3GPP TSG-RAN WG2 Meeting #113 Electronic R2-21xxxxx

Online, 25 January – 05 February 2021

**Agenda item: 5.4.1.1**

**Source: Apple Inc**

**Title: DRAFT- Summary of [AT113-e][005][NR15] Connection Control II (Apple)**

**WID/SID: NR\_newRAT-Core**

**Document for: Discussion and Decision**

# 1 Introduction

This document is the report of the following email discussion:

* [AT113-e][005][NR15] Connection Control II (Apple)

Scope: Treat [R2-2100057](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2100057.zip), [R2-2101462](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101462.zip), [R2-2101459](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101459.zip), [R2-2101166](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101166.zip), [R2-2100945](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2100945.zip), [R2-2101019](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101019.zip), [R2-2101267](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101267.zip), [R2-2101268](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101268.zip), [R2-2100841](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2100841.zip), [R2-2100756](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2100756.zip), [R2-2100757](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2100757.zip)

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

Intended outcome: Report and Agreed CRs.

Deadline: Schedule A

Deadline for providing comments and for rapporteur inputs:

* + - Initial deadline (for companies' feedback): 1st week Thu Jan 28, UTC 1200
    - Deadline for CR finalization: 2nd week Thu, UTC 1200

# 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 |
| Apple (Rapporteur) | Naveen Palle | naveen\_palle@apple.com |
| Huawei, HiSilicon | Zhenzhen Cao | caozhenzhen@huawei.com |
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# 3 BWP Switching related issues

For this discussion, we are going to use the below papers submitted for this meeting in order to address the RAN4 LS R2-2100057:

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| [R2-2100057](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2100057.zip) LS on RRC based BWP switch for Scell (R4-2017040; contact: Apple) RAN4 LS in Rel-15 NR\_newRAT-Core To:RAN2  Moved from 5.1  [R2-2101462](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101462.zip) Discussion on RRC-based BWP switch Apple Inc discussion Rel-15 NR\_newRAT-Core  [R2-2101459](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101459.zip) [Draft] LS Reply on RRC based BWP switch Apple Inc LS out Rel-15 NR\_newRAT-Core To:RAN4  [R2-2101166](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101166.zip) Discussion on RRC based BWP switch for Pcell ZTE Corporation, Sanechips discussion  [R2-2100945](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2100945.zip) Clarification on RRC based BWP switch for SCell Nokia, Nokia Shanghai Bell discussion Rel-15 NR\_newRAT-Core, LTE\_NR\_DC\_CA\_enh-Core  [R2-2101019](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101019.zip) RRC-based BWP switch for SpCell and SCells vivo discussion NR\_newRAT-Core |

3.1 Usage of *firstActiveDownlinkBWP-Id* and *firstActiveUplinkBWP-Id* for SpCell and SCell

The following is stated in the RAN4 LS where RAN2 is requested to confirm:

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| *According to RAN4 understanding the firstActiveDownlinkBWP-Id or firstActiveUplinkBWP-Id defined in TS 38.331 can be changed only for SpCell and for SCell upon activation.* |

The text is a bit ambiguous for SCell in terms of how to interpret “upon activation” when viewed from a RRC reconfiguration message. It makes sense from Rel-16 perspective where the SCell can be activated with an RRC message. Based on the papers: [R2-2101166](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101166.zip), [R2-2101019](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101019.zip), [R2-2101462](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101462.zip) and [R2-2100945](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2100945.zip) we can propose at least the below.

**Question 1**: *firstActiveDownlinkBWP-Id* and *firstActiveUplinkBWP-Id* can be changed for an SpCell in a reconfiguration message. And this results in a BWP switch. Do companies agree with this?

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| Answers to Question 1 | | |
| Company | Yes/No | Comments |
| Apple | Yes | This is the method of BWP switch for SpCell using RRC signalling. |
| Huawei, HiSilicon | Yes | To be precise, if the RRC configured *firstActiveDownlinkBWP-Id* and *firstActiveUplinkBWP-Id* are different from current active BWPs (dynamically switched by DCI), it would result in a BWP switch. |
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There are differing views for SCell. We can start the discussion with the below:

**Question 2**: In Rel-15 *firstActiveDownlinkBWP-Id* and *firstActiveUplinkBWP-Id* can only be given/changed for an SCell in a reconfiguration message at the time of SCell addition. Do companies agree with this?

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| Answers to Question 2 | | |
| Company | Yes/No | Comments |
| Apple | Yes |  |
| Huawei, HiSilicon | Yes | Note that according to R2-2100552, the condition to indicate these fields for SCell will be changed to “The field is mandatory present for an SCell upon addition, and absent for SCell in other cases, Need M.” |
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According to [R2-2100945](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2100945.zip) the *firstActiveDownlinkBWP-Id* and *firstActiveUplinkBWP-Id* can be changed while the SCell is deactivated. But according to [R2-2101166](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101166.zip), [R2-2101019](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101019.zip), [R2-2101462](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101462.zip) this is not the case.

**Question 3**: In Rel-16 can ***firstActiveDownlinkBWP-Id* and *firstActiveUplinkBWP-Id*** be changed for an SCell in a reconfiguration message when the SCell is deactivated?

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| Answers to Question 3 | | |
| Company | Yes/No | Comments |
| Apple | No | Per the need code of ***firstActiveDownlinkBWP-Id* and *firstActiveUplinkBWP-Id*** for SCell, this can only be given to the UE at the time of SCell addition. It can be given at the time of SCell modification. So it cannot be changed even in Rel-16 unless the SCell is being added. The UE does not consider this as a BWP switch if the SCell is released and added again (the UE considers this as a new SCell). |
| Huawei, HiSilicon | No | The condition to include the fields of firstActiveDownlinkBWP-Id and firstActiveUplinkBWP-Id is still “The field is mandatory present for an SCell upon addition, and absent for SCell in other cases, Need M.” |
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**Summary 1**: TBD.

**Proposal 1**: TBD.

3.2 BWP switch at RRCSetup/RRCResume

[R2-2101166](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101166.zip) makes the below observation. Do companies have objection to this?

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| **Observation: Since the UE uses the initial BWP for sending MSG3 and receiving MSG4, reception of RRCSetup/RRCResume triggers a BWP switch procedure in case firstActiveDownlinkBWP-Id and/or firstActiveUplinkBWP-Id in the RRCSetup/RRCResume message indicates a dedicated BWP other than initial BWP.** |

**Question 4**: Do companies also view the above observation as valid?

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| Answers to Question 4 | | |
| Company | Yes/No | Comments |
| Apple | Yes (with a note) | This is applicable only to SpCell where the NW can modify the BWP config at the time of RRCResume and can also modify the firstActive for UL/DL and this is a BWP switch.  For SCells, there wont be a BWP switch. The UE starts with the firstActive BWP if the RRCResume indicates to activate the SCell in the RRC message. |
| Huawei, HiSilicon | Yes | The observation should be only for PCell upon initial access. |
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**Question 5**: According to [R2-2101166](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101166.zip) *RRCResume/RRCSetup* might not be part of description in TS38.133 which uses *RRCReconfiguration* and so proposes to add this clarification by sending an LS. If Q1 is agreeable, do companies see the need to include this in the RAN2 reply LS?

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| Answers to Question 5 | | |
| Company | Yes/No | Comments |
| Apple | Yes | We are ok to clarify. |
| Huawei, HiSilicon | Yes | Ok to clarify it. |
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**Summary 2**: TBD.

**Proposal 2**: TBD.

3.3 Parameter change of an active BWP in SpCell and SCell

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| For the RAN4 question#1:  *Whether RRC reconfiguration can change any parameter of the already active BWP of an activated SCell or SpCell.* |

For the above, [R2-2101462](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101462.zip) discusses about what parameters can be changed for an active BWP for SpCell and SCell. [R2-2101462](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101462.zip) also brings up the point whether the common config of a UE dedicated BWP can be changed.

**Question 6**: Do companies agree that any parameter of **IE *BWP-DownlinkDedicated* and *BWP-UplinkDedicated*** in the UE dedicated BWPs (including *initialDownlinkBWP* and *initialUplinkBWP*) can be changed in a RRC reconfiguration message without resulting in a BWP switch?

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| Answers to Question 6 | | |
| Company | Yes/No | Comments |
| Apple | Yes | No BWP switch occurs in this case. |
| Huawei, HiSilicon | Yes |  |
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**Question 7**: Do companies agree that any parameter of **IE *BWP-DownlinkCommon* or *BWP-UplinkCommon*** in the UE dedicated BWPs be changed in a RRC reconfiguration message for the same BWP?

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| Answers to Question 7 | | |
| Company | Yes/No | Comments |
| Apple | No | While the ASN.1 construct allows this, we wonder how the UE should view/behave if the critical operating BWP parameters of common config (like the BW, PRB, SCS) changes for the same BWP! We think this should be atleast considered a BWP switch. But atleast for Rel-15/Rel-16, it’s safer for the NW to release and add the BWP again if the core common parameters are to be changed. As mentioned in our paper, TS38.331 mentions that common config of UE dedicaged BWPs are to be treated as cell-specific parmeters, and if they are to be changed, they would have to be changed for all the UEs using the “similar” BWP config. We think its rare for the NW to change the operating BWP config, and in such rare cases it’s better to release and add the changed BWP than changing the common config dynamically. For SCell, we anyway follow such logic. |
| Huawei, HiSilicon | Yes | We should inform RAN4 that current RRC allows reconfiguration of any parameters of a BWP, including common and dedicated parameters of the active BWP.  Whether to treat common configuration of a BWP differently, e.g. define different requirements, would be up to RAN4 discussion. |
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**Question 8**: If the answer to Q7 is yes, can the UE still view this as the same BWP or view it as a BWP switch?

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| Answers to Question 8 | | |
| Company | BWP switch? | Comments/views |
| Apple | Yes | As answered in Q7, we prefer to not have such scenario, but if this is indeed preferred in RAN2, we would like to view this as a BWP swtich. |
| Huawei, HiSilicon | No | How to treat this kind of reconfiguration would be up to RAN4, e.g. they may define different requirements.  From RAN2’s point of view, we should not treat this kind of reconfiguration as BWP switch. |
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**Question 9**: If the answer to Q7 is no, any views on how the NW can change the common config? And if a spec change is needed.

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| Answers to Question 9 | | |
| Company | Comments/views |
| Apple | Our view is to release the BWP and add the BWP again. The UE would view this as a new BWP.  We are ok to capture this in chair’s notes and no spec change is needed. |
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**Summary 3**: TBD.

**Proposal 3**: TBD.

[R2-2101462](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101462.zip) also discusses about releasing an active BWP via RRC message.

**Question 10**: Do companies agree that if the NW releases an active BWP for an SpCell, the NW should provide the ***firstActiveDownlinkBWP-Id* and *firstActiveUplinkBWP-Id*** for the SpCell to prevent the ambiguity for the UE to know which BWP to use?

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| Answers to Question 10 | | |
| Company | Yes/No | Comments |
| Apple | Yes | The firstActiveBWP (UL or DL) is optional for the NW to provide, and it is need ‘N’ (not ‘M), If the active BWP is released, the UE cannot be relied to remember the earlier provided first active BWP to switch to. Rather, the NW should provide the firstActiveBWP for the UE to use, in the same RRC message that releases the active BWP.  Infact, this would be means of BWP switching for 6-1 UEs (which can only be configured with one BWP). |
| Huawei, HiSilicon | No | It should be clarified first what is the case of “the NW releases an active BWP for an SpCell”.  If there are multiple BWPs configured, the network may switch the BWP dynamically using DCI. From RRC point of view, the network doesn’t need to know exactly which BWP is the active one and is scheduled by DCI, when it sends the RRC reconfiguration to release a BWP.  But of course during the reconfiguration ambiguous period (i.e. before receiving the reconfiguration complete message), the network should be careful and should not use the BWP to be released. This is only the network implementation, and no restriction is needed to mandate the network to do RRC-based BWP switch, i.e. to provide the firstActiveDownlinkBWP-Id and firstActiveUplinkBWP-Id. |
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**Question 11**: If the answer to Q10 is no, companies are requested to provide their view on which BWP should the UE use in this case?

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| Answers to Question 11 | | |
| Company | Comments |
| Huawei, HiSilicon | The UE can just follow the network scheduling and use the BWP indicated by DCI. |
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**Question 12**: If the answer to Q10 is yes, companies are requested to provide their view on if a spec change is needed?

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| Answers to Question 12 | | |
| Company | Comments ( for eg., on whether a spec change is needed or if it is already specified or if it can be captured in chair notes) |
| Apple | We are ok to capture this in chair’s notes if companies prefer no change in spec. |
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**Question 13**: Can the NW release the active BWP of an SCell using an RRC message?

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| Answers to Question 13 | | |
| Company | Yes/No | Comments |
| Apple | No | Inline with our views earlier, if the active BWP is released, the UE should be given a firstActiveBWP to fallback to. But for SCell, the firstActiveBWP (DL/UL) can only be given at the time of SCell addition. So the NW would have to release and add the SCell in such a case |
| Huawei, HiSilicon | Yes/No | As clarified above, the BWP can be switched by DCI dynamically. From RRC point of view, any configured BWP can be released or reconfigured. But of course, the network scheduling should be careful and should not use the released BWP during the reconfiguration ambiguous period, and this can be handled by implementation. |
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**Question 14**: If the answer to Q13 is no, companies are requested to provide their view on if a spec change is needed?

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| Answers to Question 14 | | |
| Company | Comments ( for eg., on whether a spec change is needed or if it is already specified or if it can be captured in chair notes) |
| Apple | Capturing in Chair’s notes is ok for us if majority prefers. |
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**Summary 4**: TBD.

**Proposal 4**: TBD.

3.4 BWP switch from parameter change of an active BWP in SpCell and SCell

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| For the RAN4 question#2:  *Whether this RRC reconfiguration without modification of firstActiveDownlinkBWP-Id or firstActiveUplinkBWP-Id for an activated SCell or SpCell can trigger a BWP switch.* |

**From the perspective of the rapporteur, the answer to this would be dependent on the inputs from the companies to Q1, Q2, Q3 and from Q13/14.**

The rapporteur intends to provide a summary based on this, but do request companies to provide their answer to the below question.

**Question 15**: Does the RRC reconfiguration without modification of firstActiveDownlinkBWP-Id or firstActiveUplinkBWP-Id for an activated SCell trigger a BWP switch?

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| Answers to Question 15 | | |
| Company | Yes/No | Comments |
| Apple | No | As provided earlier, we think that for an SCell a BWP swtich using RRC is through releasing and adding the SCell with a new BWP using firstActiveBWP DL/UL. |
| Huawei, HiSilicon | No | BWP can be switched by RRC by including firstActiveDownlinkBWP-Id or firstActiveUplinkBWP-Id, or by DCI. |
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**Summary 5**: TBD.

**Proposal 5**: TBD.

# 4 Skip ACK upon *reconfigurationWithSync*

There are two sets of CRs related to this topic marked for this discussion, as shown below, however, the second one is a shadow CR.

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| [R2-2101267](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101267.zip) Clarification of Note for leaving source cell at reconfigurationWithSync Ericsson CR Rel-15 38.331 15.12.0 2394 - F NR\_newRAT-Core  [R2-2101268](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101268.zip) Clarification of Note for leaving source cell at reconfigurationWithSync Ericsson CR Rel-16 38.331 16.3.1 2395 - A NR\_newRAT-Core |

**Question 4.1**: Is the intent of the CRs in [R2-2101267](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101267.zip) and [R2-2101268](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101267.zip) agreeable?

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| Answers to Question 4.1 | | |
| Company | Yes/No | Comments (e.g. changes required to be acceptable, why the CR is or is not needed) |
| Apple | No, but no strong view | We think the current text is clear enough as this refers to the HARQ/ARQ for the RRC message that triggers the “handover”. The UE anyway does not associate/link the received RLC to which RRC message. |
| Huawei, HiSilicon | No | The current Note is clear for RRC messages. The handling of DRB depends on e.g. the indication of reestablishRLC, and no need to revise this Note. |
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**Summary 6**: TBD.

**Proposal 6**: TBD.

# 5 Local Release

There are one CR which proposes a change to 38.331 on adding more clarification on UE local release.

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| [R2-2100841](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2100841.zip) Further Clarification on RRC Local Release vivo discussion |

**Question 5.1**: Is the intent of the proposal in [R2-2100841](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2100841.zip) agreeable?

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| Answers to Question 5.1 | | |
| Company | Yes/No | Comments |
| Apple | Yes | We are ok to the proposed changes in the disc paper. |
| Huawei, HiSilicon | Yes | Ok with the clarification |
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**Summary 7**: TBD.

**Proposal 7**: TBD.

# 6 RLC Mode in Split bearer

There are two sets of CRs related to this topic marked for this discussion, as shown below, however, the second one is a shadow CR.

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| [R2-2100756](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2100756.zip) RLC Mode Restrictions Nokia, Ericsson (Rapporteur), Nokia Shanghai Bell CR Rel-15 38.331 15.12.0 2351 - F NR\_newRAT-Core  [R2-2100757](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2100757.zip) RLC Mode Restrictions Nokia, Ericsson (Rapporteur), Nokia Shanghai Bell CR Rel-16 38.331 16.3.1 2352 - A NR\_newRAT-Core |

**Question 6.1**: Is the intent of the CRs in [R2-2100756](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2100756.zip) and [R2-2100757](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2100756.zip) agreeable?

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| Answers to Question 6.1 | | |
| Company | Yes/No | Comments (e.g. changes required to be acceptable, why the CR is or is not needed) |
| Apple | No | the proposed change in RRC spec “The RLC modes of all the RLC entities associated with the same PDCP entity shall be identical i.e. either UM or AM (see TS 38.323 [5]).” does not match the MAC text for the case “PDCP duplication used for split RB”....so the change are not entirely correct. Also, we do not think this change is necessary because MAC spec is clear |
| Huawei, HiSilicon | No | Not essential. No change is also good to us, given that PDCP spec already clarified the same thing. |
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**Summary 8**: TBD.

**Proposal 8**: TBD.

# 7 Conclusion

To be filled.