3GPP TSG-RAN WG2 Meeting #110-e [R2-2005747](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005747.zip)

Elbonia, 1 – 12 June 2020

**Agenda item: 4.5**

**Source: Nokia (RAN2 Vice-chair )**

**Title: Summary of offline email discussion [203] on LTE contributions in AI 4.5**

**Document for: Discussion and Decision**

# 1 Brief scope of the LTE legacy contributions

This document contains the summary of documents from agenda item 4.5 (“Other LTE corrections Rel-15 and earlier”) as referenced in Section 4.

# 2 LTE legacy summary

## 2.1 Pre-Rel-15 topics

The documents in [1-14] and [17-28] all concern pre-Rel-15 topics as shown below.

|  |  |
| --- | --- |
| **Tdoc(s), Title, Company** | **Proposal(s)** |
| 1) [R2-2005351](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005351.zip), [R2-2005352](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005352.zip), [R2-2005353](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005353.zip), [R2-2005354](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005354.zip) and [R2-2005355](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005355.zip) [1-5], “Correction on t312 timer information”, ZTE Corporation, Sanechips | **Rel-12, New proposal (related to NR Rel-16 agreements for NR mobility WI)**  Clarify the descriptions for start, stop, expiry of T312 |
| 2) [R2-2005191](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005191.zip), [R2-2005192](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005192.zip), [R2-2005193](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005193.zip), [R2-2005194](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005194.zip), “Clarification on codebook-HARQ-ACK-r13 capability for CA with more than 5CCs”, Nokia, Nokia Shanghai Bell, Qualcomm Incorporated [6-9] | **Rel-13, Discussed already in RAN2#109-e and RAN2#109bis-e**  Clarify it is mandatory for UEs to support both CC and DAI for more than 5CCs.  **Rel-16 CR endorsed in RAN2#109bis-e** |
| 3) [R2-2005551](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005551.zip), [R2-2005552](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005552.zip), [R2-2005553](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005553.zip) and [R2-2005554](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005554.zip), “Correction on PDU generation for UL spatial multiplexing”, ASUSTeK [10-13] | **Rel-14, New proposal**  Clarify UE behaviour with UL skipping and UL spatial multiplexing: Are there cases when UE has an issue when using UL spatial multiplexing because the UL skipping causes MAC not to generate a second TB? |
| 4a) [R2-2005186](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005186.zip), [R2-2005187](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005187.zip), [R2-2005188](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005188.zip), [R2-2005189](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005189.zip), [R2-2005190](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005190.zip), “Clarification to UE capabilities for non-contiguous intra-band CA”, Nokia, Nokia Shanghai Bell, Qualcomm Incorporated, [18-22]  AND  4b) [R2-2005481](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005481.zip), [R2-2005482](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005482.zip), [R2-2005483](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005483.zip), [R2-2005484](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005484.zip), [R2-2005485](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005485.zip), [R2-2005486](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005486.zip), [R2-2005487](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005487.zip), “Clarification on UE capability for intra-band non-continuous CA”, Huawei, Hisilicon, [23-28] | **Rel-10/12, Discussed already in RAN2#109-e and RAN2#109bis-e**  CRs from Rel-10/12 to clarify intra-band non-contiguous is handled as intra-band contiguous as proposed by discussion document.  **Handled in email discussion [AT110-e][202]** |
| 5a) [R2-2005083](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005083.zip), [R2-2005084](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005084.zip), “Correction to the LTE Rel-15 TDD/FDD capability differentiation”, Huawei, HiSilicon [29-30]  AND  5b) [R2-2005743](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005743.zip) [AT110-e#201][LTE] LTE Rel-15 TDD/FDD capability differentiation [Pre-meeting] Huawei, HiSilicon [31] | **(At least) Rel-15, New proposal**  Discussion on how to handle missing TDD/FDD differentiation on LTE capabilities.  **Handled in email discussion [AT110-e][201]** |

The topic 2) was already discussed in RAN2#109-e, with the following conclusion:

|  |
| --- |
| [R2-2003859](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2003859.zip) Clarification on codebook-HARQ-ACK-r13 capability for CA with more than 5CCs Nokia, Nokia Shanghai Bell, Qualcomm Incorporated CR Rel-16 36.306 16.0.0 1750 1 A LTE\_CA\_enh\_b5C-Core   * Handled in offline email discussion [202] * Intent is agreeable and is endorsed as resolving the topic. * Postponed |

Hence, it is proposed that for the topic 2), the CRs [6-9] are agreed to close this issue.

The topics 1) and 3) are new, and following can be noted:

* The topic 1) is triggered by change in NR T312, and the document proposes to align LTE T312 with NR T312. However, given that the LTE functionality was introduced already in Rel-12, it should be checked that the proposed change is backward-compatible (since the proposal does seem to change the existing text, which is not a problem in NR since the T312 was never introduced before).
* The topic 3) notes that when UL skipping (introduced in Rel-14) is configured and UE is using UL spatial multiplexing, it could occur that UE only generates a TB for one of the spatial streams due to lack of data and the configured UL skipping feature. This may lead to issues with PHY as it expects to receive a TB for both of the UL spatial streams. It seems that this is an inadvertent change brought by RAN2 MAC procedural text, so should be discussed if/how this should be corrected.

Finally, for the topic 4), an additional email discussion **[AT110-e][202]** is used to further discuss how to resolve the issue so it is not handled via this document, and the topic 5) is likewise handled in an additional email discussion **[AT110-e][201]**.

**DISC S1\_1:** Discuss whether the T312 changes as per [R2-2005351](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005351.zip), [R2-2005352](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005352.zip), [R2-2005353](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005353.zip), [R2-2005354](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005354.zip) and [R2-2005355](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005355.zip) are agreeable and whether the change is backward-compatible.

**DISC S1\_2:** Discuss the MAC specification issue as per [R2-2005551](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005551.zip) and whether the CRs in [R2-2005552](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005552.zip), [R2-2005553](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005553.zip) and [R2-2005554](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005554.zip) resolve it.

**Proposal S1\_1:** Agree to CRs in [R2-2005191](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005191.zip), [R2-2005192](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005192.zip), [R2-2005193](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005193.zip) and [R2-2005194](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005194.zip).

## 2.2 Miscellaneous Rel-15 corrections

The CRs in [1-2], [12-12] and [24-28] all concern Rel-15 as shown below:

|  |  |
| --- | --- |
| **Tdoc, Title, Company** | **Proposal(s)** |
| 6) [R2-2005678](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005678.zip), “Correction of AUL HARQ process”, ASUSTeK [14] | **New proposal** (Rel-16 shadow missing)  Clarification that maximum HARQ process ID = maximum number of HARQ processes **– 1** |
| 7) [R2-2004407](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2004407.zip), [R2-2004408](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2004408.zip), “Correction on SRB duplication”, OPPO, LG Electronics [15-16] | **Discussed already in RAN2#109bis-e**  Postponed in last RAN2 meeting to consider rapporteur views, with intent agreed. |
| 8) [R2-2005283](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005283.zip), “Minor changes collected by Rapporteur”, Samsung Telecommunications [17] | **Rapporteur input on ASN.1 minor issues**  Already discussed last time, postponed to account for comments. |

Out of these documents, 6) is a new proposal but seems very simple so the discussion should mainly be about whether the proposed correction is suitable. The remaining CRs in 7) and 8) were already discussed and seem relatively straightforward to agree so the summary rapporteur proposes to treat them as a batch of agreeable CRs.

**Proposal S2\_1:** Agree to PDCP CRs (co-signed by PDCP rapporteur) in [R2-2004407](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2004407.zip) and [R2-2004408](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2004408.zip).

**Proposal S2\_2:** Agree to RRC rappporteur CR in [R2-2005283](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005283.zip). If agreeable, provide also Rel-16 shadow in [R2-2005746](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005746.zip).

**DISC S2\_1:** Discuss whether the intent of the CR [R2-2005678](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005678.zip) is agreeable. If agreeable, also provide a Rel-16 shadow CR.

**Discussion on Proposal S2\_1 and Proposal S2\_2:**

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| --- | --- |
| **Company** | **Comments on the proposals** |
| Lenovo | To S2\_1: We disagree with the CRs. The changes proposed go beyond what was discussed in RAN2#109bis-e (R2-2002619/2620). We wonder why it is not appropriate to merely fix the CR implementation mistake (add missing “for SRBs” in the header 5.1.2.1.4). Furthermore, we think that removing of “and SRBs” in 5.1.2.1.4.1 is not correct due to the fact that the description related to integrity verification is only applicable for SRBs. |
| Lenovo | To S2\_2: Most of the changes look ok, however, there are still some issues to fix (cover page etc.). Furthermore, during offline discussion prior this meeting further issues were identified which can be fixed. |
| OPPO | Response to Question from Lenovo on S2\_1: the delta part comes from the suggestion from PDCP rapporteur (LG), the main reason is that “However, adding SRB directly into the title of 5.1.2.1.4 is not appropriate, since 5.1.2.1 is for DRB while 5.1.2.2 is for SRB, so it is preferred to describ the behavior of SRB in 5.1.2.2.”, as we clarified in the cover page. This is merely a structure issue, and the view from rapporteur has to be respected, according to the agreement from RAN2#109bis-E.  Furthermore, we want to hightlight that we have not received any technical argument since last meeting, and the conclusion was that to leave this rapporteur-CR, which is the reason for this update. |
| Samsung(Rapporteur) | To S2\_2: I have uploaded to the inbox a slight revision of the CR in R2-2005995 in which I included some further changes based on offline comments (see cover page). |
| Qualcomm | Prop S2\_1: ok with the CRs.  Prop S2\_2: Thanks for updated version R2-2005995. Agree with included changes, but we think one more change from R2-2005018 discussed in offline [403] should also be merged here. So further update may be required based on other ASN.1 conclusions during this meeting (which may need porting back to rel15). |
| Ericsson | Support Prop S2\_2.  S2\_1: We think these CRs are new and havn’t been discussed before. According to our understanding it is not allowed (according to 3GPP rules) to change titles, only to make the Void. This could be double checked with the secretary. In such case the CRs need to be rewritten. |

**Conclusions (DISC\_S2\_1 and DISC S2\_2): Some companies have concerns on the CR [R2-2004407](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2004407.zip) and [R2-2004408](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2004408.zip). The CR [R2-2005283](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005283.zip) has been updated in R2-2005995 and could be agreeble.**

* Proposal S2\_1: Discuss online how to handle the proposal.
* Proposal S2\_2: Agree to content R2-2005995 and discuss if other changes need to be still merged to the rappporteur CR.

# 3 Company comments to the contributions

## 3.1 [R2-2005351](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005351.zip), [R2-2005352](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005352.zip), [R2-2005353](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005353.zip), [R2-2005354](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005354.zip) and [R2-2005355](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005355.zip): Correction on t312 timer information (ZTE Corporation, Sanechips)

This section deals with DISC\_S1\_1:

***DISC S1\_1:*** *Discuss whether the intent for the T312 changes as per* [*R2-2005351*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005351.zip)*,* [*R2-2005352*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005352.zip)*,* [*R2-2005353*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005353.zip)*,* [*R2-2005354*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005354.zip) *and* [*R2-2005355*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005355.zip) *is agreeable and whether the change is backward-compatible.*

Two aspects should be discussed: First, whether the intent of the correction is acceptable and second, whether the proposed correct captured the intent and is backward-compatible. Companies are requested to provide comments in the tables 1 and 2 below (one row for each new comment to better keep track of the discussion – please don’t edit the previous comments.

|  |  |
| --- | --- |
| **Company** | **Is the intent of the proposed correction to T312 correct?** |
| Lenovo | Partly. Furthermore, on the agreeable changes we propose to add them from Rel-15 in the rapporteur CR. |
| OPPO | No. We do not think this is BC change. |
| HW | We think the changes should be added from Rel-16, similar as in NR. |
| ZTE | Yes, we think it’s better to keep the consistency of T312 descriptions in LTE and NR specs. |
| Ericsson | The reason for change (to align with NR) is not a strong argument. We do not agree with the CR. |

**Table 1. Intent of the CR**

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| --- | --- |
| **Company** | **Comments on the detailed CRs in** [**R2-2005351**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005351.zip)**,** [**R2-2005352**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005352.zip)**,** [**R2-2005353**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005353.zip)**,** [**R2-2005354**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005354.zip) **and** [**R2-2005355**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005355.zip) **(including backward-compatibility aspects)** |
| Lenovo | Some changes are ok but we think there is no need to backport them to Rel-12. In detail:   * In “start” adding “and useT312 has been set to true” is principally ok, however the description of the timers in 7.3.1 is informative and not critical, so we are ok to add it from Rel-15. Reason: Rel-15 CR4198r1 (R2-2001725) with magic sentence was agreed in RAN2#109-e where changes to T312 were made (align procedure text and ASN.1 due to BOOLEAN type of useT312). * In “stop” adding “upon the reconfiguration of rlf-TimersAndConstant” is not ok. Referring to current spec this condition does not result in stopping T312 and introducing it would require a modification of the T312 functionality. * In “expiry” removing “If security is not activated: go to RRC\_IDLE” is ok. When T312 was initially introduced in V12.0.0 the requirement for starting the timer after successful AS security activation was not there yet. This was changed in a later version of Rel-12 36.331. However, it was missed to update the description in 7.3.1. Same as for the change of “start” description, the description of the timers in 7.3.1 is informative and not critical, so we are ok to make the removal from Rel-15. |
| Qualcomm | The coverpage says, “At RAN2#109bis-e meeting, the following change for T312 timer information was agreed for NR in TS 38.331:” but it is unclear which document introduced these changes.  We agree with Lenovo’s comments above about the changes.  About the release, there is no need to port NR-like functionality to LTE Rel-12. We are fine to have changes (after addressing Lenovo’s suggestions) from the same release as that was introced in NR (which I assume is Rel-16 unless I missed something). |
| HW | We support to have these changes from Rel-16 in order to avoid any non-backward compatible change and this change can be included in the rapporteur CR. |
| ZTE | This change was introduced in ASN.1 review on NR mobility enhancement, and agreed in R2-2003850.  We agree with Lenovo’s comments above about the changes. If the majority thinks there is no need to fallback those changes to Rel-12, we are also fine to make them from Rel-16. |
| Ericsson | All the proposed changes are made to the informative annex making none of them normative. |

**Table 2. Details and backward-compatibility of the CRs**

**Conclusions (DISC\_S1\_1): There is some suppport but also questions on backward-compatibility of the CR. Some companies also propose to only include this from Rell-16 onwards.**

* DISC S1\_1: Include the changes in Rel-16 rapporteur CR. Discuss online how to handle inter-operability (i.e. Rel-16 UE operating under Rel-12 network).

## 3.2 [R2-2005551](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005551.zip), [R2-2005552](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005552.zip), [R2-2005553](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005553.zip) and [R2-2005554](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005554.zip): Correction on PDU generation for UL spatial multiplexing (ASUSTeK)

This section deals with DISC\_S2\_1:

***DISC S1\_2:*** *Discuss the MAC specification issue as per* [*R2-2005551*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005551.zip) *and whether the CRs in* [*R2-2005552*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005552.zip)*,* [*R2-2005553*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005553.zip) *and* [*R2-2005554*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005554.zip) *resolve it.*

Two aspects should be discussed: First, whether the intent of the correction is acceptable and second, if the the intent is correct, whether the proposed CR correctly captures it or if some changes are needed (including ensuring backward-compatibility since the feature was introduced already in Rel-14).

Companies are requested to provide comments in the table 3 and 4 below (one row for each new comment to better keep track of the discussion – please don’t edit the previous comments.

|  |  |
| --- | --- |
| **Company** | **Is the intent as explained in** [**R2-2005551**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005551.zip) **correct?** |
| OPPO | Yes, and we believe it is sufficient to rely on NW implementation to solve this, i.e., option-1 in 551, so no need for the CRs. |
| Qualcomm | **We agree with the problem. And we agree with intent of option 2. See CR comments below.** |
| HW | **We tend to agree with the intention.** |
| Ericsson | We think this can be handled with network implementation as described in the paper. |

**Table 3. Intent of the CR**

|  |  |
| --- | --- |
| **Company** | **Comments on the detailed CRs in** [**R2-2005552**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005552.zip)**,** [**R2-2005553**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005553.zip) **and** [**R2-2005554**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005554.zip) **(including backward-compatibility aspects)** |
| Qualcomm | Intent is correct but the text is wrong (it is not clear what “MAC PDUs comprises MAC SDU(s) means).  It should be something to the effect of “For the case of uplink spatial multiplexing, if at least one MAC PDU is generated based on the above conditions, MAC entity shall generate both MAC PDUs.”  NOTE numbering missing. |
| HW | Actually we think this can be leave to either UE implementation or NW implementation and there is no need to add this note in the spec. |
| ASUSTeK | In general, we are fine with the update from Qualcomm, though “based on the above conditions” may be deleted. |
| Ericsson | It is not clear how the UE behaviour in the specification result in the note. Remember that notes only clarify specification text, they do not describe new UE behaviour. |
|  |  |

**Table 4. Details and backward-compatibility of the CRs**

**Conclusions (DISC S1\_2):** **Some companies think the intent is correct but others consider this can be left up to UE and/or network implementation, as NOTE will not specify anything.**

* DISC S1\_2: The intent seems agreeable but companies think the CR is either not needed or not correct. Discuss online whether something is needed.

## 3.3 R2-2005678: Correction of AUL HARQ process (ASUSTeK)

This section deals with DISC\_S2\_1:

***DISC S2\_1:*** *Discuss whether the intent of the CR* [*R2-2005678*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005678.zip) *is agreeable. If agreeable, also provide a Rel-16 shadow CR.*

Companies are requested to provide comments in the table 5 below (one row for each new comment to better keep track of the discussion – please don’t edit the previous comments.

|  |  |
| --- | --- |
| **Company** | **Comments on the CR** [**R2-2005678**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005678.zip)**?** |
| Lenovo | We agree with the proposed change. |
| Qualcomm | Disc S2\_1: ok with intent of R2-2005678. |
| HW | We agree with the content. This change can be included in the Rapporteur CR. |
| ASUSTeK | We will upload a slight revision of the CR (with typo in cover page corrected) and the Rel-16 shadow CR. |
| Ericsson | Agree with the CR. |

**Table 5. Details of the CR**

**Conclusions (DISC S2\_1): The CR intent seems agreeable but since the change is small, it could be incorporated in the RRC rapporteur CR.**

* DISC S2\_1: Include the changes of [R2-2005678](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005678.zip) in Rel-15 RRC rapporteur CR R2-2005995.

# 4 Conclusions

**Agreements proposed to be agreed in this meeting (from all sub-topics)**

**Proposal S1\_1:** Agree to CRs in [R2-2005191](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005191.zip), [R2-2005192](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005192.zip), [R2-2005193](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005193.zip) and [R2-2005194](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005194.zip).

**Proposal S2\_1:** Agree to PDCP CRs (co-signed by PDCP rapporteur) in [R2-2004407](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2004407.zip) and [R2-2004408](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2004408.zip).

* Proposal S2\_1: Discuss online how to handle the proposal.

**Proposal S2\_2:** Agree to RRC rappporteur CR in [R2-2005283](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005283.zip).

* Proposal S2\_2: Agree to content R2-2005995 and discuss if other changes need to be still merged to the rappporteur CR.

**Open items proposed to be further discussed in this meeting (from all sub-topics)**

**DISC S1\_1:** Discuss whether the intent for the T312 changes as per [R2-2005351](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005351.zip), [R2-2005352](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005352.zip), [R2-2005353](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005353.zip), [R2-2005354](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005354.zip) and [R2-2005355](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005355.zip) is agreeable and whether the change is backward-compatible.

**Conclusions (DISC\_S1\_1): There is some suppport but also questions on backward-compatibility of the CR. Some companies also propose to only include this from Rell-16 onwards.**

* DISC S1\_1: Include the changes in Rel-16 rapporteur CR. Discuss online how to handle inter-operability (i.e. Rel-16 UE operating under Rel-12 network).

**DISC S1\_2:** Discuss the MAC specification issue as per [R2-2005551](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005551.zip) and whether the CRs in [R2-2005552](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005552.zip), [R2-2005553](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005553.zip) and [R2-2005554](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005554.zip) resolve it.

**Conclusions (DISC S1\_2): Some companies think the intent is correct but others consider this can be left up to UE and/or network implementation, as NOTE will not specify anything.**

* DISC S1\_2: The intent seems agreeable but companies think the CR is either not needed or not correct. Discuss online whether something is needed.

**DISC S2\_1:** Discuss whether the intent of the CR [R2-2005678](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005678.zip) is agreeable. If agreeable, also provide a Rel-16 shadow CR.

**Conclusions (DISC S2\_1): The CR intent seems agreeable but since the change is small, it could be incorporated in the RRC rapporteur CR.**

* DISC S2\_1: Include the changes in RRC rapporteur CR.

# 5 List of referenced documents

[1] [R2-2005351](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005351.zip) Correction on t312 timer information ZTE Corporation, Sanechips CR Rel-12 36.331 12.18.0 4316 - F HetNet\_eMOB\_LTE-Core

[2] [R2-2005352](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005352.zip) Correction on t312 timer information ZTE Corporation, Sanechips CR Rel-13 36.331 13.15.0 4317 - A HetNet\_eMOB\_LTE-Core

[3] [R2-2005353](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005353.zip) Correction on t312 timer information ZTE Corporation, Sanechips CR Rel-14 36.331 14.14.0 4318 - A HetNet\_eMOB\_LTE-Core

[4] [R2-2005354](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005354.zip) Correction on t312 timer information ZTE Corporation, Sanechips CR Rel-15 36.331 15.9.0 4319 - A HetNet\_eMOB\_LTE-Core

[5] [R2-2005355](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005355.zip) Correction on t312 timer information ZTE Corporation, Sanechips CR Rel-16 36.331 16.0.0 4320 - A HetNet\_eMOB\_LTE-Core

[6] [R2-2005191](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005191.zip) Clarification on codebook-HARQ-ACK-r13 capability for CA with more than 5CCs Nokia, Nokia Shanghai Bell, Qualcomm Incorporated CR Rel-13 36.306 13.12.0 1747 1 F LTE\_CA\_enh\_b5C-Core [R2-2003152](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2003152.zip)

[7] [R2-2005192](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005192.zip) Clarification on codebook-HARQ-ACK-r13 capability for CA with more than 5CCs Nokia, Nokia Shanghai Bell, Qualcomm Incorporated CR Rel-14 36.306 14.11.0 1748 1 A LTE\_CA\_enh\_b5C-Core [R2-2003153](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2003153.zip)

[8] [R2-2005193](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005193.zip) Clarification on codebook-HARQ-ACK-r13 capability for CA with more than 5CCs Nokia, Nokia Shanghai Bell, Qualcomm Incorporated CR Rel-15 36.306 15.8.0 1749 1 A LTE\_CA\_enh\_b5C-Core [R2-2003154](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2003154.zip)

[9] [R2-2005194](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005194.zip) Clarification on codebook-HARQ-ACK-r13 capability for CA with more than 5CCs Nokia, Nokia Shanghai Bell, Qualcomm Incorporated CR Rel-16 36.306 16.0.0 1750 2 A LTE\_CA\_enh\_b5C-Core [R2-2003859](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2003859.zip)

[10] [R2-2005551](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005551.zip) PDU generation for UL spatial multiplexing ASUSTeK discussion Rel-15 LTE\_LATRED\_L2-Core, TEI14

[11] [R2-2005552](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005552.zip) Correction on PDU generation for UL spatial multiplexing ASUSTeK CR Rel-14 36.321 14.12.0 1480 - F LTE\_LATRED\_L2-Core, TEI14

[12] [R2-2005553](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005553.zip) Correction on PDU generation for UL spatial multiplexing ASUSTeK CR Rel-15 36.321 15.8.0 1481 - A LTE\_LATRED\_L2-Core, TEI14

[13] [R2-2005554](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005554.zip) Correction on PDU generation for UL spatial multiplexing ASUSTeK CR Rel-16 36.321 16.0.0 1482 - A LTE\_LATRED\_L2-Core, TEI14

[14] [R2-2005678](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005678.zip) Correction of AUL HARQ process ASUSTeK CR Rel-15 36.331 15.9.0 4340 - F LTE\_unlic-Core

[15] [R2-2004407](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2004407.zip) Correction on SRB duplication OPPO, LG Electronics CR Rel-15 36.323 15.5.0 0280 1 F LTE\_HRLLC [R2-2002619](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2002619.zip)

[16] [R2-2004408](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2004408.zip) Correction on SRB duplication OPPO, LG Electronics CR Rel-16 36.323 16.0.0 0281 1 A LTE\_HRLLC [R2-2002620](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2002620.zip)

[17] [R2-2005283](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005283.zip) Minor changes collected by Rapporteur Samsung Telecommunications CR Rel-15 36.331 15.9.0 4314 - F MBMS\_LTE\_enh2-Core, TEI15 [R2-2003233](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2003233.zip) Late

[18] [R2-2005186](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005186.zip) Clarification to UE capabilities for non-contiguous intra-band CA Nokia, Nokia Shanghai Bell, Qualcomm Incorporated CR Rel-12 36.331 12.18.0 4247 1 F LTE\_CA-Core, TEI12 [R2-2003147](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2003147.zip)

[19] [R2-2005187](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005187.zip) Clarification to UE capabilities for non-contiguous intra-band CA Nokia, Nokia Shanghai Bell, Qualcomm Incorporated CR Rel-13 36.331 13.15.0 4248 1 A LTE\_CA-Core, TEI12 [R2-2003148](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2003148.zip)

[20] [R2-2005188](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005188.zip) Clarification to UE capabilities for non-contiguous intra-band CA Nokia, Nokia Shanghai Bell, Qualcomm Incorporated CR Rel-14 36.331 14.14.0 4249 1 A LTE\_CA-Core, TEI12 [R2-2003149](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2003149.zip)

[21] [R2-2005189](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005189.zip) Clarification to UE capabilities for non-contiguous intra-band CA Nokia, Nokia Shanghai Bell, Qualcomm Incorporated CR Rel-15 36.331 15.9.0 4250 1 A LTE\_CA-Core, TEI12 [R2-2003150](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2003150.zip)

[22] [R2-2005190](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005190.zip) Clarification to UE capabilities for non-contiguous intra-band CA Nokia, Nokia Shanghai Bell, Qualcomm Incorporated CR Rel-16 36.331 16.0.0 4251 1 A LTE\_CA-Core, TEI12 [R2-2003151](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2003151.zip)

[23] [R2-2005481](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005481.zip) Clarification on UE capability for intra-band non-continuous CA Huawei, Hisilicon CR Rel-10 36.331 10.22.0 4327 - F LTE\_CA-Core

[24] [R2-2005482](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005482.zip) Clarification on UE capability for intra-band non-continuous CA Huawei, Hisilicon CR Rel-11 36.331 11.19.0 4328 - A LTE\_CA-Core

[25] [R2-2005483](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005483.zip) Clarification on UE capability for intra-band non-continuous CA Huawei, Hisilicon CR Rel-12 36.331 12.18.0 4329 - F LTE\_CA-Core

[26] [R2-2005484](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005484.zip) Clarification on UE capability for intra-band non-continuous CA Huawei, Hisilicon CR Rel-13 36.331 13.15.0 4330 - F LTE\_CA-Core

[27] [R2-2005485](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005485.zip) Clarification on UE capability for intra-band non-continuous CA Huawei, Hisilicon CR Rel-14 36.331 14.14.0 4331 - A LTE\_CA-Core

[28] [R2-2005486](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005486.zip) Clarification on UE capability for intra-band non-continuous CA Huawei, Hisilicon CR Rel-15 36.331 15.9.0 4332 - A LTE\_CA-Core

[29] [R2-2005487](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005487.zip) Clarification on UE capability for intra-band non-continuous CA Huawei, Hisilicon CR Rel-16 36.331 16.0.0 4333 - A LTE\_CA-Core

[29] [R2-2005083](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005083.zip) Correction to the LTE Rel-15 TDD/FDD capability differentiation Huawei, HiSilicon CR Rel-15 36.331 15.9.0 4304 - F TEI15

[30] [R2-2005084](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005084.zip) Correction to the LTE Rel-15 TDD/FDD capability differentiation Huawei, HiSilicon CR Rel-16 36.331 16.0.0 4305 - A TEI15

[31] [R2-2005743](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005743.zip) [AT110-e#201][LTE] LTE Rel-15 TDD/FDD capability differentiation [Pre-meeting] Huawei, HiSilicon discussion Rel-15 TEI15 Late