**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 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

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# 3 Discussion

## 3.1 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

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| 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*? |
| 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. |

## 3.2 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

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| 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. |
| 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. |

## 3.3 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

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| 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. |
| 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. |

## 3.4 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

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| 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. |
| 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. |

# 4 Conclusion

# 5 References

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