**3GPP TSG-RAN WG2 Meeting #113bis-e *R2-210xxxx***

**Online, 12–20 April 2021**

**Agenda item: 6**

**Source: Mediatek inc (RAN2 Chairman)**

**Title: Report of [AT113bis-e][001][TEI16] TEI16 new and small (Chairman)**

**Document for: Discussion and Agreement**

# 1 Introduction

THIS VERSION IS THE PHASE 2 VERSION

**In phase 2, we continue acc to proposed outcome of phase 1:**

This is the result of the following email discussion in RAN2#113bis-e Meeting:.

* [AT113bis-e][001][TEI16] TEI16 new and small (Chairman)

Scope: Treat R2-2103042, R2-2103043, R2-2103044, R2-2103045, R2-2102623, R2-2102624, R2-2103467, R2-2103464  
Phase 1, determine agreeable parts, Phase 2, for agreeable parts Work on CRs.  
Intended outcome: Report and Agreed-in-principle CRs, if any  
Deadline: Schedule A

**Chairman views:**

1/ Now is late for R16, so completely new functionality for TEI16 would require strong support and fixing a real and important problem.

2/ However, for some TEI16 proposals is it not clear-cut whether they are new functionality or bug fixes or consistency updates. For bug-fixes and small consistency updates the bar is lower. For the proposals in this discussion it is not clear cut whether they should be regarded as new functions or not, and they they fullfill the requirement that they are small, so thus RAN2 can discuss.

Please feel free to ask questions. The proponents need to reply to questions. If possible please provide a position statement, and some brief justification, to facilitate decision whether the proposals or some modified variant of them can be accepted/agreed or not, in phase 1. Detailed dicussions on Proposals that seems agreeable is expected in phase 2.

# 2 Contact Information

|  |  |
| --- | --- |
| Company | Contact: Name (E-mail) |
| Moderator RAN2 Chair | Johan Johansson (johan.johansson@mediatek.com) |
| ZTE | eswar.vutukuri@zte.com.cn |
| Nokia | Tero Henttonen (tero.henttonen@nokia.com) |
| Qualcomm | Mouaffac Ambriss ([mambriss@qti.qualcomm.com](mailto:mambriss@qti.qualcomm.com) ) |
| Docomo | Masato Taniguchi (masato.taniguchi.mf@nttdocomo.com) |
| Ericsson | Oscar Ohlsson (oscar.ohlsson@ericsson.com) |
| MediaTek | Felix Tsai (chun-fan.tsai@mediatek.com) |
| Lenovo | hchoi5@lenovo.com |
| Perspecta Labs | Achilles Kogiantis ([akogiantis@perspectalabs.com](mailto:akogiantis@perspectalabs.com)) |
| Intel | [Sudeep.k.palat@intel.com](mailto:Sudeep.k.palat@intel.com) |
| OPPO | duzhongda@opp.com |
| CATT | Jing Liang(liangjing@catt.cn) |
| Samsung | Jaehyuk Jang (jack.jang@samsung.com) |
| Huawei | Simone.provvedi@huawei.com |
| Apple | Yuqin Chen (yuqin\_chen@apple.com) |
| Ericsson | Martin.van.der.zee@ericsson.com |
| Rakuten Mobile | Awn.muhammad@rakuten.com |

# 3 Phase 2 Discussion

## 3.1 Phase 2: Redirection with MPS indication

[R2-2103042](file:///C:\evutukuri\work\5G\RAN2\docs\R2-2103042.zip) Redirection with MPS Indication Perspecta Labs, CISA ECD, T-Mobile, Ericsson, Qualcomm CR Rel-16 36.331 16.4.0 4579 2 C NR\_newRAT-Core, TEI16 R2-2102232

[R2-2103043](file:///C:\evutukuri\work\5G\RAN2\docs\R2-2103043.zip) Redirection with MPS Indication Perspecta Labs, CISA ECD, T-Mobile, Ericsson, Qualcomm CR Rel-16 38.331 16.4.1 2413 2 C NR\_newRAT-Core, TEI16 R2-2102233

[R2-2103044](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113bis-e\Docs\R2-2103044.zip) Redirection with MPS Indication Perspecta Labs, CISA ECD, T-Mobile, Ericsson, Qualcomm CR Rel-16 36.306 16.4.0 1804 1 C NR\_newRAT-Core, TEI16 R2-2102234

[R2-2103045](file:///C:\evutukuri\work\5G\RAN2\docs\R2-2103045.zip) Redirection with MPS Indication Perspecta Labs, CISA ECD, T-Mobile, Ericsson, Qualcomm CR Rel-16 38.306 16.4.0 0526 1 C NR\_newRAT-Core, TEI16 R2-2102235

Phase 1 - Proposal 1: For R2-2103042-45 aim to prepare technical endorsed CRs to RAN plenary (do the CRs now at this meeting), and decide at RP whether to do this at all, whether in R16/R17 and whether a WI is required, e.g. due to CT1 involvement or other aspects potentially requiring deepend discussion.

Phase 2 - Proponents are asked to provide Draft revisions of the CRs on the server, manage the updates, address and reply to comments.

Participants may provide detailed comments as bubble comments in the Draft CR files, higher level comments here.

**High level comments on the CRs, if any:**

|  |  |  |
| --- | --- | --- |
| Company | Position | Detailed Comments |
| Samsung | - | Nevertheless, if it is agreeable by RAN2, the text needs to be improved: e.g., from the condition 'if the UE has set the mpsPriorityIndicator', mpsPriorityIndicator in LTE CR should be changed to *highPriorityAccess* as in LTE *establishmentCause*, and mpsPriorityIndicator in NR CR should be changed to mps-PriorityAccess as in NR *establishmentCause*?  Just to clarify the comments from phase 1 above, it was unclear to me the meaning of the proposed new condition '2> else if the UE has set the *mpsPriorityIndicator*' in access barring check, as '*mpsPriorityIndicator*' does not exist anywhere. At the first glance, I thought that it may refer to the mapped establishment cause since the word 'UE has set' is used from the CR.  However, if the intention was to refer the '*mpsPriorityIndication*' that was introduced in *RRCRelease* in the CR, I guess the same condition in other subclauses can be used instead, like '2> if the establishment of the RRC connection is triggered by release with redirect with *mpsPriorityIndication*'. |
| Ericsson |  | Two high level comments/questions:   * It would be good to clarify exactly which scenario(s) the CR is addressing. According to reason for change, the NR CR targets case 3 (i.e. mobile terminated MPS session) while the LTE CR targets also case 2 (mobile originated MPS session for UE without MPS subscription). Is there a reason for this difference? * Both the LTE and NR CR contains statements like “if the establishment of the RRC connection is triggered by release with redirect with mpsPriorityIndication”. But in my understanding the RRC connection establishment is not triggered by the release with redirect itself but rather by the fact that the UE enters a new tracking area which causes NAS to trigger a tracking area update. Is this the correct understanding? |
| OPPO |  | Would like to get answer to questions raised in phase 1 discussion |
| Perspecta Labs |  | Provided revised draft CRs for TS 38.331 and TS 36.331 in the discussion folder that include the below comments:  On Samsung comments: Corrected normative text to use “mpsPriorityIndication” in both TS 38.331 and TS 36.331 CRs  On Ericsson comments:  -Corrected cover page to correctly state that the CRs address cases 2 and 3 (MT and MO of unsubscribed UE).  -Improved normative text to:  “1> if the establishment of the RRC connection resulted *~~is triggered by~~*in NR from *~~via~~* *RRCRelease* or in E-UTRA from *~~via~~* *RRCConnectionRelease”*  On OPPO comments:  -gNB/eNB is aware of an ongoing MPS session through the ARP/QCI and Priority level. MPS typically uses distinguishable values that are under operator control.  -The CRs address all redirection cases and we think a complete solution should also include LTE to NR.  -OPPO correctly points out that there is no “indicator is cleared” in the normative text. The cover page text was a stray description from an earlier version of the CR. The cover text is corrected.  Also:  -In the CR we corrected a separate typo on ASN.1 text: RRCConnectionRelease-v1640-IEs and RRCRelease-v1641-IEs were changed to -v16xy-IEs.  -Added NTT DoCoMo co-signing. |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

## 3.2 Phase 2: Initiation of RNA update

[R2-2103623](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113bis-e\Docs\R2-2103623.zip) Clarification on the initiation of RNA update Huawei, HiSilicon discussion Rel-16 TEI16

Phase 1 - Proposal 2: There is support for the changes in R2-2103623 (on a high level, details for further discussion).

Phase 2 - Proponent is asked to provide Draft revision of the CR on the server, manage the updates, address and reply to comments.

Participants may provide detailed comments as bubble comments in the Draft CR files, higher level comments here, if any.

**High level comments on the CRs, if any:**

|  |  |  |
| --- | --- | --- |
| Company | Position | Detailed Comments |
| OPPO |  | We are fine but not happy with early implementation i.e. Rel-16 CR is sufficient. |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

## 3.4 Phase 2: Combined RRC procedures

[R2-2103467](file:///C:\evutukuri\work\5G\RAN2\docs\R2-2103467.zip) On combined RRC procedures Nokia, Nokia Shanghai Bell, Ericsson discussion Rel-16 TEI16 R2-2101319

[R2-2103464](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113bis-e\Docs\R2-2103464.zip) RRC processing delays for combined procedures Nokia, Nokia Shanghai Bell, Ericsson CR Rel-16 38.331 16.4.1 1288 8 F TEI16 R2-2101320

Phase 1 - Proposal 4: Continue the discussion on R2-2103467 with the assumption that we’d agree later the release applicability for TS change, if any is agreeable.

a) Clarify whether multiple DL RRC messages in a TB is currently considered allowed (e.g. according to current UE implementations), in particular for the two cases on the table in R2-2103467. If not, whether it is worthwhile to enable this. Note that this seems to have been intended for R15. Discuss whether a TS change is desireable to clarify the current situation.

b) Check whether there is interest to allow relaxation of processing time, such that reply to first procedure can be sent after second procedure is finished.

Phase 2 – Continued Discussion – first steps

Note that There is need to attempt to agree any TS change at the Current meeting.

Question a) partial: Clarify whether multiple DL RRC messages (DCCH) in a TB is currently considered allowed (e.g. according to current UE implementations), in particular for the two cases on the table in R2-2103467. Is a TS change desireable to clarify the current situation? (E.g. to avoid that gNB send message combinations that UEs cannot handle?)

|  |  |  |
| --- | --- | --- |
| Company | Position | Detailed Comments |
| ZTE | Allowed | gNB is allowed to send multiple RRC messages in the same TB. We don’t think this needs any spec changes, but if companies have different understanding, we are okay to add somethink in the spec to clarify this. |
| Intel | Allowed | gNB is allowed to send multiple RRC messages in the same TB. We also don’t think any specs changes are need about this. It is well specified in RRC that UE processes the messages one message at a time in sequence in the order received as captured in section 5.1.2:  1> process the received messages in order of reception by RRC, i.e. the processing of a message shall be completed before starting the processing of a subsequent message;  NOTE: Network may initiate a subsequent procedure prior to receiving the UE's response of a previously initiated procedure.  1> within a clause execute the steps according to the order specified in the procedural description; |
| Samsung | Allowed | We also think that gNB is allowed to send multiple RRC messages in the same TB, and UE should be able to process the messages one at a time in sequence. If companies think that it is clear from the specification, we are fine to not capture anything further. |
| OPPO | Allowed | Agree with ZTE |
| Apple | Allowed | We agree with other companies on the following two points:   1. RRC is allowed to send mulitple RRC messages in the same TB 2. UE process the messages one at a time in sequence.   We are fine to make the clarification in the spec or in chairman notes. |
| Huawei, HiSilicon | Allowed | We don't think any clarification is needed |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

Question b) is there interest to allow relaxation of processing time for “combined” procedures, such that reply to the first procedure can be sent after the second procedure is finished? (Note that the phase1 seems to indicate answer “no” to this question, but the explanations given were in many cases not clear).

|  |  |  |
| --- | --- | --- |
| Company | Position | Detailed Comments |
| ZTE | Further discussion needed | For the relaxations being discussed in this question, there are two issues:   1. Combined processing time: As noted in phase 1, the understanding seems to be that this just the sum of the individual processing times. If we assume sequential processing (please see below) then it seems this is already clear for combined messages?      1. Exceptions to sequential processing: Firstly, from the responses in phase-1 it seems even the proponents of the CRs don’t seem to want any exceptions to sequential processing (or did we misunderstand this?) ?   Anyway, this needs explicit discussion and our understanding is that UEs will process the message sequentially (without delaying until the subsequent message) unless we explicitly change this. i.e. there should be no blanket requirement that the UE shall delay the processing of first message if two messages are included in the same TB (even if combined processing times are defined).  If we want to change this, this needs to be discussed on a case-by case basis and again we need a clear understanding of why we want to delay the processing of a given message. In this case, is the reason for delaying the processing of the reestablishment message lack of L1 resources in first message? If so, we don’t agree that this is a good solution and hence we don’t think we should allow delaying reestablishmentComplete message as a way forward. Instead if there is an acknowledgement of the problem then we should go via the LTE route (i.e., to include the L1 configuration in reestablishment message). |
| Intel | No | The current RRC procedure, as mentioned in our response to the previous question, requires UE to process completely an RRC message – which includes delivery of the response message to the lower layers before processing another message.  1> submit the *RRCReestablishmentComplete* message to lower layers for transmission;  1> the procedure ends.  And the lower layers will attempt to deliver the message as soon as possible, possibly using second RACH for SR.  So it doesn’t seem possible to delay the response to the first procedure until the second procedure is complete without making an exceptions in RRC or in lower layers – which would not be something to consider this late for Rel-16.  The issues mentioned in the document were brought up in late Rel-15 and again in Rel-16 TEI16 (with a different and simpler solution of including PHY configuration in *RRCReestablshment* message) and no resolution was considered needed.  Some background on combined LTE SMC+RRCReconfiguration: This requires special handling in the UE as the SMC contains the security configuration for the RRCReconfiguration message in the same TB as the SMC. So the UE has to completely process the SMC, configure the PDCP security configuration and only then process the RRCReconfiguration message in PDCP (so this goes beyond the RRC processing in sequence).  This special handling was identified right at the beginning of LTE Rel-8 and specification text captured the combined procedure without directly mentioning the inter-layer interactions in the UE. |
|  |  |  |
| OPPO |  | It is new UE behaviour to allow UE to hold reestablishmentComplete until the treatment of 1st reconfiguration after reestablishment i.e. current spec doesn’t allow this. And we intend to think there is no strong motivation to change the situation. |
| Apple |  | In our understanding, current UE’s behavior is shown in the following example.  1. Assumpton is that the procedure#1 has Xms delay requirement, and procedure#2 has Yms delay requirement.  2. For the combined RRC procedure (procedure#1+ procedure#2), when UE receives both RRC messages at T0,  2.1. First UE processes procedure#1, and the complete message of procedure#1 is ready for transmission at T1 (T0+X)  2.2. UE starts to process procedure#2 from timepoint Z+Xms, and the complete message is ready for transmission at T2 (T0+X+Y).    Based on our understanding on current UE behavior as above, we have no strong view about the relaxation of the combined RRC procedure.  However if it is specified, the value should at least cover the longest RRC reconfiguration delay (i.e. 16ms for non-segmentation case), and we should exclude the segmentation transmission in the RRC combined procedure. |
| Huawei, HiSilicon |  | We do not want to change the UE behaviour. This is also from the network point of view. |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

# 4 For Reference: Phase 1 Discussion

## 4.1 Phase 1: Redirection with MPS indication

[R2-2103042](file:///C:\evutukuri\work\5G\RAN2\docs\R2-2103042.zip) Redirection with MPS Indication Perspecta Labs, CISA ECD, T-Mobile, Ericsson, Qualcomm CR Rel-16 36.331 16.4.0 4579 2 C NR\_newRAT-Core, TEI16 R2-2102232

[R2-2103043](file:///C:\evutukuri\work\5G\RAN2\docs\R2-2103043.zip) Redirection with MPS Indication Perspecta Labs, CISA ECD, T-Mobile, Ericsson, Qualcomm CR Rel-16 38.331 16.4.1 2413 2 C NR\_newRAT-Core, TEI16 R2-2102233

[R2-2103044](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113bis-e\Docs\R2-2103044.zip) Redirection with MPS Indication Perspecta Labs, CISA ECD, T-Mobile, Ericsson, Qualcomm CR Rel-16 36.306 16.4.0 1804 1 C NR\_newRAT-Core, TEI16 R2-2102234

[R2-2103045](file:///C:\evutukuri\work\5G\RAN2\docs\R2-2103045.zip) Redirection with MPS Indication Perspecta Labs, CISA ECD, T-Mobile, Ericsson, Qualcomm CR Rel-16 38.306 16.4.0 0526 1 C NR\_newRAT-Core, TEI16 R2-2102235

|  |  |  |
| --- | --- | --- |
| Company | Position | Detailed Comments |
| Nokia, Nokia Shanghai Bell | TEI17 | The proposal would introduce new condition for setting highPriorityAccess establishment cause (overriding NAS behaviour). Since the modification of establishment causes might impact CT1 (see 24.501, clause 5.4.6), this may not be even TEI proposal. Anyway, as it's rather late for TEI16, this could be considered for Rel-17 (the TEI17 is planned to start from August 2021). |
| Qcom | Support |  |
| Docomo | Support | We support this proposal. This is important from our perspective because without the proposal the end-to-end priority handling for MPS remains incomplete.  As the proposal addresses an MT EPS fallback scenario among others, we believe the problems have to be addressed now in Rel-16. Delaying it to Rel-17 could mean less/delayed market support for the feature, and that incoming MPS for IMS voice/video cannot be used until wide VoNR rollout. |
| Ericsson | Support |  |
| MediaTek | Not in R16 | Similar view as Nokia.  We should avoid further optimization in at this stage of Rel-16. |
| Lenovo | TEI17 | We share the same views as Nokia/NSB due to implications to NAS. It should be noted that when a feature is introduced in Rel-X an early implementation in Rel-(X-1) is possible if there is support for it and technically feasible.  Regarding the AS aspects we have some comments:   * The UE support of the feature is proposed as optional w/o capability signaling. But then how does the NW know to set to mpsPriorityIndication flag in the RRC release message? * For RRC connection establishment in LTE it is proposed that the UE applies AC14 (for emergency services) and sets the establishment cause to “highPriorityAccess”. We wonder why the UE cannot set the establishment cause to “emergency”? |
| Perspecta Labs | Support | The four RAN2 CRs are planned to be complemented by a CR in the May CT1 meeting (originally submitted in C1-210094 – CT1#127bis-e in January in conjunction with the original CR submissions in RAN2#113e). CT1 CR adds a note (Section 4.5.4.1) for the handling of this case of release with redirection.    When UE RRC connects in LTE after this Release with redirection with mpsPriorityIndication it uses highPriorityAccess Establishment Cause, which provides prioritized handling of the RRC connection establishment, same to as if the UE was an AC=14 Multimedia Priority Service (MPS) subscriber. MPS is not the same as emergency services; MPS is a distinct prioritized service making use of only the ‘highPriorityAccess’ cause value. |
| Intel | Support | RAN2 could endorse the CRs and approve it at the plenary if CT1 CRs are also agreed/endorsed. |
| OPPO |  | We also have concern to introduce this in Rel16 in late stage. In addition we also have some questions as following:  1, if the CR is to address the MT case where UE is not MPS subscribed, then it is not clear how gNB/eNB can know this since it can only rely on information from core network e.g. ARP/QoS parameters?  2, if the CR is to address EPS fallack case, it is also not clear why we need redirection from LTE to NR?  3, the coversheet of CR says “The MPS priority indicator is cleared at the UE when the connection to the target network is successful” , but it seems it is not reflected in anywhere in the CR. Maybe proponents can clarify |
| Samsung | - | Similar view to Nokia and MediaTek: we are wondering whether category C or B can be agreed at this late stage.  Nevertheless, if it is agreeable by RAN2, the text needs to be improved: e.g., from the condition 'if the UE has set the mpsPriorityIndicator', mpsPriorityIndicator in LTE CR should be changed to *highPriorityAccess* as in LTE *establishmentCause*, and mpsPriorityIndicator in NR CR should be changed to mps-PriorityAccess as in NR *establishmentCause*? |
| ZTE | TEI17 | Similar view as Nokia and MediaTek. |
| Huawei, HiSilicon | We see some issues | As explained by other companies, there are issues to be addressed if we want to continue the discussion on these proposals:   1. CrossTSG TEI are basically forbidden. In this case there are clear implications in CT1 / NAS (e.g. see TS 24.501 4.5.2) and the agreement on what to do (e.g. CT1 CRs and RAN2 CRs) should be made at higher level (i.e. TSG), for example by creating a small work item where the work needed is justified and the impact on all TSG and WGs is clarified. 2. Globally for this type of features we should have the ability to have an optional capabily to be reported to the network, but this has to be coordinated across CT1 and RAN2. 3. For the reasons mentioned above, we cannot agree at this meeting and a discussion at TSG level is recommended. |
| Apple | TEI17 | So far we also prefer introducing this in TEI17. We could come back in RAN2 if CT1 agrees the CR. |
| Rakuten Mobile | Support | We agree with Docomo that this CR is necessary for E2E Priority handling. |
| Chairman |  | 1) There is a relation to NAS (and even a related CR in CT1), so even if agreeable, R2 could/should not agree the CRs. R2 could at most provide technically endorsed CRs to RAN Plenary. In General service priority should better be handled by NAS (AS handling this is IMHO like a band-aid), so CT1 indeed need to provide their blessing for this change.  2) The CRs are simple and follow the principle of enhanced voice fallback, so in RAN2 we indeed have the capacity and indeed it could be possible to consider these CRs to be consistency updates rather than completely new functionality.  3) On the Huawei comment, I don’t clearly understand why from AS point of view we would need a signalled capacbility, as the UE would ignore the IE if not recognized. I don’t clearly see why a NAS capability would be needed either, but I guess that could be verified by CT1.  4) Importantly, there are a cpl of operators requesting this. |

**Proposal 1:** For R2-2103042-45 aim to prepare technical endorsed CRs to RAN plenary (do the CRs now at this meeting), and decide at RP whether to do this at all, whether in R16/R17 and whether a WI is required, e.g. due to CT1 involvement or other aspects potentially requiring deepend discussion.

## 4.2 Phase 1: Initiation of RNA update

[R2-2103623](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113bis-e\Docs\R2-2103623.zip) Clarification on the initiation of RNA update Huawei, HiSilicon discussion Rel-16 TEI16

|  |  |  |
| --- | --- | --- |
| Company | Position | Detailed Comments |
| ZTE | Agree | We are okay with the proposed changes |
| Nokia, Nokia Shanghai Bell | Further check is needed | Access Category 2 got special treatment. At least TS24.501 reads “*barring checks will be skipped for this access attempt.*” That was the reason to treat the procedures for Access Category in a different way.  However, further check may be needed to ensure the scenario when two requests come together (RNA Update and Emergency call) is covered properly. |
| Qcom | Yes for the NR CR | We’re fine with the clarification to align with other part of spec that specified to allow RNA update when barring is lifted for access category 2 |
| MediaTek | Agree |  |
| Intel | Agree with intent |  |
| OPPO | Agree with intention but | We are not happy for early implementation for LTE |
| Samsung | Agree | The change is reasonable, and we are fine wth the proposed change. |
| CATT | Agree | We are fine with the modification |
| Huawei, HiSilicon | Proponents | This paper is for small consistency updates. After R2-2000687 has been agreed for usage of access category 2 for UAC for RNA update, we further check current spec and find out that there is still one correction missing in NR RRC spec. And in LTE RRC spec the whole AC2 thing is also missing. So we submitted this paper to make them aligned. |
| Apple | See comments | We checked the previous agreed NR CR R2-2000687 and think the similar change to LTE spec section 5.3.17.2 can be agreeable.  While the other change to NR spec Section 5.3.14.4 and LTE spec Section 5.3.16.4 is not needed. |

**Proposal 2:** There is support for the changes in R2-2103623 (on a high level, details for further discussion).

## 4.3 Phase 1: RRC Release cause for inter-RAT cell (re)selection in RRC\_INACTIVE

[R2-2103624](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113bis-e\Docs\R2-2103624.zip) Clarification on RRC Release cause for inter-RAT cell (re)selection in RRC\_INACTIVE Huawei, HiSilicon discussion Rel-16 TEI16

|  |  |  |
| --- | --- | --- |
| Company | Position | Detailed Comments |
| Chairman |  | I assume the intention here is to clarify cross-layer behaviour, and not really change behaviour (or what)? If that is the case, the discussion should consider that this is intended to be a bug-fix. |
| ZTE | Disagree | AS can inform NAS about the inter-RAT reselection and it is usually done by implementation and not limited to the case when UE falls from inactive to idle mode when inter-RAT cell reselection happens.  Thus we think this CR is not needed as NAS will not rely on the release cause to know that the inter-RAT selection happens. |
| Nokia, Nokia Shanghai Bell | Disagree | CR is not needed and this is not a correction but a behavioural change - if the cross-layer indication is missing, that could be done by changing RRC procedural text, but adding a new cause value would also impact CT1 specifications.  In fact upper layers will notify the change of RAT as AS provides information about broadcast information (e.g. SIB1 in NR and LTE) to upper layers (e.g. in NR 5.2.2.4.2 forward the cellIdentity to upper layers; forward the trackingAreaCode to upper layers). Hence, the CR is not needed. |
| QCOM | neutral | We agree with the issue, but we don’t see there is a need for spec change … behavior correction can be left to UE implementation to handle it. |
| MediaTek | Disagree | We think that UE implementation could handle this. No need to specify the release cause between UE RRC and UE NAS. |
| Intel | Disagree | While the intention seems OK, the NAS behaviour is to perform registration procedure. Wouldn’t NAS be required to do that anyway due to tracking area change after inter-RAT reselection? |
| OPPO | Disagree | We agree with QCOM |
| Samsung | Disagree | We do not think that a new cause for the case needs to be introduced, which is internal UE behaviour as Chairman pointed out. We do not see the need of change unless we receive the input from CT1. |
| CATT | Disagree | We think that UE implementation could handle this. |
| Huawei, HiSilicon | Proponents | We think this is a bug-fix, and can be fixed with small spec impact. If AS layer does not indicate explicit inter-RAT cell (re)selection cause to NAS layer in this case, NAS can’t initiate the registration procedure as required by SA2 due to lack of assistance information. |
| Apple | Disagree | We also prefer leaving this to UE implementation. |
| Ericsson | Disagree | We do not see the need to specify this cross-layer behavior, i.e. this can be left to UE implementation. We also do not see why this should be clarified only for this particular case. Furthermore we agree with Nokia, that adding a new cause value, is a functional change impacting CT1. |

**Proposal 3:** R2-2103624 is not agreed

## 4.4 Phase 1: Combined RRC procedures

[R2-2103467](file:///C:\evutukuri\work\5G\RAN2\docs\R2-2103467.zip) On combined RRC procedures Nokia, Nokia Shanghai Bell, Ericsson discussion Rel-16 TEI16 R2-2101319

[R2-2103464](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113bis-e\Docs\R2-2103464.zip) RRC processing delays for combined procedures Nokia, Nokia Shanghai Bell, Ericsson CR Rel-16 38.331 16.4.1 1288 8 F TEI16 R2-2101320

|  |  |  |
| --- | --- | --- |
| Company | Position | Detailed Comments |
| Chairman |  | Similar proposals were discussed before, If I recall correctly, CRs were not agreed then partly due to unwillingness to change current UE implementations that treats RRC messages sequentially and without specific optimization even if said RRC messages are sent in the same Transport Block. I understand that the proponents have modified the proposal to allow that, so we can consider again. |
| ZTE | Disagree with the CR | We agree there is an issue, but the main problem with the existing spec is with lack of SR resources and hence the resulting double-RACH. However, we don’t think the CR sovles this issue.  Note that the UE releases the lower layer configuration (specifically, the SR and the PUCCH resoures are released). When the reestablishment is received, the UE submits the reestablishment complete message to the lower layers and if the subsequent reconfiguration message has not yet been received/processed by the UE, this will result in a RACH attempt. The gNB may be able to solve this problem of double RACH by sending UL grant(s) to schedule the reestablishmentComplete message but the timing of such scheduling needs to take into account potential differences in the UE processing delay to be able to avoid the double RACH issue.  Even if a combined processing delay is defined, it is not the case that the UEs are mandated to delay the submission of Reestablishment complete message until the RRCReconfiguration is processed. If this is the intention, then this should be clarified (that the UEs are required to wait until they process the reconfiguration message before submitting the reestablishmentComplete to lower layers – this will require more changes). However, this also results in unnecessary delay for the overall procedure and instead the better approach is to allow sequential processing but to include L1 SR resources to be provided in the reestablishment message similar to what is done in LTE (as proposed in R2-2004618). |
| Nokia, Nokia Shanghai Bell | Proponent | The issue here is two-fold: 1) RRC re-establishment cannot be rejected and 2) RRC re-establishment doesn't allow reconfiguration of dedicated parameters. This means network has to accept all re-establishment requests and then reconfigure the UE or use the fallback mechanism.  ZTE: For 1) It is unclear to us why RRC re-establishment cannot be rejected. Of course the network can send RRCSetup in response to the re-establishment if it cannot go ahead with reestablishment. The fallback behaviour is an implicit reject mechanism that is allowed in NR (unlike in LTE). So, it is unclear why this is an issue.  **Nokia v3:** There is no RRC re-establishment reject-message: Network has to accept the request either via *RRCReestablishment* or with *RRCSetup* (i.e. fallback to regular connection setup). In both cases, connection is established and a RRCReconfiguration is needed afterwards to resume UP transmission. That is the basic design flaw in NR Rel-15. However, the main discussion we mention here is about 2), 1) is another issue entirely.  For 2), sure, we agree. This is the main issue (which is possible in LTE but not in NR). But seems we have different solutions in mind for this issue though.  Nokia v3: Since we both agree on the core problem, perhaps the best we can do is to acknowledge the problem and then consider the best solution for that?  There are different ways to approach this, and the CR only covers P3+P4. We would first like to understand what the UE problems are - LTE has already defined combined RRC messages for a similar use case, so there should be no principal problem for UEs with this. Without this CR, the combined procedures cannot be used.  ZTE: The difference is that in LTE, there is not only the combined processing time, but there is also the SR resource available in reestablishment message. So, LTE allows sequential processing of reestablishment and reconfiguration without double RACH issue and the combined processing delay helps with a overall time limit on the combined procedure. But in NR, we don’t have the first option (i.e. to have SR resources). So, this means that we either have to rely on combined processing (i.e. sequential processing is no longer allowed once combined processing delay is specified), or we will have double RACH. This is the issue that we want to highlight.  **Nokia v3:** The "double RACH" is likely not something that occurs: Typically network schedules UL grant blindly according to RRC processing time. This not only avoids RACH but reduces latency. If we want to enalbe "early SR", that is a different solution and still doesn't address the additional latency coming from two sequential RRC message processing.  To ZTE: the double RACH can be avoided if network uses blind UL grants - this was already discussed during LTE and is widely used within deployed networks. So that shouldn't be a big issue in NR, either.  ZTE: This was not a problem in LTE. So, we are not sure what is meant by the highlighted part above. LTE will not have the problem since basic L1 configuration (and SR resource) can be included in reestablishment message. Indeed NR deployements use blind UL grants, but this is not guaranteed to capture all possible processing times in the field. Eventually there will be some cases where some implementations are quicker than other and these will create the extra RACH unless the timing of the UL grant happens to be exactly correct.  **Nokia v3:** Blind UL grants for RRC UL responses were discussed during LTE Rel-8: Network knows from RRC processing delay when the UE is (at the latest) ready for the UL response to RRC procedures. It can always provide UL grant for UE at that time, which will be used for sending the UL RRC response. That means no RACH is needed for BSR.  As for "eventually some implementations are quicker than others", certainly, but this is still something that network can address. Hence, the lack of SR resources is not really a problem in this case.  The combined procedure doesn't mean the responses are delayed - this in fact reduces the delay: UP data can anyway only continue after the first reconfiguration, and normally this would require network to first wait for the UE response, then react to that, send reconfiguration and wait for the response. Here this is combined to the same procedure, which reduces the overall delay.  ZTE: The question is whether sequential processing is allowed or not for the reestablishment and reconfiguration with this proposal? If the UE doesnot delay the reestablishment complete until processing the reconfiguration (i.e. sequential processing is allowed), then it seems to us that the problem is not solved.  **Nokia v3:** RRC processing is sequential: UE does NOT consider other RRC messages until it has finished the previous message sequence.Network may send another message but this doesn't really help with knowing when the UE will process it (i.e. network cannot do blind grants as easily and there will be more delays). This is also captured in 38.331 subclause 5.1.2 : 5.1.2 General requirements The UE shall:  1> process the received messages in order of reception by RRC, i.e. the processing of a message shall be completed before starting the processing of a subsequent message;  NOTE: Network may initiate a subsequent procedure prior to receiving the UE's response of a previously initiated procedure. |
| QCOM | NO | Although the spec may allow transmission of the 2 RRC messages in the same TB, but this doesn’t mean that UE is expected to transmit one RRC Complete message (for both messages), or 2 seperate RRC Complete messages in the same TB. The UE behavior varies among UE vendors, and therefore any modification in the spec to mandate a specific UE behavior will be considered an NBC for some of the UE vendors. |
| MediaTek | Disagree | The UE implementation has to process the RRC message one by one which is clearly specified in RRC SPEC (quote below). Even if the NW send the two RRC message within same TB. The processing time should just be the sum of indivisual processing time. Define this joint procedure does not solve the issue mentioned in the paper. So, we don’t think the CR is needed.  ------- From 38.331 ------- 5.1.2 General requirements The UE shall:  1> process the received messages in order of reception by RRC, i.e. the processing of a message shall be completed before starting the processing of a subsequent message;  **Nokia v3:** To MediaTek: The processing time proposed in this is exactly the sum of RRC re-establishment (10ms) + RRC reconfiguration (10ms) = 20ms (as proposed in the CR). That was also our rationale and we would like to make sure that if this happens, network knows that the UE timing will be the sum of the two procedures. |
| Ericsson | Support | We agree with Nokia’s analysis. |
| Intel | Disagree | We also think this doesn’t solve the main issue or the double RACH issue that was discussed previously and mentioned by ZTE. A proper solution would be to provide configuration information in Reestablishment message if delay is considered an issue for re-establisment. It was previously argued that delay is not important for re-establishment procedure. |
| OPPO | Disagree | We agree with ZTE’s analysis |
| Samsung | - | We tend to agree with other UE vendors that the CR does not solve the main issue.  Maybe what we can do here is to confirm that NW may send the two RRC messages within same TB, which is not clearly captured in the specification? |
| Nokia v3 |  | We would prefer to at least acknowledge the issue now and then consider what can be done to fix it: We think this discussion already shows there is an issue to handle but there seem to be several views on what is needed to fix it. So the Samsung proposal would be fine as a first step to us. |
| CATT | Disagree | Agree with ZTE. |
| Huawei, HiSilicon |  | We think this proposal is identical to what was proppsed before (e.g. in RAN2#112), so we do not understand what “. I understand that the proponents have modified the proposal to allow that” refers to, maybe the proponents can clarify if the proposal has evolved at all in the last 6 months or so.  We are happy to continue the discussion on this issue, potentially allowing some discussion documents to be submitted to the next meeting to allow companies to agree on the problems and assumptions, and after that on how to solve them. |
| Apple |  | We have the same understanding as Chair.  Currently UE is allowed to treat the RRC messages sequentially and without optimization.  If some clarification is needed, we can clarify this logic in the spec, i.e. for any combined RRC procedure, the procedure time requirement is the sum of the processing time of each independent RRC procedure. |
| Chairman |  | Well, the proponents seems correct that the RRC specification and old RAN2 agreements insinuates that “combined” procedures are allowed, so it would be reasonable to assume that UEs are capable to handle multiple RRC DL messages in one TB, but maybe this need to be checked.  The main issue brought up by the proponents seems to be that from processing delay requirements, it could be currently inferred that the UE is not expected to await processing of the second procedure before sending the UL reply message for the first DL message. I understand that the purpose of the CR is to have relaxed processing time for the first procedure, to allow the UE to send the first reply after the execution of the second procedure. The CR seems to enable such option, while not mandating anything.  I understand that the ZTE proposal to instead include reconfiguration capabilities in RRC re-establishment was indeed discussed in R15 (this is the LTE baseline) but was not done by choice. |

**Proposal 4:** Continue the discussion on R2-2103467 with the assumption that we’d agree later the release applicability for TS change, if any is agreeable.

a) Clarify whether multiple DL RRC messages in a TB is currently considered allowed (e.g. according to current UE implementations), in particular for the two cases on the table in R2-2103467. If not, whether it is worthwhile to enable this. Note that this seems to have been intended for R15. Discuss whether a TS change is desireable to clarify the current situation.

b) Check whether there is interest to allow relaxation of processing time, such that reply to first procedure can be sent after second procedure is finished.

# 5 Conclusions phase 1

**Proposal 1:** For R2-2103042-45 aim to prepare technical endorsed CRs to RAN plenary (do the CRs now at this meeting), and decide at RP whether to do this at all, whether in R16/R17 and whether a WI is required, e.g. due to CT1 involvement.

**Proposal 2:** There is support for the changes in R2-2103623 (on a high level, details for further discussion).

**Proposal 3:** R2-2103624 is not agreed

**Proposal 4:** Continue the discussion on R2-2103467 with the assumption that we’d agree later the release applicability for TS change, if any is agreeable.

a) Clarify whether multiple DL RRC messages in a TB is currently allowed, in particular for the two cases on the table in R2-2103467. If not, whether it is worthwhile to enable this. Note that this seems to have been intended for R15. Discuss whether a TS change is desireable to clarify the situation.

b) Check whether there is interest to allow relaxation of processing time, such that reply to first procedure can be sent after second procedure is finished.

# 6 References

[1] R2-113bise Chairman notes 2021-04-11.docx