3GPP TSG-RAN WG2 Meeting #114 Electronic R2-210xxxx

Elbonia, 19 – 27 May 2021

**Agenda item: 6.1.3.1**

**Source: Nokia (Rapporteur)**

**Title: [AT114-e][018][NR16] MAC III (Nokia)**

**WID/SID: NR\_unlic-Core, NR\_IIOT-Core,** **NR\_IAB-Core, NR\_2step\_RACH-Core, TEI16 - Release 16**

**Document for: Discussion and Decision**

# 1 Introduction

This document is the report of the following email discussion:

* [AT114-e][018][NR16] MAC III (Nokia)

 Scope: Treat R2-2104724, R2-2105231, R2-2105865, R2-2105232, R2-2105749, R2-2106031, R2-2106321, R2-2105851

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

 Intended outcome: Report and Agreed CRs.

 Deadline: Schedule A

# 2 Contact Points

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

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| --- | --- | --- |
| Company | Name | Email Address |
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# 3 Discussion

NR-U

[R2-2104724](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_114-e%5CDocs%5CR2-2104724.zip) LS on SCell activation requirements for NR-U (R4-2105699; contact: Nokia) RAN4 LS in Rel-16 NR\_unlic-Core To:RAN2

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[R2-2105231](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_114-e%5CDocs%5CR2-2105231.zip) Analysis on SCell activation/deactivation requirements for NR-U Huawei, HiSilicon discussion Rel-16 NR\_unlic-Core

No action is required from the RAN4 LS R2-2104724, which also stated in the contribution R2-2105231 “Proposal 1: The RAN4 LS on SCell activation requirements for NR-U has no explicit impacts to RAN2 specs.” Rapporteur propose to note the LS.

**Question 1**: Do companies agree there is no impact to RAN2 from the RAN4 LS and the LS can be noted?

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| Answers to Question 1 |
| Company | Yes/No | Technical Arguments |
| Qualcomm | Yes |  |
| LG | Yes |  |
| Xiaomi | Yes |  |
| Lenovo | Yes |  |
| Nokia | Yes |  |
| vivo | Yes |  |
| ZTE | Yes |  |
| Ericsson | Yes |  |
| CATT | Yes |  |
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**Summary 1**: TBD.

**Proposal 1**: TBD.

The following proposal is proposed in R2-2105231 for *sCellDeactivationTimer* handling in MAC:

**“Proposal 2: If an SCell Activation/Deactivation MAC CE is received deactivating the SCell configured with shared spectrum channel access, UE may stop the *sCellDeactivationTimer* associated with the SCell after the HARQ feedback for the SCell deactivation MAC CE is successfully transmitted. ”**

**Question 2**: Do companies think the change proposed in proposal 2 in R2-2105231 is needed?

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| Answers to Question 2 |
| Company | Yes/No | Technical Arguments |
| Qualcomm | No | The problem described in the paper could happen in theory but it should be a rare event. Even if LBT failure persists for a very long time, it is likely that RLF will be triggered. Lastly, the proposed solution itself is not completely fault proof either, e.g. in the case where there is persistent HARQ feedback failure.  |
| LG | No | Although HARQ feedback is not transmitted due to LBT failure, *sCellDeactivationTimer* will be finally expired and the SCell will be in deactivated state. The statement in TS38.321 should not prevent expiring *sCellDeactivationTimer*. ‘The MAC does not stop *sCellDeactivationTimer*’ is not equal to ‘The MAC prevents *sCellDeactivationTimer* expired’.1> else if an SCell Activation/Deactivation MAC CE is received deactivating the SCell; or1> if the *sCellDeactivationTimer* associated with the activated SCell expires:2> deactivate the SCell according to the timing defined in TS 38.213 [6];2> stop the *sCellDeactivationTimer* associated with the SCell; |
| Xiaomi | No | If the HARQ feedback for the SCell deactivation command is not transmitted due to LBT failure, the UE will trigger “5.21.2 LBT failure detection and recovery procedure”. It seems there is no issue to resolve. |
| Lenovo | No  | Agree with others that in the rare case that LBT failure occurs for very long time, other mechanism will kick in like e.g. LBT failure recovery mechanism |
| Nokia | No | Agree with others. |
| vivo | No with comments | In our understanding, RAN4 specs generally specify the minimum requirement for in the worst case and the current UE behavior in NR-U can satisfy those requirements. In this sense, the CR might be no needed. To say the least, if a change is needed, we think not only the stopping of the *sCellDeactivationTimer*, but also the other operations (e.g. stopping of the *bwp-InactivityTimer*) belonging to Scell deactivation should be also considered. This is because RAN4 specifies the minimum requirement for whole Scell deactivation actions, not just the operation for *sCellDeactivationTimer*. Moreover, considering LBT failure detection is optional and the UE might suffer from consistent LBT failures, then, according to CR, the UE might never a chance to stop the *sCellDeactivationTimer* if LBT always fails. In another word, the proposed solution may lead to a dead-lock issue, which is not preferred. |
| ZTE | No | This is an optimization. The same issue can also occur in the licensed spectrum, such as the poor channel condition (where the MAC CE is lost). In anycase, the LBT failure detection/recovery can resolve this issue.  |
| Ericsson | No | The UE should deactivate the SCell independent of whether it was able to transmit the ACK/NACK or not:TS 38.213 V16.5.0, clause 4.3 (Timing for secondary cell activation / deactivation)With reference to slots for PUCCH transmissions, if a UE receives a deactivation command [11, TS 38.321] for a secondary cell ending in slot , the UE applies the corresponding actions in [11, TS 38.321] no later than the minimum requirement defined in [10, TS 38.133], except for the actions related to CSI reporting on an activated serving cell which the UE applies in slot *.*  |
| CATT | No | We agree with above comments and, in addition, it is specified that the UE will accomplish the deactivation actions for the SCell being deactivated no later than in slot *n+(THARQ+3ms)*/*NR\_slot\_length*. This means this is the maximum time duration and so MAC spec is not inconsistent with RAN4. |
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**Summary 2**: TBD.

**Proposal 2**: TBD.

[R2-2105865](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_114-e%5CDocs%5CR2-2105865.zip) Clarification on prioritization of retransmission over initial transmission for HARQ PID selection in NR-U Nokia, Nokia Shanghai Bell CR Rel-16 38.321 16.4.0 1115 - F NR\_unlic-Core

R2-2105865 proposed to clarify that the UE shall prioritize retransmissions before initial transmissions is only applicable to HARQ PID selection but not for intra-UE prioritization for multiple UL grants, since there has been some different understandings in the context of I-IoT discussions:

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| For configured uplink grants configured with *cg-RetransmissionTimer*, the UE implementation selects an HARQ Process ID among the HARQ process IDs available for the configured grant configuration. For HARQ Process ID selection, the UE shall prioritize retransmissions before initial transmissions. The UE shall toggle the NDI in the CG-UCI for new transmissions and not toggle the NDI in the CG-UCI in retransmissions. |

**Question 3**: Do companies agree with the issue and if yes, are the suggested changes fine or does the text need to be improved / corrected ?

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| Answers to Question 3 |
| Company | Yes/No | Technical Arguments |
| Qualcomm | No | We do not think the reasons for change is correct. The agreement was for grant selection. Moreover, we do not think there is HARQ PID selection for retransmission. |
| LG | Yes | Indeed, it is a necessary clarification. The intention is to prioritize retx over initial when selecting HARQ PID. Regarding QC’s comment, we don’t think there is an intention to select HARQ PID even for retransmission. |
| Xiaomi | No | We understand that the current specification text is to avoid new data flushing the old data in the HARQ process when the cg-RetransmissionTimer expires. However the whole paragraph is under the condition “configured uplink grants configured with *cg-RetransmissionTimer*”. This is definitely not for I-IOT CG. And RAN2 already agreed that the gNB implementation will ensure that no functional collision for the CG handling between NR-U and IIOT, and no CR is needed.* R2 Confirm the assumption that network implementation is to handle the potential ambiguities for R16 UEs, e.g. by not configuring both features at the same time (*cg-RetransmissionTimer* and *autonomousTransmission*). R2 will not further work on this for R16 UEs. No R16 CRs are expected.
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| Lenovo | Yes/No | We agree that the prioritization is for the HARQ process selection, i.e. UE shall prioritize the HARQ process with pending retransmission over a different HARQ process used for initial transmission. However we are not sure whether the clarification is really needed. We would be OK to go with the clarification is majority prefers to have it.  |
| Nokia  | Yes | We disagree with Qualcomm. The text is for NR-U process selection other than for IIoT UL grant selection. That is exactly why we should clarify due to such misunderstanding, because apparently there is a huge discrepancy in understanding among companies about what this sentence really means. For Xiaomi’s comments, we would like to point out that this is independent to whether IIOT features are configured or not. Even when IIoT features are not configured, the sentence “the UE shall prioritize retransmissions before initial transmissions” should not be applicable to grant selection in any case. Prioritizing retransmission for grant selection is not what we have agreed in Rel-16. |
| vivo | No | For the HARQ process selection for NR-U CG, it was agreed that it is totally up to UE implementation. With the addition part proposed in the CR, it seems the HARQ selection is not fully up to UE implementation, which may revert the achieved agreement?In our understanding, the sentence that “*The UE shall prioritize retransmissions before initial transmissions*” generally means retransmission for the pending TB due to LBT failure on a given HARQ process should be prioritized if the same HARQ process is selected for another CG PUSCH occasion. For the HARQ process selection, the UE is free to select the same HARQ process with pending TB or a new HARQ process for another initial transmission (p.s. the smart UE implementation may choose the same process but it is not mandatory). In this sense, we don’t think any clarification is needed in Rel-16. |
| ZTE | Yes | The suggested changes look okay to us.  |
| Ericsson | Yes | We disagree with Qualcomm and vivo. At RAN2#107bis the NR-U agreement was:1. HARQ process id selection is based on UE implementation. Ongoing retransmissions on HARQ processes should be prioritized.

Then at RAN2#108 when multiple CG are active:**Agreements of CG:**1. The processes with TB pending for retransmission shall be prioritized over the processes for new transmissions as already agreed for single CG case.

The spec text from these agreements wrere thoroughly discussed in the running MAC CR review.Thus, the NR-U agreements were clearly for HARQ process id selection. Further, the selection is for which HP ID for a certain grant (not for selecting the grant), and a CG can have many HP IDs associated with it and each one of them may result in a retransmission or a new transmission depending on what occurred previously.We are fine with the CR. |
| CATT | No | We agree with Xiaomi that, in R16, per the last sentence of last meeting agreement (quoted by Xiaomi) we should no longer try to fix anything to get both *cg-RetransmissionTimer* and *lch-basedPrioritization* get to work together.Now for the case when *lch-basedPrioritization* is not configured, we are not sure if there is any ambiguity. It would maybe good that proponents clarify which usecase is ambiguous and needs to be solved when *lch-basedPrioritization* is not configured.  |
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**Summary 3**: TBD.

**Proposal 3**: TBD.

Secondary DRX

[R2-2105232](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_114-e%5CDocs%5CR2-2105232.zip) Clarification on secondary DRX group Samsung CR Rel-16 38.321 16.4.0 1104 - F TEI16

R2-2105232 proposed to remove “associated” drx-onDurationTimer and specify in MAC “secondary DRX group is not configured, when DCP monitoring is configured”. Note that the restriction has already captured in RRC:

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| ***drx-ConfigSecondaryGroup***Used to configure DRX related parameters for the second DRX group as specified in TS 38.321 [3]. The network does not configure secondary DRX group with DCP simultaneously nor secondary DRX group with a dormant BWP simultaneously. |

**Question 4**: Do companies agree with the issue and if yes, are the suggested changes fine or does the text need to be improved / corrected ?

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| Answers to Question 4 |
| Company | Yes/No | Technical Arguments |
| Qualcomm | No | We do not think #1 change is correct. Each DCP occasion has an associated on duration timer, which is the first instance of on duration timer after a DCP. That's why "associated" is used in the current text.We do not think #2 change is not necessary. This restriction is already captured in the field description of drx-ConfigSecondaryGroup in 331. |
| LG |  | 1st change (to remove 'associated') – not necessary because *drx-onDurationTimer* is associated with the DRX group.2nd change (to specify secondary DRX in presence of DCP monitoring) – no strong view, but no need to redundantly capture that across TSs. |
| Xiaomi | No | The configuration restriction captured in 38.331 seems sufficient. |
| Lenovo | No |  |
| Ericsson | No | We agree with the comments from QC. |
| Nokia | No | Agree with Qualcomm. |
| vivo | No | Agree with Qualcomm. |
| ZTE | No | Agree with Qualcomm |
| CATT | No | “associated” was there before the DRX groups were introduced and, to our understanding, refers to the *drx-onDurationTimer* time instance associated with the DCP instance. For the 2nd change, no strong view but we tend to agree with rapporteur that it is already captured in RRC. |
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**Summary 4**: TBD.

**Proposal 4**: TBD.

eLCID

[R2-2105749](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_114-e%5CDocs%5CR2-2105749.zip) Clarification on MAC PDU assembly with eLCID Huawei, HiSilicon discussion Rel-16 NR\_IAB-Core

[R2-2106031](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_114-e%5CDocs%5CR2-2106031.zip) Clarification to transmission of padding and padding BSR with eLCID in IAB Ericsson, Apple CR Rel-16 38.321 16.4.0 1116 - F NR\_IAB-Core

[R2-2106321](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_114-e%5CDocs%5CR2-2106321.zip) CR for not transmitting only padding and padding BSR with eLCID Samsung, Nokia, Nokia Shanghai Bell, Qualcomm, LG, ZTE, MediaTek, Intel CR Rel-16 38.321 16.4.0 1118 - F NR\_IAB-Core

It has been agreed in the previous meeting to clarify this in MAC. Different styles are proposed in the above 3 contribution/CRs.

**Question 5**: Which of the changes proposed in the above TDocs do companies support?

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| Answers to Question 5 |
| Company | R2-2105749/R2-2106031/R2-2106321 | Technical Arguments |
| Qualcomm | R2-2106321 | We are fine with the TP in R2-2105749 too. |
| LG | 6321 | We think it is possible that MAC includes zero RLC SDU segment but only the RLC header. Therefore, 5749 is not the way to go.As a proponent of 6321, the change in 6321 is simple and sufficient. |
| Xiaomi | R2-2106321 |  |
| Lenovo | R2-2106321 |  |
| Ericsson | [R2-2106031](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_114-e%5CDocs%5CR2-2106031.zip)  | Regarding R2-2106321, we have concerns on the terminology used. In particular, the term “is used” is not clear whether it refers to the IAB node being configured with eLCID or using it for this transmission. In our understanding the “is used” should refer to the LCID associated to “data available and allowed” that are going to be transmitted. However, that is not clear from R2-2106321. In any case if R2-2106321 is agreed, we believe that the inter-operability analysis should be changed since it seems that also UEs are involved, which is not correct. Additionally, we do not foresee any inter-operability issues, since in any case the NW will always decode the MAC PDU, and if data are detected, those will not be discarded.For this reason, we believe that R2-2106031 is technically more correct, because it solves the issue related to the “is used” above. It also increases readability, since it clearly separates the scenarios of 8 and 10 bytes, and clarifies that the 10 bytes scenario is only applicable to the case two-octet LCID. Regarding R2-2105749, we agree with the intention to find a general statement that applies to all cases, however that modifies a legacy text (since the 8 bytes handling is removed), which is better to avoid at this stage.  |
| Nokia | R2-2106321 | It is also the outcome of the lengthy offline from previous meeting email discussion. |
| vivo | R2-2106321 | It should have been considered as IPA CR since the last meeting. |
| CATT | R2-2106321 | R2-2106321 is clear. |
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**Summary 5**: TBD.

**Proposal 5**: TBD.

2-Step RACH

[R2-2105851](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_114-e%5CDocs%5CR2-2105851.zip) Correction to 38.321 on msga-TransMax selection for 2-step RACH ZTE, Sanechips CR Rel-16 38.321 16.4.0 1112 - F NR\_2step\_RACH-Core

R2-2105851 proposed to change the rach-ConfigDedicated to cfra-TwoStep-r16 for the application of the msgA-TransMax in subclause 5.1.1a to correct the behaviour for HO:

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| 1> if *RA\_TYPE* is set to *2-stepRA*:2> set *PREAMBLE\_POWER\_RAMPING\_STEP* to *msgA-PreamblePowerRampingStep*;2> set *SCALING\_FACTOR\_BI* to 1;2> apply *preambleTransMax* included in the *RACH-ConfigGenericTwoStepRA*;2> if the Random Access procedure was initiated for handover; and2> if *cfra-TwoStep* is configured for the selected carrier:3> if *msgA-TransMax* is configured in the *cfra-TwoStep;*4> apply *msgA-TransMax* configured in the *cfra-TwoStep*.2> else if *msgA-TransMax* is included in the *RACH-ConfigCommonTwoStepRA*:3> apply *msgA-TransMax* included in the *RACH-ConfigCommonTwoStepRA*. |

**Question 6**: Do companies agree with the issue and if yes, are the suggested changes fine or does the text need to be improved / corrected ?

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| Answers to Question 6 |
| Company | Yes/No | Technical Arguments |
| Qualcomm | Yes | We think the reasons for change are correct, and we are fine with the TP. |
| LG | No | In our understanding, the original intention is not to allow switching from 2-step RA to 4-step RA if msaA-TransMax is not present in rach-ConfigDedicated. Please see the parameter description copied from 38.331:**msgA-TransMax**Max number of MsgA preamble transmissions performed before switching to 4-step type random access (see TS 38.321 [3], clauses 5.1.1). This field is only applicable when 2-step and 4-step RA type are configured and switching to 4-step type RA is supported. If the field is absent in RACH-ConfigDedidated, switching from 2-step RA type to 4-step RA type is not allowed. |
| Xiaomi | Yes | It seems that the two bullets 2> and 3> can be combined as one, which may make the specification more readable.2> if *msgA-TransMax* is configured in the *cfra-TwoStep* for the selected carrier:3> apply *msgA-TransMax* configured in the *cfra-TwoStep*.We think that the 38.331 sentence quoted by LG should be removed as it does not cover the case when “*msgA-TransMax* is only included in the *RACH-ConfigCommonTwoStepRA*”. |
| Nokia | Yes | Agree with the proposed text in R2-2105851. The proposal from Xiaomi would not work since it is possible that *msgA-TransMax* is not configured in *cfra-TwoStep*, but *cfra-TwoStep* is configured, then the UE still should not apply the *msgA-TransMax* in *RACH-ConfigCommonTwoStepRA*. |
| vivo | Comments | We share a similar view with LG. It looks like the current spec perfectly matches the following achieved agreement highlighted. **RAN2#109bis-e agreement:*** msgA-TransMax is configured for 2 step CFRA in rachConfigDedicated and that the UE is not allowed to switch to 4-step RACH if this is not configured in rachConfigDedicated.

If we misunderstood this agreement, we are fine with the CR. Meanwhile, a corresponding 38.331 CR is also needed for correction. For example (i.e. revision is red), **msgA-TransMax**Max number of MsgA preamble transmissions performed before switching to 4-step type random access (see TS 38.321 [3], clauses 5.1.1). This field is only applicable when 2-step and 4-step RA type are configured and switching to 4-step type RA is supported. If the field is absent in *cfra-TwoStep*, if present*~~RACH-ConfigDedidated~~*, switching from 2-step RA type to 4-step RA type is not allowed. |
| ZTE (Proponents) | Yes(Proponents) | In the current RRC spec, the msgA-TransMax is included in two places, one is in cfra-TwoStep of rach-ConfigDedicated and cfra-TwoStep represents the existing of 2-step CFRA resources, the other one is in RACH-ConfigCommonTwoStepRA. By following the current spec as shown below:2> if the Random Access procedure was initiated for handover; and2> if *rach-ConfigDedicated* is configured for the selected carrier:3> if *msgA-TransMax* is configured in the *rach-ConfigDedicated*:4> apply *msgA-TransMax* configured in the *rach-ConfigDedicated*.2> else if *msgA-TransMax* is included in the *RACH-ConfigCommonTwoStepRA*:3> apply *msgA-TransMax* included in the *RACH-ConfigCommonTwoStepRA*.If UE receive the HO command, only include the RACH-ConfigDedicated which only includes prioritization parameter (i.e ra-PrioritizationTwoStep-r16,ra-Prioritization), in this case, the msgA-TransMax is certainly absent in rach-ConfigDedicated and cfra resources in not provided (i.e only CBRA is available for this HO).If following the current spec for this case, even though the msgA-TransMAX is included in RACH-ConfigCommonTwoStepRA, UE cannot apply the msgA-TransMax included in RACH-ConfigCommonTwoStepRA, which is not the original intention for msgA-TransMax configured in RACH-ConfigCommonTwoStepRA. Regarding the comments from LG, if companies first agree with the intention of this change, then the field description of msgA-Transmax included in RACH-ConfigDedicated can also be corrected as below (instead of removing it since this IE is optional with need-s):**msgA-TransMax**Max number of MsgA preamble transmissions performed before switching to 4-step type random access (see TS 38.321 [3], clauses 5.1.1). This field is only applicable when 2-step and 4-step RA type are configured and switching to 4-step type RA is supported. If the field is absent in cfra-TwoStep, switching from 2-step RA type to 4-step RA type is not allowed. |
| CATT | Yes | We agree with the changes. |
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**Summary 6**: TBD.

**Proposal 6**: TBD.

# 4 Conclusion

TBD.