3GPP TSG-RAN WG2 #118-e draftTdoc R2-2206218

Electronic meeting, 9th - 20th May 2022

Agenda Item: 6.12.2.2

Source: Ericsson (Rapporteur)

Title: Report from [AT118-e][102][RedCap] RRC CR (Ericsson) – PH2

Document for: Discussion, Decision

# 1 Introduction

This is the report from the second phase of the offline discussion below:

**[AT118-e][102][RedCap] RRC CR (Ericsson)**

Updated scope: 1. continue the discussion on the remaining RedCap WI-specific RILs, based on [R2-2206192](file:///C:\Data\3GPP\RAN2\Inbox\R2-2206192.zip); 2. For inter-RAT mobility from LTE to NR, discuss what happens if the UE accesses a 20MHz non-RedCap cell / whether it’s acceptable not to specify a new UE behaviour; 3. For RSRP threshold offset for 1Rx UE, discuss whether the offset should be configurable (vs hard-coded in RAN4 spec) and also draft the LS to RAN4 according to agreements.

Updated intended outcome: Summary of the offline discussion with:

·         List of RILs for email agreement

·         List of RILs for online discussion

·         Conclusion on UE behaviour when the UE is handed  over to a 20MHz non-RedCap cell

·         Conclusion on configurability for offset for 1Rx UE

·         Draft LS to RAN4

Deadline (for companies' feedback): Tuesday 2022-05-17 20:00 UTC

Deadline (for rapporteur's summary in R2-2206218): Tuesday 2022-05-17 22:00 UTC

Proposals/TP marked "for agreement" in R2-2206218 not challenged until Wednesday 2022-05-18 10:00 UTC will be declared as agreed via email by the session chair.

Status: ongoing

In RAN2#118-e, there was an online discussion which was captured in [R2-2206192](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2206192.zip). During the online discussion the following agreements were made:

**Agreements**:

1. The following RILs are agreed: H506, V163, H509, H514, Z033, H515, M608, H517, V161, Z034, H522
2. The following RILs are agreed: V168, V169
3. The following RILs are not pursued: X115, X112, V165, H525, H526.
4. O374 is not pursued.
5. X116 is not pursued.
6. RIL 510 is agreed.
7. FW001 is agreed.
8. S952 is not pursued
9. Z035 is agreed with the following change: "The NW configures SSB-based RA (and hence RACH-ConfigCommon) only for UL BWPs if the linked DL BWPs (same bwp-Id as UL-BWP) are the initial DL BWPs or DL BWPs containing the SSB associated to the initial DL BWP or for RedCap UEs DL BWPs associated with *nonCellDefiningSSB*."
10. V164 is not pursued.
11. H513 and H516 are not pursued.
12. H518 is not pursued.
13. X119-2 is not pursued.
14. V166 is not pursued.
15. Number of Rx supported by a RedCap UE is provided in *UERadioPagingInformation*.

In this document we continue the discussion for the following proposals, and the discussions on inter-RAT mobility from LTE to NR and RSRP threshold offset for 1Rx UE:

**Proposals for further discussion**

Proposal 3 Discuss H704.

Proposal 4 The following RIL is agreed: H705 (as captured in R2-2206021).

Proposal 5 For H520 wait until the related discussion in offline 105 is concluded.

Proposal 7 The following RILs are agreed: X110, X111.

Proposal 8 Discuss I051 and N016.

Proposal 10 V162 is agreed with the following change; replace “consider“ with “perform

Proposal 12 H507 is agreed in principle; discuss how to implement the change, i.e., NOTE and/or normative text.

Proposal 16 Discuss H511/ C271 regarding whether the parameter should indicate “allow” or “reject”.

Proposal 17 For H512 wait until the related discussion in offline 105 is concluded.

Proposal 19 Discuss Z036, N107, and H523.

Proposal 20 Discuss X119-1.

Proposal 25 Discuss X114.

Proposal 26 Discuss S953.

Proposal 29 Regarding the indication for DRX support in idle and inactive mode; wait until the related discussion in offline 110 is concluded.

Proposal 30 Discuss whether UEs configured with eDRX should consider stored system information to be invalid after 24 hours.

# Contact Information

Please fill in the following table for contact information:

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| --- | --- |
| Company | Contact person - [email@address.com](mailto:email@address.com) |
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# 2 Discussion on RILs and open issues

## 2.1 Remaining RILs to discuss

**Q 2.1.1** In phase 1, 2 companies think further discussion is required for H704.Considering the discussion in R2-2205512, do you think it should be possible to apply the NCD-SSB functionality to non-RedCap UEs?

Please elaborate your reply, especially if you do and provide a detailed evaluation of the potential changes/discussion required to adopt such functionality.

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| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes | As explained in R2-2205512, NCD-SSB can enables the following benefits for non-RedCap UEs:   * For network, it offers more configuration flexibility, e.g. in configuring the bandwidth and location of UE’s dedicated BWP, the type of RS to configure for RLM/BFD/PL, etc. * For UE, narrower BWP can be configured and save its power.   In our understanding, configuration of NCD-SSB is per-cell (not per-UE), so extending NCD-SSB to non-RedCap UEs does not require additional resource commitment from network. And no technical issues have been identified in the previous discussion on extending NCD-SSB to non-RedCap UEs. We therefore suggest companies give the proposal another consideration and support it in R17. |
| Intel | No | RAN2 already had conclusion on this,   1. The discussion on whether a non-RedCap UE should be able to use NCD-SSB instead of CD-SSB is deprioritized in Rel-17. |
| Xiaomi | No | The discussion on whether NCD-SSB functionality can be applied to non-RedCap UEs was agreed to be deprioritized earlier. |
| Huawei, HiSilicon | See comments | Based on the agreement cited by Intel, we need to postpone this to next meeting, since other issues in this document are more critical/high-priority. |
| Samsung | No | We share the view with Intel. |
| OPPO | No | Share the same view as Intel |
| Sequans | Yes, but | Agree with QC – this has benefit to non-RedCap UEs, and no technical issues have been brought by opponents, including more than minior spec impact. However, the agreement has been taken and there does not seem to be a will to revert it. |
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**Summary – Q 2.1.1**

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Based on the observations above, the rapporteur proposes the following:

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**Q 2.1.2** In phase 1, one company indicated that the change proposed in H705 is not essential and can be postponed.

Do you agree with the change proposed in RIL H705 as implemented in R2-2206021? Please elaborate your reply, especially if you do not, and provide a resolution/text proposal that addresses your concerns considering the feedback from companies, if provided.

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| **Company** | **Yes/No** | **Comments** |
| Intel | Yes | It is not essential, but we also do not see any issue to implement it in Rapporteur CR. |
| Xiaomi | Yes | H705, do not see the problem. |
| Huawei, HiSlicon | Yes | If rapporteur sees the gain to implement this, it should be fine to be merged in the rapp CR. |
| Samsung | Yes | We are fine with the name in R2-2206021 but can add a dash after PRB (additionalPRB-Offset). |
| OPPO | Yes |  |
| Sequans | Yes | Agree with Samsung |
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**Summary - Q 2.1.2**

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Based on the observations above, the rapporteur proposes the following:

1. ???

**Q 2.1.3** In Phase 1, some companies think that it would be good to wait for H520 until the related discussion in offline 105 is concluded. Considering the status of the discussion in offline 105; do you agree with the change proposed in RIL H520 as implemented in R2-2206021?

Please elaborate your reply, especially if you do not, and provide a resolution/text proposal that addresses your concerns considering the feedback from companies, if provided.

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| **Company** | **Yes/No** | **Comments** |
| Intel | Yes | Agree, it is aligned with proposal in 105. |
| Xiaomi | See comments | From AT105:   1. Clarify in the RRC field description that the paging search space is configured in an initial BWP only if that BWP includes the CD-SSB. 2. RAN2 confirms that if RedCap-specific initial DL BWP does not contain CD-SSB and CORESET#0, then this BWP will not be configured with a paging search space in any RRC state. In this case, the RedCap UE in RRC\_CONNECTED state is not required to read paging.   We have agreed that paging search space will not be configured on RedCap-specific initial DL BWP not containing CD-SSB and CORESET#0.  The question is whether Redcap UE need to read the SS for paging, SI from PDCCH-ConfigCommon configuration from legacy initial BWP in case RedCap-specific initial DL BWP NOT contains CORESET#0.  In Last meeting, we have agreed that :   * In case RedCap-specific initial DL BWP contains CD-SSB and CORESET#0, PDCCH-ConfigCommon is included in the configuration of RedCap-specific initial DL BWP. RedCap UEs don't need to read the PDCCH-ConfigCommon configuration from legacy initial BWP if RedCap-specific initial BWP is signalled   If the UE need to read the SS for paging, SI from PDCCH-ConfigCommon configuration from legacy initial BWP in case RedCap-specific initial DL BWP NOT contains CORESET#0, it seems we have introduced a different behavior for UE.  And it also means that if a field in RedCap-specific initial BWP is absent, the UE should follow the field signalled in legacy initial BWP. Note this was excluded in last meeting considering the great effort that we need to identify the absence of a parameter means “release” or means “using the one from legacy” thus we have agreed that RedCap-specific BWP, both common and dedicated configurations are provided using full configuration, i.e., delta configuration is not supported as captured in RAN2#117 meeting minutes.  So we think it is better that UEs read the PDCCH-ConfigCommon configuration from its RedCap-specific initial BWP to follow what agreed in RAN2 117 as a unified solution. |
| Huawei, HiSilicon | Yes | 1st sentence is aligned with following agreement and captured in R2-2206021   |  | | --- | | 5. Clarify in the RRC field description that the paging search space is configured in an initial BWP only if that BWP includes the CD-SSB.  6. RAN2 confirms that if RedCap-specific initial DL BWP does not contain CD-SSB and CORESET#0, then this BWP will not be configured with a paging search space in any RRC state. In this case, the RedCap UE in RRC\_CONNECTED state is not required to read paging. |   2nd sentence can be discussed whether it is the correct understanding  “This field should be configured with the same value as the one in *initialDownlinkBWP*, if included in the RedCap specific initial DL BWP and it includes CD-SSB and the entire CORESET#0.” |
| Samsung | Yes but | The remaining issue (i.e. should be same value or can be different value) should also be clarified, which is now discussing in other thread in 105 now. That part should also be captured later, irrespective of the conclusion there. |
| OPPO | Yes |  |
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**Summary – Q 2.1.3**

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Based on the observations above, the rapporteur proposes the following:

1. ???

**Q 2.1.4** Do you agree with the change proposed in RILs X110 and X111?

Please elaborate your reply, especially if you do not, and provide a resolution/text proposal that addresses your concerns considering the feedback from companies, if provided.

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| **Company** | **Yes/No** | **Comments** |
| Intel | Yes | Ok to capture them. |
| Xiaomi | Yes |  |
| Huawei, HiSilicon | Yes |  |
| Samsung | Yes | - |
| OPPO | Yes |  |
| Sequans | Yes |  |
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**Summary – Q 2.1.4**

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Based on the observations above, the rapporteur proposes the following:

1. ???

**Q 2.1.5** This question is about RILs I051 and N016. In Phase 1, 9 companies responded in total. 2 companies think RILs I051 and N016 should not be pursued, whereas 6 companies support the change in principle and 1 company thinks further discussion is required.

Do you agree with the changes proposed in RILs I051 and N016 considering the comments provided in phase 1? Please elaborate your reply, regardless of whether you do or not and provide a resolution/text proposal that addresses your concerns, if you agree with the intention considering the feedback from companies, if provided.

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| **Company** | **Yes/No** | **Comments** |
| Intel | Yes | proponents |
| Xiaomi | No strong view | OK to agree with N016. Also ok to keep as it is. |
| Huawei, HiSilcon | No | The only benefit is for saving 1bit. But the impacts are:   * We need to update the procedure text [No sufficient time to check if the update works well]; * We change the function/agreement: ”If RedCap-specific IFRI is absent from broadcast SI, the UE considers the cell does not support RedCap.”   We need strong motivation to clarify why the current spec is broken.  Also, we see no TP provided from RIL N016, especially on the procedure text.  Also, on the TP from I051, ENUMERATED {true}, how come changing from two valus into one values for one optional ENUMERATED field can save bit in SIB1?  Also, it is not clear whether we need to move halfDuplexRedCapAllowed together, since it is associated in the procedture text.  We really appreaciate the motivation of saivng bit, but disagree the CR considering the functionality impact. |
| Samsung | Yes | In addition, halfDuplexRedCapAllowed should also be moved to the IE cellBarredRedCap, based on the conclusion. |
| OPPO | Yes | Agree with N016. |
| Sequans | No | Agree with HW |
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**Summary – Q 2.1.5**

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Based on the observations above, the rapporteur proposes the following:

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**Q 2.1.6** This question is regarding RIL V162. In total 9 companies responded to the related question in phase 1. 8 companies support the change proposed in V162 in principle and support replacing “consider” with “perform”, whereas one company thinks it would be better to discuss further and 2 companies have the following suggestions to replace “consider cell re-selection to other cells on the same frequency as the barred cell as specified in TS 38.304 [20]” with

Option 1: “perform barring based on *intraFreqReselectionRedCap* as specified in TS 38.304 [20]” (MTK)

Option 2: “perform barring in accordance with *intraFreqReselectionRedCap* as specified in TS 38.304 [20]” (OPPO)

Based on the discussion in phase 1, rapporteur observes that there is support for replacing “consider” with “perform”. In phase 2, the question is whether further changes, as suggestions above in options 1 and 2 are required.

Do you think that further changes are required in addition to replacing “consider” with “perform”? Please elaborate your reply and if you think further changes are required, indicate which one of the options above you would support.

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| **Company** | **Yes/No** | **Comments** |
| Intel | Yes | No strong opinion on whether to implement option 1 or option 2. |
| Xiaomi | Yes | Option1 or option2 is ok.  Replacing “consider” with “perform” is still confusing. |
| Huawei, HiSilicon | Slightly prefer no | How to use and when to use intraFreqReselectionRedCap are already clearly captured in TS 38.304 [20].  Anyway, fine to go with majority. |
| Samsung | No | No strong view though. |
| OPPO | Yes | Either Option 1 or Option 2 is ok |
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**Summary – Q 2.1.6**

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Based on the observations above, the rapporteur proposes the following:

1. ???

**Q 2.1.7** This question is regarding RIL H507. In phase 1, 7 companies responded in total. 4 companies support the change whereas 3 companies think “maybe”

Do you agree with the proposed change in RIL H507? Please elaborate your reply especially if you do and provide your opinion on whether a NOTE, as suggested, would do.

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| **Company** | **Yes/No** | **Comments** |
| Intel | Maybe | No strong opinion on whether the Note should be added. It would be good to capture something in RAN4 spec. |
| Xiaomi |  | No strong view. Maybe we can add it. |
| Huawei, HiSlicon | Yes | NOTE is fine. |
| Sequans | Yes | NOTE is fine. |
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**Summary – Q 2.1.7**

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Based on the observations above, the rapporteur proposes the following:

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**Q 2.1.8** This question is about RILs H511 and C271. In phase 1, 8 companies responded in total. Two companies do not support the proposed changes, 2 companies do not have any strong view, and 4 companies think that the change is needed.

Do you agree with the changes proposed in RILs H511 and C271? Please elaborate your reply.

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| **Company** | **Yes/No** | **Comments** |
| Intel |  | Do not see strong different between allow or reject. As clarified by Ericsson, it depends on the assumption whether more frequencies support RedCap or not. We are ok to follow majority view on this. |
| Xiaomi | Yes | Ok for this. |
| Huawei, HiSilicon | Yes | Better follow the agreement. |
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**Summary – Q 2.1.8**

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Based on the observations above, the rapporteur proposes the following:

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**Q 2.1.9** This question is about RIL H520. In phase 1, 7 companies responded in total, and all companies proposed to wait until the related discussion in offline 105 is concluded.

Rapporteur thinks that this RIL will be resolved as part of the offline discussion [105] and thus suggests that there is no need for further discussion in this offline.

Do you agree with rapporteur’s observation above? Please elaborate your reply, especially if you do not and provide a resolution/text proposal that addresses your concerns.

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| **Company** | **Yes/No** | **Comments** |
| Intel | Yes with comments | Agree with Ericsson’s comments in phase 1 discussion, i.e. only following sentence is needed:  “This field is absent for the RedCap specific initial DL BWP, if it does not include CD-SSB and the entire CORESET#0“ |
| Xiaomi |  | See comments on Q.2.1.3. |
| Huawei, HISilicon | No | Same as **Q 2.1.3.** |
| Samsung | Yes but | As said above, the conclusion from 105 should also be captured later, irrespective of the conclusion there. |
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**Summary – Q 2.1.9**

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Based on the observations above, the rapporteur proposes the following:

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**Q 2.1.10** This question is about RILs Z036, N107, and H523. In phase 1, 7 companies responded in total, and companies have a mixture of views so further discussion was required.

Do you agree with the proposed change(s)? Please elaborate your reply, regardless of whether you do or not and provide a resolution/text proposal that addresses your concerns considering the feedback from companies in phase 1.

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| **Company** | **Yes/No** | **Comments** |
| Intel | No | Z036/H523: As commented by ZTE, the sub-fields inside BWP-DownlinkCommon is setupRelease+Need M structure, and therefore Z036 is not needed.  N107, not needed. |
| Xiaomi | - | We do not need to change to setupRelease+Need M structure since Sub IEs are Need M.  But we still wondered whether his field is mandatory in some case. We admit that NW may choose not to configure a RedCap specific initial BWP if the legacy initial BWP is <20MHz and can be used for RedCap operation.  How about other cases:  If the legacy BWP exceeds the RedCap UE’s maximum bandwidth.  Can be discussed with X119-1. |
| Huawei, HiSilicon | No | It seems the WF from phase 1 comments is none of them to be agreed. |
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**Summary – Q 2.1.10**

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Based on the observations above, the rapporteur proposes the following:

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**Q 2.1.11** This question is about the RIL X119-1. In phase 1, 7 companies responded in total. 4 companies do not support the change, whereas 2 companies support in principle with different suggestions on how it should be captured. One company thinks further discussion may be helpful.

Do you agree with the proposed changes? Please elaborate your reply, regardless of whether you do or not and provide a resolution/text proposal that addresses your concerns considering the feedback from companies in phase 1.

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| **Company** | **Yes/No** | **Comments** |
| Intel | No | Agree ZTE’s analysis in Phase 1, i.e. the field may not be configured during HO. |
| Xiaomi | - | See comments on Q.2.1.10. |
| Huawei, HiSilicon | No strong view | Fine to do nothing, if it is the majority.  But, we may need to clarify that RedCap specific BWP field is not mandatory for HO case. |
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**Summary – Q 2.1.11**

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Based on the observations above, the rapporteur proposes the following:

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**Q 2.1.12** This question is about RIL X114. In phase 1, 8 companies responded in total. 2 companies think that the change is not needed, whereas 2 companies stated the opposite. The rest does not have any strong preference or think that further discussion is needed.

Do you agree with the proposed change(s)? Please elaborate your reply, regardless of whether you do or not and provide a resolution/text proposal that addresses your concerns considering the feedback from companies in phase 1.

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| **Company** | **Yes/No** | **Comments** |
| Intel | Maybe | The issue “whether the scenario is valid or not.” should be discussed in RAN1.  “If the RedCap specific initial DL BWP does NOT contain the entire CORESET#, the network configures the *commonControlResourceSet* in *SIB1* for Redcap so that it is NOT contained in the bandwidth of CORESET#0.“ |
| Xiaomi | Yes | Need to discuss.  If the RedCap specific initial DL BWP does NOT contain the entire CORESET#0, then the additional common control resource set configured for Redcap is not contained in the bandwidth of CORESET#0.  The current spec says“ The network configures the *commonControlResourceSet* in *SIB1* so that it is contained in the bandwidth of CORESET#0.“ Obviously, it is not considering the BWP may not containing CORESET#0.  We suggest it to be clarified.  OK to check with RAN1. |
| Huawei, HiSilicon | Postpone? | Maybe we can wait for further R1 agreement/discussion. It is more like clarification, which can be postponed to next meeting. |
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**Summary – Q 2.1.12**

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Based on the observations above, the rapporteur proposes the following:

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**Q 2.1.13** This question is about RIL S953. In phase 1, 7 companies responded in total. 2 companies think that the change is not needed, whereas 2 companies stated the opposite. The rest of the companies do not have any strong preference or think that further discussion is needed.

Do you agree with the proposed change(s)? Please elaborate your reply, regardless of whether you do or not and provide a resolution/text proposal that addresses your concerns considering the feedback from companies in phase 1.

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| **Company** | **Yes/No** | **Comments** |
| Intel | No | Do not see the need to change anything. We should follow existing SI request, and if Msg1 based SI request cannot be applied, the RedCap UE shall use Msg 3 based SI request. |
| Xiaomi | No | For SI requesting, UE does not need to be early identified by the NW since the Redcap UE acquire the same SIB with eMBB UE. And after RAR receiving(which is within coreset0 and within Redcap’s supported bandwidth), UE do not need to transmit in msg3. Why the SI request configuration cannot be reused? |
| Huawei, HiSilicon | No | RedCap UEs can use the legacy initial UL BWP for Msg1 based SI request, if it does not exceed the RedCap UE maximum bandwidth. Otherwise, RedCap UEs use Msg3 based SI request. |
| Samsung | Yes | **This issue is also being discussed in offline [116][RedCap] MAC aspects.**  In legacy two initial UL BWPs are configured.   * Initial UL BWP on NUL * Initial UL BWP on SUL   For each of these initial UL BWP, SI request resources are supported.  A new Initial UL BWP for redcap UE is introduced on NUL. Redcap UE performs RACH on this BWP if configured. Network should have the option to configure Msg1 or Msg3 based SI request for redcap specific initial UL BWP in same manner as done for initial UL BWP on NUL and SUL.  Since RACH is supported on this new BWP, Msg1 based SI request should be supported on this BWP and SI request resources needs to be defined for this new BWP by simply adding the following parameter in SIB1  *si-RequestConfigRedCap-r17* *SI-RequestConfig* OPTIONAL |
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**Summary – Q 2.1.13**

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Based on the observations above, the rapporteur proposes the following:

1. ???

## 2.2 RRC related issues discussed separately

In this section, we discuss the open RRC related issues brought up in the contributions below:

[R2-2204819](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2204819.zip) UE Capability and System Information for eDRX vivo, Guangdong Genius

[R2-2205523](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2205523.zip) SIB validity with eDRX MediaTek Inc.

[R2-2204723](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2204723.zip) Discussion on inter-RAT mobility from LTE to NR OPPO

[R2-2204814](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2204814.zip) [V170] Discussion on Inter-RAT Mobility from LTE to NR for RedCap vivo, Guangdong Genius

[R2-2205036](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2205036.zip) Inter-RAT mobility from LTE to NR Huawei, HiSilicon

[R2-2205904](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2205904.zip) Handover from E-UTRA from legacy eNB to legacy gNB Ericsson

[R2-2205786](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2205786.zip) RSRP thresholds for 1 Rx RedCap Ues Nokia, Nokia Shanghai Bell

[R2-2206024](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2206024.zip) Configuring margin for 1 Rx RedCap UEs Ericsson

**Q 2.2.1** This question is about the indication for DRX support in idle and inactive mode. Rapporteur has observed that this issue will be resolved as part of the offline discussion [110] and thus suggests that there is no need for further discussion in this offline.

Do you agree with rapporteur’s observation above? Please elaborate your reply, especially if you do not and provide a resolution/text proposal that addresses your concerns.

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Nokia | Yes | There is another discussion ongoing as rapporteur noted. |
| Qualcomm | Yes |  |
| Intel | Yes | Agree, we do not need to repeat the discussion. |
| Xiaomi | Yes |  |
| Intel | Yes | Agree, we do not need to repeat the discussion. |
| Samsung | Yes |  |
| OPPO | Yes |  |
| Sequans | Yes |  |
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**Summary – Q 2.2.1**

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Based on the observations above, the rapporteur proposes the following:

1. ???

**Q 2.2.2** This question is about whether UEs configured with eDRX should consider stored system information to be invalid after 24 hours. In phase 1, 7 companies responded in total. One company supports the change whereas 2 companies do not. 4 companies think further discussion is required.

Do you agree with the proposal? Please elaborate your reply, regardless of whether you do or not and provide a resolution/text proposal that addresses your concerns considering the feedback from companies in phase 1.

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Nokia | No | Configuring different system information validity time for different devices will increase the system complexity |
| Qualcomm | No | We think further discussion is needed.  In our view, having a single, fixed value for all UEs may not be the right thing for NR. For example, a 24 hr validity time for a UE with 2.56s eDRX cycle might be too long, while it makes sense for a UE with 3-hr eDRX cycle. |
| Intel | See comment | The intention seems reasonable however it seems more logical if this kind of config is defined as UE-specific (i.e. provided in *RRCRelease*) as the storage requirement may be very different for a UE config with eDRX of 2.56sec vs very long values.  In addition, the proposed TP in the procedural text would also need to check whether *eDRX-Allowed* is set by the network. |
| Xiaomi | No | Seems an optimization. Unlike in NB-Iot, the UEs may not be configured with such a large eDRX cycle( Note that we also have introduced eDRX of 2.56s) then seems 3 hrs in current spec is sufficient. |
| Huawei, HiSilicon | No | 24hour latency is not acceptable/proper for RedCap UEs.  The 24hour was introduced in LTE, not due to eDRX. |
| Samsung | No | Not sure different validity time is reasonable. Further discussion seems needed as QC mentioned. |
| OPPO | No |  |
| Sequans | No | 24h is too long as a single value for all UEs. We are OK to consider a time limit related to the eDRX cycle length as a future optimization, but this seems like quite a complexity for the NW, and in any case this is not critical at this point. |
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**Summary – Q 2.2.2**

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Based on the observations above, the rapporteur proposes the following:

1. ???

**Q 2.2.3** In RAN2#118-e, there is an ongoing discussion on inter-RAT mobility from LTE to NR for RedCap UEs. The following agreement has been made during the first offline session: “Network implementation should avoid handover attempts from source eNB to legacy gNB that does not support RedCap. FFS is specific UE behaviour should also be specified”

Do you think there is a need to specify UE behaviour to address this scenario? Please elaborate your reply and if you think there is a need to do so provide a text proposal (and the corresponding specification) that addresses your concerns considering the feedback from companies provided during the related online discussion.

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Nokia | No | Can be left up to NW implementation. |
| Qualcomm | No | It can be left up network implementation. |
| Intel | No | UE based solution cannot resolve ping-pong issue. We can just rely on existing UE behavior, i.e. if the configuration exceeds the UE capability, or cannot be complied by the UE, then the UE will trigger the reestablishment. We do not see the need to introduce new UE behavior on this. |
| Xiaomi | No | Can be left up to NW implementation. |
| Huawei, HiSilicon | Yes | Network implementation should do something. But there is the case the **legace eNB not upgraded can do nothing, when the tager gNB provides the configuraion not exceeding UE capaiblity**. We suggest to capture both NW and UE implmentation as NOTEs.  NOTE: It is up to the network implementation, if possible, to avoid the handover attempts of RedCap UE to the target NR cell not supporting RedCap. If the RedCap UE determines the target NR cell does not support RedCap, by considering the configuration (e.g. *intraFreqReselectionRedCap*) in SIB1 of the target cell, the UE should initiate the connection re-establishment procedure as specified in clause 5.3.7. |
| Samsung | No | It can be left up network implementation. |
| OPPO | No | Can be left to NW implementation. |
| Sequans | Yes | We really don’t see the issue with the NOTE, as it is already agreed that RedCap UEs should not access non-RedCap cells, and that a NOTE is not normative. We would even have preferred it to be normative text, but as a last effort to compromise, the NOTE as suggested by HW at least captures both aspects of a solution.  In any case, NW implementation is complementary, not contradictory to a UE-based solution. Both solutions do not give a perfect solution. It is a shame that companies did not want to consider the solution from ZTE.  As for ping-pong issues, it seems much easier to recognize from the NW side than to implement everything needed for the correct handover, as this is a more general issue. |
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**Summary – Q 2.2.3**

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Based on the observations above, the rapporteur proposes the following:

1. ???

**Q 2.2.4** In RAN2#118-e, there is an ongoing discussion on RSRP thresholds for 1 Rx RedCap UEs. The following agreement has been made during the first offline session:

“Send an LS to RAN4 saying that RAN2 understands that RedCap UE with 1 Rx branch applies offset to the all RSRP thresholds which are applicable to RedCap (not only the thresholds explicitly mentioned in the incoming RAN4 LS), asking RAN4 for confirmation. In the LS, also ask RAN4 about their view on whether RedCap UE with 1 Rx branch applies offset to REL-16 low mobility and/or not at cell edge conditions (indicating that RAN2 is not sure about the low mobility condition). FFS if anything else needs to be included in the LS

In R2-2206024, it has been observed that a configurable RSRP offset provides flexibility and is future proof compared to a predefined offset in the specification. The following proposal is made:

“**Introduce a configurable parameter in SIB1 that indicates RSRP offset for UEs with 1 Rx branch.**”

Do you agree with the proposal? Please elaborate your reply, especially if you do not..

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Nokia | Yes | Configurability improves the flexibility i.e. NW can choose or adjust the RSRP offset for 1Rx branch devices. |
| Qualcomm | No | This offset is introduced solely because the hardware difference between 1Rx and 2Rx devices. It is not something configured by network.  Some companies mentioned a configurable offset can enable more flexibility in the configuration of cell re/-selection. We do not think this offset is the right tool for that purpose, as it is used by all RSRP related measurement. |
| Intel | No | Agree with Qualcomm. |
| Xiaomi | No | The offset introduced in RAN4 has already compensated this. |
| Huawei, HiSilicon | Maybe | We can introduce this only for cell selection purpose, if other companies have some concern, see below Q 2.2.5. In our understanding, RAN4 will not specify the requirement related to cell reelection in IDLE, hence the offset may be better to implemented by RAN2 with signaling. |
| Samsung | No | In LS (i.e., R4-2206951) from RAN4, RAN4 explicitly indicated the offset is fixed and specified in RAN4 spec, as follows:   |  | | --- | | RAN4 recommends that RedCap UE determines the above RSRP related thresholds for corresponding procedure as follows:   * UE using 2 Rx branches determines any of the above threshold (H1) based on existing signaling and RSRP range defined in TS 38.133. * UE using 1 Rx branch determines any of the above threshold (H2) as follows:   H2 = H1 + offset  Where, “offset” is fixed value in dB specified in RAN4 specification and corresponds to the magnitude of the difference between RSRP accuracies for 1 Rx branch and 2Rx branches. | |
| OPPO | No |  |
| Sequans | No | Since the value is fixed in RAN4 spec, adding now a value in SIB does not bring real benefit. If future use is identified, a parameter can be introduced then with the same impact on specification. |
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**Summary – Q 2.2.4**

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Based on the observations above, the rapporteur proposes the following:

1. ???

**Q 2.2.5** Regarding the discussion in Q 2.2.4 based on R2-2206024; it has also been observed that without RedCap specific cell (re-)selection criteria, 1 Rx RedCap UEs would experience a smaller cell size than 2 Rx RedCap and legacy UEs. The following proposal has been made to address this issue:

In R2-2206024, it has been observed that a configurable RSRP offset provides flexibility and is future proof compared to a predefined offset in the specification. The following proposal is made:

“**Support optional configuration of RedCap specific Qrxlevmin\_1Rx and Qqualmin\_1Rx.**”

Do you agree with the proposal? Please elaborate your reply, especially if you do not.

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Nokia | Yes with comments | These are not the only thresholds which needs the offset. [R2-2205786](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2205786.zip) mentions e.g. *cg-SDT-RSRP-ThresholdSSB, sdt-RSRP-Threshold*. Offset for these needs to be agreed as well. |
| Qualcomm | Yes |  |
| Intel | No | See our response in Q 2.2.4, we prefer to follow RAN4 conclusion, i.e. fix value. |
| Xiaomi | No | Agree with RAN4. |
| Huawei, HiSilicon | Yes | This is the parameter will not be fixed by RAN4 spec, but suffers the same issue from 1RX UE. |
| Samsung | No | Agree with the issue. However, it depends on Q 2.2.4. We think fixed offset is defined by RAN4, then Qrxlevmin and Qqualmin used by 1 RX RedCap UE can be calculated by the fixed offset (i.e., not configurable) |
| OPPO | No | Perfer to follow RAN4. |
| Sequans | Maybe | The issue exists, so some solution is needed, but it is unclear why a flexible value is needed here. |
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**Summary – Q 2.2.5**

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Based on the observations above, the rapporteur proposes the following:

1. ???

# 3 Conclusion

Based on the discussion above rapporteur suggests a discussion on the following proposals:

[Proposal 1 ???](#_Toc103572479)

[Proposal 2 ???](#_Toc103572480)

[Proposal 3 ???](#_Toc103572481)

[Proposal 4 ???](#_Toc103572482)

[Proposal 5 ???](#_Toc103572483)

[Proposal 6 ???](#_Toc103572484)

[Proposal 7 ???](#_Toc103572485)

[Proposal 8 ???](#_Toc103572486)

[Proposal 9 ???](#_Toc103572487)

[Proposal 10 ???](#_Toc103572488)

[Proposal 11 ???](#_Toc103572489)

[Proposal 12 ???](#_Toc103572490)

[Proposal 13 ???](#_Toc103572491)

[Proposal 14 ???](#_Toc103572492)

[Proposal 15 ???](#_Toc103572493)

[Proposal 16 ???](#_Toc103572494)

[Proposal 17 ???](#_Toc103572495)

[Proposal 18 ???](#_Toc103572496)

# References

1. [R2-2206021](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2206021.zip) Miscellaneous corrections for RedCap WI Ericsson CR Rel-17 38.331
2. [R2-2206022](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2206022.zip) RedCap WI ASN1 RIL list Ericsson discussion Rel-17
3. [R2-2204725](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2204725.zip) [O374] correction on RedCap UE’s cell barring OPPO draftCR 38.331
4. [R2-2204736](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2204736.zip) [O372] Discussion on prohibit timer for UAI for RRM relaxation fulfilment indication OPPO
5. [R2-2204737](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2204737.zip) [O377] Correction to 38.331 on UAI for RRM relaxation fulfilment indication OPPO
6. [R2-2204813](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2204813.zip) [V166] Including RedCap Capability in the UERadioPagingInformation Inter-Node Message vivo, Guangdong Genius
7. [R2-2204814](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2204814.zip) [V170] Discussion on Inter-RAT Mobility from LTE to NR for RedCap vivo, Guangdong Genius
8. [R2-2204929](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2204929.zip) RRC open issues on Rel17 RedCap WI Intel Corporation
9. [R2-2206059](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2206059.zip) [X115]38.331 Corrections on UE's behaviour of getting SIB1 for Redcap Xiaomi Communications
10. [R2-2206060](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2206060.zip) [X119][X114] Discussion on PDCCH-ConfigCommon for Redcap Xiaomi Communications
11. [R2-2206061](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2206061.zip) [X119][X114] 38.331 Corrections on PDCCH-ConfigCommon for Redcap Xiaomi Communications
12. [R2-2206062](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2206062.zip) [X120] 38.331 Corrections on Need code of RedCap-specific initial DL BWP for handover Xiaomi Communications
13. [R2-2204541](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2204541.zip) [S953] SI Request for RedCap UEs Samsung Electronics Co., Ltd
14. [R2-2204936](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2204936.zip) I051 support of RedCap based on intraFreqReselectionRedCap Intel Corporation
15. [R2-2204979](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2204979.zip) Cell reselection priority for RedCap (RIL#: S952) Samsung

1. [R2-2205523](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2205523.zip) SIB validity with eDRX MediaTek Inc.
2. [R2-2205783](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2205783.zip) Miscellaneous RedCap corrections Nokia, Nokia Shanghai Bell CR 38.331
3. [R2-2205785](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2205785.zip) HD-FDD RedCap support in system information Nokia, Nokia Shanghai Bell
4. [R2-2206080](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2206080.zip) [H507] Corrections on cell re-selection measurements during RRC setup/resume Huawei, HiSilicon
5. [R2-2206081](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2206081.zip) [H511] Corrections on redcapAccessRejected Huawei, HiSilicon CR 38.331
6. [R2-2206082](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2206082.zip) [H513 H516 H520 H524 H525 H526 H527] Corrections on RedCap initial BWP Huawei, HiSilicon

1. [R2-2204819](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2204819.zip) UE Capability and System Information for eDRX vivo, Guangdong Genius