | In the RAN standards, the timers of the MAC and PHY layers are logical clocks, and they should be synchronized. How to implement their synchronization is not the scope of the standards. |
| Sequans | No strong view | The intent seems clear to us, so maybe this clarification is not needed. |
|  |  |  |

**Summary 3**: TBD.

**Proposal 3**: TBD.

## 3.4 RA Resource Selection

[R2-2208254](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2208254.zip) Correction on RA Resource Selection in Rel-15 vivo CR Rel-15 38.321 15.13.0 1373 - F NR\_newRAT-Core

[R2-2208261](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2208261.zip) Correction on RA Resource Selection in Rel-16 vivo CR Rel-16 38.321 16.9.0 1375 - F NR\_newRAT-Core, NR\_2step\_RACH-Core

[R2-2208263](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2208263.zip) Correction on RA Resource Selection in Rel-17 vivo CR Rel-17 38.321 17.1.0 1376 - A NR\_newRAT-Core, NR\_2step\_RACH-Core

It is explained that, during RA procedure, the MAC does not deliver the selected SSB/CSI-RS to the PHY, which results in degraded performance of UL transmission. It is proposed to clarify that the MAC indicates the selected SSB/CSI-RS to the PHY.

**Question 4**: Do companies agree with the issue? If yes, are the proposed changes fine?

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| --- | --- | --- |
| Answers to Question 4 | | |
| Company | Yes/No | If yes, are the proposed changes fine or are there any suggestion for improvement? If no, why? |
| Samsung | No | It is already assumed that this information is already sent to PHY layer. MAC does not capture all relevant cross-layer interaction. No room for misunderstanding. |
| Qualcomm | No | Same view as Samsung. It is not needed, as there is no room for misunderstanding. |
| LGE | No | In section 5.1.3, when the MAC instructs the selected PRACH occasion to the PHY as shown below yellow highlight, we think that the MAC already deliver the selected SSB/CSI-RS information to the PHY because the PRACH occasion is associated with the selected SSB or CSI-RS.  1> instruct the physical layer to transmit the Random Access Preamble using the selected PRACH occasion, corresponding RA-RNTI (if available), PREAMBLE\_INDEX, and PREAMBLE\_RECEIVED\_TARGET\_POWER. |
| Huawei, HiSilicon | No | Agree with above comments. |
| CATT | No | Agree with above comments. If really any clarification would be needed, 38.213 could just refer to MAC spec when mentioning “the PRACH occasions are associated with the selected SS/PBCH block index”. But that is up to RAN1. |
| vivo | Yes |  |
| Lenovo | No |  |
| OPPO | No | No room for ambiguity, and MAC does not need to capture all cross-layer interaction. |
| Intel | No | Agree with above comments that there is no need to capture explicitly about the inter-layer interaction. |
| Apple | No |  |
| PML | Yes | Because the readability of relevant long context in section 5.1.2 of TS 38.321 is not very good, the modification proposed by this CR is meaningful, but it can be further improved as:  1> indicate to lower layers the PRACH occasion with the SSB or CSI-RS selected above |
| NEC | No | This is a kind of obvious UE internal process which we do not normally capture in the spec. |
| Sequans | No | Agree with NEC. |
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**Summary 4**: TBD.

**Proposal 4**: TBD.

## 3.5 RLC Polling

[R2-2206980](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119-e/Docs/R2-2206980.zip) Retransmission SDU choice under double-no condition When T-PollRetransmit expiration PML discussion

It is explained that, when AM RLC entity needs to send polling after t-PollRetransmit expiry, the AM RLC entity may choose the RLC SDU with the highest SN among the RLC SDUs submitted to lower layer for retransmission or any RLC SDU which has not been positively acked for retransmission, which may further results in retransmission delay or unnecessary RRC connection re-establishment. It is proposed that [P1] the AM RLC entity chooses the SDU with the smallest SN (i.e. tx\_next\_ack) for retransmission among the SDUs that have not been positively acknowledged, and further proposed that [P2] the AM RLC entity chooses the SDUs with the largest SN and the TX\_Next\_Ack SN in turn if t-PollRetransmit expires continuously.

**Question 5**: Do companies agree with the issue? If yes, are the proposals (both P1 and P2) fine?

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| --- | --- | --- |
| Answers to Question 4 | | |
| Company | Yes/No | Technical comments |
| Huawei, HiSilicon | No | [To offline rapp] The title of subsection is incorrect, so it is very likely to miss this question when filling the document. I have now corrected it.  We tend to believe the issue mentioned in this contribution is rare case, i.e. the UE encounters an unexpected large RLC SN which implies quite a few RLC PDU have been all missed before. Even this is the case, the UE will start T-reassembly and RLC SR will be triggered upon expiry, so we don't see an issue. If the concern is the the delay of RLC SR, we also believe it can be well handled by proper NW implementation, e.g. a short T-reassembly, and no change to the RLC spec is needed. |
| LGE | No | We don’t see the issue on the assumed situation in this CR.  When the receving side of AM RLC entity receives an RLC SDU including poll in the assumed scenario in the CR, the STATUS report may not be triggered righ away but the *t-reassembly* timer should be started by the condition “- if RX\_Next\_Highest> RX\_Next +1; or”. Then when *t-reassembly* timer expires, RX\_Highest\_Status is updated to the SN of the first RLC SDU with SN >= RX\_Next\_Status\_Trigger for which not all bytes have been received and the STATUS report is triggered and sent to the transmitting side of AM RLC entity. So, the current RLC spec may not perform unnecessary RRC connection re-establishment as address in this CR and no change on SDU choice for retransmission is needed. |
| OPPO | No | Agree with Huawei. |
| Qualcomm | No | We don’t think any change is needed. Even if the highest SN received by the receiver is more than the Next\_Status\_trigger, only t-reassembly amount of time is added to trigger Status PDU at peer level. So there would not be any change in the next highest status PDU SN transmitted as claimed in the document. |
| vivo | No | The current spec can already cover the implementation mentioned by the CR as “or” is used for the two bullets of UE procedural text. So we fail to see the necessity to implement this proposed CR. Otherwise, the eixstiing UE implementation flexibility will be limited.  Upon expiry of *t-PollRetransmit*, the transmitting side of an AM RLC entity shall:  - if both the transmission buffer and the retransmission buffer are empty (excluding transmitted RLC SDU or RLC SDU segment awaiting acknowledgements); or  - if no new RLC SDU or RLC SDU segment can be transmitted (e.g. due to window stalling):  - consider the RLC SDU with the highest SN among the RLC SDUs submitted to lower layer for retransmission; or  - consider tx\_next\_ack or any other RLC SDU which has not been positively acknowledged for retransmission.  - include a poll in an AMD PDU as described in clause 5.3.3.2. |
| Samsung | No | We don’t see this late stage change is needed, especially additional restriction to implementations |
| Intel | No | Agree with others that there is no issue in current specification. |
| Apple | No | Current boundaries have been selected carefully, and they have stable for years. It seems a little late for such a change. In the current RLC, the transmitter can already consider any RLC SDU which has not been positively acknowledged for retransmission. We also agree with the comments from others above. |
| PML | Yes | Thanks for your comments, we fully understand your points of view.  However, in the case where t-Reassembly has been set up in the receiver before receiving the retransmitted highest SN SDU, the Status Report will be delayed until t-Reassembly expiration.  When the t-Reassembly expires, the receiver first updates RX\_Highest\_Status to RX\_Next\_Status\_Trigger, and triggers the Status Report, and finally sets RX\_Next\_Status\_Trigger to RX\_Next\_Highest. At this time, if RX\_Highest\_Status < highest SN, the highest SN will not be included in the Status Report; instead, the receiver will set up a new t-Reassembly timer, with the RX\_Next\_Status\_Trigger set to RX\_Next\_Highest.  When the new t-Reassembly expires, the highest\_SN will be included in a new Status report. In this case, it takes 2 t-Reassembly timeouts for the sender to receive the ack or nack to the highest\_SN. (if t-Reassembly is less than t-StatusProhibit, the spent time will be longer). So the main purpose of our proposal is to trigger the Status Report as early as possible, thus moving the sender window forward and out of the stuttering state quickly.  For the RLC protocol compatibility, the updated correstion proposals are:  - consider the RLC SDU with the highest SN among the RLC SDUs submitted to lower layer for retransmission ，preferentially at even expiry of t-PollRetransmit with the same POLL\_SN; or  - consider tx\_next\_ack or any other RLC SDU which has not been positively acknowledged for retransmission, preferentially at odd expiry of t-PollRetransmit with the same POLL\_SN. |
| NEC | No | As already well explained in earlier comments above, we do not see a need for this change. |
| Sequans | No | It doesn't seem there is an essential issue to fix. |
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**Summary 5**: TBD.

**Proposal 5**: TBD.

# 4 Conclusion

TBD.