**3GPP TSG-RAN WG2 Meeting #131** **R2-250xxxx  
Bengaluru, India, August 25-29, 2025**

**Agenda item: 8.5.1**

**Source: InterDigital (Rapporteur)**

**Title: [POST131][111][NES] 38.321 CR (InterDigital)**

**Document for: Discussion and Decision**

# Introduction

This document collects the comments received during the following email discussion on the MAC CR for the R19 NES work item:

**[POST131][111][NES] (InterDigital)**

**Scope:** Update NES 38.321 CR (including this meeting agreements also).

**Intended outcome:** 38.321 CR in R2-2506222 to be agreed.

**Deadline:** Short email discussion

## Contact information:

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| Company | Delegate Name | Email |
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# Discussion on TS 38.321 running CR

The following CR was endorsed in RAN2#131 as a baseline:

R2-2505792 Introduction of network energy saving enhancements to TS 38.321 InterDigital CR Rel-19 38.321 18.6.0 2110 - B Netw\_Energy\_NR\_enh-Core

**Endorsed and considered as baseline for further discussion.**

In the CR draft uploaded to this email discussion, the endorsed CR is updated to capture these agreements:

* SIB 1 request is supported for both SUL and NUL.
* Option 1b (a same featureCombinationPreamblesList-r17 applies to both legacy and additional RACH, and R2 keep the conclusion, allow mixing of CE feature and non-CE feature in the same RACH-ConfigCommon, and clarify in the MAC spec that if CE is applicable for random access procedure and RACH-ConfigCommon associated with selected random access resource set includes additional RO, UE does not use additional RO configured in this RACH-ConfigCommon.) is agreed.
* TP in R2-2505789 is baseline for MAC update.

For ease of tracking, the following two changes are added to the endorsed version to capture these agreements:

In section 5.1.1b:

1> if the Random Access procedure was initiated by SI request, SIB1 request, reconfiguration with sync, beam failure recovery, LTM Cell Switch, a PDCCH order for an LTM candidate cell, or a PDCCH order with the *PRACH association indicator field* in DCI set to 1; or

1> if Msg1 repetition is applicable for the current Random Access procedure:

2> PRACH occasions configured by *addlRACH-Config-Adaptation* in *RACH-ConfigCommon* of a set of Random Access resources are not applicable for this Random Access procedure.

1> else:

2> PRACH occasions configured by *addlRACH-Config-Adaptation* in *RACH-ConfigCommon* of a set of Random Access resources are applicable for this Random Access procedure, if available (as specified in TS 38.213 [6] and 38.212 [9]).

In section 5.15.1:

1> if *initialDownlinkBWP-RedCap* is configured:

2> if the Random Access procedure was initiated for SI request or SIB1 request (as specified in TS 38.331 [5]) and the Random Access Resources for SI request have been explicitly provided by RRC, and if the selected carrier is SUL carrier:

3> monitor the PDCCH on the BWP configured by *initialDownlinkBWP*.

2> else:

3> monitor the PDCCH on the BWP configured by *initialDownlinkBWP-RedCap*.

Companies can provide comments and suggestions to the uploaded draft CR in this table. Please do not add changes, suggestions, or comments directly to the draft CR document.

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| --- | --- | --- |
| Company + Issue Number (e.g., ID001) | Issue | Comments and proposed changes |
| Sharp 001 | For the addition in section 5.15.1, the RedCap UE behaviour is for RRC\_IDLE/INACTIVE mode and *initialDownlinkBWP-RedCap* is included in SIB1, then when the UE requests OD-SIB1, the *initialDownlinkBWP-RedCap* has not been derived or was invalid. | The addition in section 5.15.1 could be removed.  [Rapp]: Please refer to the comment under Eri005 |
| Sharp 002 | Description on how to handle On-demand SSB Activation/Deactivation MAC CE when MAC entity receives it is missing.  RRC layer applies corresponding RRM measurement procedures based on OD-SSB status, and physical layer needs to know OD-SSB status to decide how to receive SSB, so the MAC entity should indicate to RRC layer and physical layer when the MAC CE is received. | Add a subsection to describe how to handle On-demand SSB Activation/Deactivation MAC CE.  5.18.x On-demand SSB Activation/Deactivation  The network may activate and deactivate the configured on-demand SSB by sending the On-demand SSB Activation/Deactivation MAC CE described in clause 6.1.3.x.  The MAC entity shall:  1> if the MAC entity receives an On-demand SSB Activation/Deactivation MAC CE:  2> indicate to upper layers the information regarding the On-demand SSB Activation/Deactivation MAC CE;  2> indicate to lower layers the information regarding the On-demand SSB Activation/Deactivation MAC CE.  [Rapp]: added in v2. |
| ERI 001 | The cover page should include the CR numbers for the mega capability CRs, i.e., 38.306 and 38.331 | [Rapp]: added in v3. |
| ERI 002 |  |  |
| ERI 003 | The name of the parameter *ra-SIB1PreambleStartIndex* should be replaced with *sib1-RA-PreambleStartIndex* to align with the 38.331 CR. | [Rapp]: name replaced in v3. |
| ERI 004 | The name of the parameter *rsrp-SIB1ThresholdSSB* should be replaced with *sib1-rsrp-ThresholdSSB* to align with the 38.331 CR.  Should *rsrp-ThresholdSSB-SUL* also be captured in this section? | [Rapp]: name replaced in v3. |
| ERI 005 | Regarding Sharp’s first comment above: isn’t it possible that a RedCap UE might have acquired OD-SIB1 at some point earlier in time and this is now about a new request? Then shouldn’t we capture the highlighted part as proposed by the rapporteur?  One should also consider the following update in that case:  if the Random Access procedure was initiated for SI request or SIB1 request (as specified in TS 38.331 [5]) and the Random Access Resources for SI request or SIB1 request have been explicitly provided by RRC, and if the selected carrier is SUL carrier: | [Rapp]: I have re-added it, for that possibility that UE already has a previous SIB1. In any case it does do no harm, as the else branch afterwards (when the UE does not have *initialDownlinkBWP-RedCap* configured) results in selecting |
| ERI 006 | The name of the parameter *addlRACH-Config-Adaptation* should be replaced with *addlRACH-Config-Adapt* to align with the 38.331 CR. | [Rapp]: name replaced in v3. |
| ERI 007 | Same as above for: *ra-AssociationPeriodIndexSib1* => *sib1-RA-AssociationPeriodIndex* | [Rapp]: name replaced in v3. |
| ERI 008 | Same as above for: *ra-ssb-OccasionMaskIndexSib1* => *sib1-RA-SSB-OccasionMaskIndex* | [Rapp]: name replaced in v3. |
| ERI 009 | Please check for similar others above. |  |
| ERI 010 | The highlighted part should not be italic:  1> if the Random Access procedure was initiated by SI request, SIB1 request, reconfiguration with sync, beam failure recovery, LTM Cell Switch, a PDCCH order for an LTM candidate cell, or a PDCCH order with the *PRACH association indicator field* in DCI set to 1; or | [Rapp]: fixed in v3. Thank you! |

# Open Issue List

MAC Issue 1: RA-RNTI for PRACH adaptation (described in LS R1-2506587)

Additional open issues.

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| --- | --- |
| OPPO | For the issue touched by Sharp001 and ERI005:  1> if *initialDownlinkBWP-RedCap* is configured:  2> if the Random Access procedure was initiated for SI request or SIB1 request (as specified in TS 38.331 [5]) and the Random Access Resources for SI request have been explicitly provided by RRC, and if the selected carrier is SUL carrier:  3> monitor the PDCCH on the BWP configured by *initialDownlinkBWP*.  2> else:  3> monitor the PDCCH on the BWP configured by *initialDownlinkBWP-RedCap*.  1> else:  2> monitor the PDCCH on the BWP configured by *initialDownlinkBWP*.  There seem some unclear point to support OD-SIB1 request / response via Redcap-specific BWP:  1) Currently there is no Redcap-specific OD-SIB1 request configuration specified in SIBx, is this paragragh to hint there might be OD-SIB1 response may rely on PDCCH configured in Redcap-specific initial DL BWP?  2) If so, i.e., when *initialDownlinkBWP-RedCap* is configured (after SIB1 acquisition), UE is supposed to rely on PDCCH configured on *initialDownlinkBWP-RedCap*. Then from network perspective, upon reception of a SIB1 request, it has no idea whether it is from a UE has acquired SIB1, or a UE has not. And then it is hard to decide which PDCCH to use for response, the one for *initialDownlinkBWP* or the one for *initialDownlinkBWP-RedCap*.  [Rapp]: added MAC issue 2. |
| Offino | DRX section 5.7 of TS 38.321 defines the RNTIs for UE’s PDCCH monitoring. In our understanding, the new RNTI for SSB burst periodicity adaptation (i.e., *adap-ssbPeriodicityIndication-RNTI*) should also be added here (as otherwise the UE would be expected to monitor *adap-ssbPeriodicityIndication-RNTI* also during OFF duration/inactive time of the DRX cycle which would increase the UE’s power consumption).  [Rapp]: I have summarized this as MAC issue 3. For this one, I will propose capturing this part of the miscellaneous corrections rapporteur CR as follows:  5.7 Discontinuous Reception (DRX)  The MAC entity may be configured by RRC with a DRX functionality that controls the UE's PDCCH monitoring activity for the MAC entity's C-RNTI, CI-RNTI, CS-RNTI, INT-RNTI, SFI-RNTI, SP-CSI-RNTI, TPC-PUCCH-RNTI, TPC-PUSCH-RNTI, TPC-SRS-RNTI, AI-RNTI, SL-RNTI, SL-CS-RNTI, SL-PRS-RNTI, SL-PRS-CS-RNTI, SL Semi-Persistent Scheduling V-RNTI, cellDTRX-RNTI, and *adap-SSBPeriodicityIndication-RNTI*. When using DRX operation, the MAC entity shall also monitor PDCCH according to requirements found in other clauses of this specification. When in RRC\_CONNECTED, if DRX is configured, for all the activated Serving Cells, the MAC entity may monitor the PDCCH discontinuously using the DRX operation specified in this clause; otherwise the MAC entity shall monitor the PDCCH as specified in TS 38.213 [6].  Along with adding the RNTI to the table in section 7.1. This follows the same conclusion as the cell-DTX-RNTI monitoring with C-DRX in R18. Note that R1 also agreed that:   |  | | --- | | **Agreement**  For adaptation of SSB in time-domain, for DCI 2\_9-based SSB burst periodicity adaptation for an SCell,   * The DCI is scrambled a new RNTI,   + Same search space and DCI size as that of cell DTX/DRX DCI if gNB configures both |   Since the same search space is used for monitoring both the DCI with cell DTX/DRX RNTI (cellDTRX-RNTI) and the DCI with adap-SSBPeriodicityIndication-RNTI, the same monitoring behavior as that of cell DTX/DRX DCI makes sense during C-DRX. |
| LGE | In the last meeting, it is agree to changed MAC specification in order to allow the configuration of Msg1 repetition partition and non-Msg1 repetition partition in the same RACH-ConfigCommon, considering that additional RO is not configured with Msg1 repetition.  1> if the Random Access procedure was initiated by SI request, SIB1 request, reconfiguration with sync, beam failure recovery, LTM Cell Switch, a PDCCH order for an LTM candidate cell, or a PDCCH order with the *PRACH association indicator* field in DCI set to 1; or  1> if Msg1 repetition is applicable for the current Random Access procedure:  2> PRACH occasions configured by *addlRACH-Config-Adapt* in *RACH-ConfigCommon* of a set of Random Access resources are not applicable for this Random Access procedure.  1> else:  2> PRACH occasions configured by *addlRACH-Config-Adapt* in *RACH-ConfigCommon* of a set of Random Access resources are applicable for this Random Access procedure, if available (as specified in TS 38.213 [6] and 38.212 [9]).  However, current text causes unnecessary restriction to use the additional RO. In detail, even though the Msg1 repetition is applicable based on the channel quality, if the set of Random Access resources associated with Msg1 repetition **is not selected** (due to feature combination and feature priority), the Msg1 repetition is actually performed and there is no need to restrict the usage of additional RO.  Therefore, whether the additional RO is applicable should be determined by **selected feature combination**, not by applicable feature combination.  So it is suggested to move this text to the end of clause 5.1.1b and change as follows:   |  | | --- | | 1> if the Random Access procedure was initiated by SI request, SIB1 request, reconfiguration with sync, beam failure recovery, LTM Cell Switch, a PDCCH order for an LTM candidate cell, or a PDCCH order with the *PRACH association indicator* field in DCI set to 1; or  1> if the set of Random Access resources associated with Msg1 repetition is selected for the current Random Access procedure:  2> PRACH occasions configured by *addlRACH-Config-Adapt* in *RACH-ConfigCommon* of a set of Random Access resources are not applicable for this Random Access procedure.  1> else:  2> PRACH occasions configured by *addlRACH-Config-Adapt* in *RACH-ConfigCommon* of a set of Random Access resources are applicable for this Random Access procedure, if available (as specified in TS 38.213 [6] and 38.212 [9]). |   [Rapp]: this text is in section “5.1.1b”, which takes place before selection of a set of random access resource, so I don’t think we can refer to “selected sets” as this point. However, that said, I think the existing text already there captures your intention as it says “PRACH occasions configured by addlRACH-Config-Adapt in RACH-ConfigCommon of a set of Random Access resources are not applicable”  And therefore RACH occasions configured with addlRACH-Config-Adapt in RACH-ConfigCommon a set of random access resources are not valid; other occasions in other random access sets are valid.  [LGE2] Let me elaborate more on our comment.  In clause 5.1.1b of Rel-18 MAC specification, “applicable” does not necessarily mean that the feature is “used.”  Specifically, assume that RACH partition is configured as follows:   * RACH partition 1: no feature * RACH partition 2: RedCap + Msg1 repetition (RepNum = 2) * RACH partition 3: RedCap + Msg1 repetition (RepNum = 4)   Then, for non-RedCap UE, Msg1 repetition may be applicable based on the channel quality, RACH partition associated with Msg1 repetition (RACH partition 2 or RACH partition 3) will NOT be selected since there is RACH partition 2/3 is not available due to RedCap indication.  However, for this case, even though the non-Redcap UE does not actually performs the Msg1 repetition, the non-RedCap UE in bad channel condition **cannot** use the additional RO based on the current text.  Based on the corresponding text is located in before the selection of the set of Random Access resources, two changes are proposed:   * + - 1. Move the text to the end of the 5.1.1b (after the selection of set of Random Access resources)       2. Modify the corresponding text as follows:  |  | | --- | | 1> if the Random Access procedure was initiated by SI request, SIB1 request, reconfiguration with sync, beam failure recovery, LTM Cell Switch, a PDCCH order for an LTM candidate cell, or a PDCCH order with the *PRACH association indicator* field in DCI set to 1; or  1> if the set of Random Access resources associated with Msg1 repetition is selected for the current Random Access procedure:  2> PRACH occasions configured by *addlRACH-Config-Adapt* in *RACH-ConfigCommon* of a set of Random Access resources are not applicable for this Random Access procedure.  1> else:  2> PRACH occasions configured by *addlRACH-Config-Adapt* in *RACH-ConfigCommon* of a set of Random Access resources are applicable for this Random Access procedure, if available (as specified in TS 38.213 [6] and 38.212 [9]). |   [Rapp]: in fact, this text was first added at the end of 5.1.1b, but Ericsson pointed out correctly that it should take place before the UE selects a RA resource set; here is the related comment for last email discussion (R2-2505791):  “ER01: In our view the addition at the bottom of section 5.1.1b in v2, below, is not needed. The selection is already completed at this point, so this should either be captured separately for each case, e.g., LTM Cell Switch, SI request etc., before resource selection or above all (if possible at all using the current framework). Further, a better place for this is just before “*NOTE 1: Void.*”. After the notes, all procedural text is about selection of RA resources.”  Therefore, my suggestion is to keep the text where it is and modify it as follows:  1> if the Random Access procedure was initiated by SI request, SIB1 request, reconfiguration with sync, beam failure recovery, LTM Cell Switch, a PDCCH order for an LTM candidate cell, or a PDCCH order with the *PRACH association indicator* field in DCI set to 1:  2> PRACH occasions configured by *addlRACH-Config-Adapt* in *RACH-ConfigCommon* of a set of Random Access resources are not applicable for this Random Access procedure.  1> else if Msg1 repetition is applicable for the current Random Access procedure:  2> PRACH occasions configured by *addlRACH-Config-Adapt* in *RACH-ConfigCommon* of a set of Random Access resources associated with Msg1 repetition and another feature indication (as specified in clause 5.1.1c) are not applicable for this Random Access procedure.  1> else:  2> PRACH occasions configured by *addlRACH-Config-Adapt* in *RACH-ConfigCommon* of a set of Random Access resources are applicable for this Random Access procedure, if available (as specified in TS 38.213 [6] and 38.212 [9]).  Let me know if this is okay and captures the intention. |
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# Conclusion

The running CR is updated considering the comments above. The approved version is in R2-2506571

In addition, the rapporteur has identified the following two open issues for MAC that can be addressed in company contributions:

**MAC Issue 1**: RA-RNTI for PRACH adaptation (described in LS R1-2506587)

**MAC issue 2:** whether "initialDownlinkBWP-RedCap" can be configured before SIB1 request procedure (e.g. acquired by UE earlier) and can be used for PDCCH monitoring. If so, can the network know that for a redcap UE performing an OD-SIB1 request.

Further, the rapporteur proposed capturing a resolution for the following open issue part of the miscellaneous corrections rapporteur CR. Companies need not address this in their contribution.

**MAC Issue 3**: Monitoring adap-SSBPeriodicityIndication-RNTI during C-DRX