3GPP TSG-RAN WG2 #119-e Tdoc R2-220XXXX

Electronic meeting, 9th - 20th May 2022

Agenda Item: 6.12.2.2

Source: Ericsson (Rapporteur)

Title: Report from [AT119-e][116][RedCap] Idle mode CR (Ericsson)

Document for: Discussion, Decision

# 1 Introduction

This is the report from the offline discussion below:

* [AT119-e][116][RedCap] Idle mode CR (Ericsson)

Scope: Draft 38.304 CR, taking into account the relevant agreement from offline 115

Intended outcome: Agreeable 38.304 CR

Deadline (for companies' feedback): Thursday 2022-08-25 1000 UTC

Deadline (for 38.304 CR in R2-2208773): Friday 2022-08-25 1000 UTC

Companies should consider the following Tdocs and the discussions therein in mind when providing feedback to the offline discussion:

[R2-2207007](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_119-e/Docs/R2-2207007.zip) Correction to description of first-PDCCH-MonitoringOccasionOfPO Samsung Electronics Co., Ltd draftCR Rel-17 38.304 17.1.0 NR\_redcap-Core

[R2-2207207](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_119-e/Docs/R2-2207207.zip) 38.304 Correction on the e-DRX for Redcap Xiaomi Communications draftCR Rel-17 38.304 17.1.0 NR\_redcap-Core

[R2-2207622](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_119-e/Docs/R2-2207622.zip) Corrections on the intra-FreqReselection and eDRX supporting for RedCap Huawei, HiSilicon CR Rel-17 38.304 17.1.0 0265 - F NR\_redcap-Core

[R2-2207750](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_119-e/Docs/R2-2207750.zip) Discussion on cellBar for RedCap vivo, Guangdong Genius discussion Rel-17 NR\_redcap-Core

[R2-2208112](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_119-e/Docs/R2-2208112.zip) Miscellaneous correction on eDRX ZTE Corporation, Sanechips CR Rel-17 38.304 17.1.0 0271 - F NR\_redcap-Core

[R2-2208221](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_119-e/Docs/R2-2208221.zip) Correction on eDRX-Allowed indication Nokia, Nokia Shanghai Bell CR Rel-17 38.304 17.1.0 0274 - F NR\_redcap-Core

In this document, we discuss the remaining idle mode corrections based on the Tdocs provided above with the intention to formulate a list of proposals that are agreeable and a list of proposals that require further discussion during the next online session.

# Contact Information

Please fill in the following table for contact information:

|  |  |
| --- | --- |
| Company | Contact person - email@address.com |
| Ericsson | Emre A. Yavuz – emre.yavuz@ericsson.com |
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# 2 Discussion on idle mode corrections

**Q 2.1** Do you agree with the intention of changes in R2-2207007? Please elaborate your reply, especially if you do not and comment below if you have any suggestions for the wording if you do.

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Futurewei | Yes | We are OK with the intention. |
| Qualcomm | Yes | It is probably a ‘D’ CR than a ‘F’ CR |
| Samsung | Yes (Proponent) |  |
| MediaTek | Needs clarification from proponent | The change indicates that ‘parameter *first-PDCCH-MonitoringOccasionOfPO* is signalled in *SIB1* for paging in *initialDownlinkBWP*’, and for other BWPs, it’s part of the BWP configuration.This can be misread as SIB1 cannot be used to signal *first-PDCCH-MonitoringOccasionOfPO* in *initialDownlinkBWP-RedCap*. Could the proponent please clarify if this is the intention (i.e. to exclude paging configuration in RedCap-specific initial DL BWP)? |
| Huawei, HiSilicon | No | If the RedCap specific BWP contains CD-SSB, it is still possible to receive paging. We would prefer to leave it is. |
| vivo | Yes, agree with the intention | The field *initialDownlinkBWP* is used to indicate the configuration of initial downlink BWP rather than the initial downlink BWP. Hence, it is a little strange to say paging in *initialDownlinkBWP.*Hence, the following alternative is proposed:The parameter *first-PDCCH-MonitoringOccasionOfPO* is signalled in *SIB1* for paging in the BWP configured by *initialDownlinkBWP*.For paging in a DL BWP other than the BWP configured by *initialDownlinkBWP*, the parameter *first-PDCCH-MonitoringOccasionOfPO* is signaled in the corresponding BWP configuration. |
| Ericsson | Yes |  |
| ZTE | Yes |  |
| Nokia | Yes |  |
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**Summary – Q 2.1**

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

1. ???

**Q 2.2** Do you agree with the intention of changes in R2-2207207? Please elaborate your reply, especially if you do not and comment below if you have any suggestions for the wording if you do.

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| **Company** | **Yes/No** | **Comments** |
| Futurewei | No | The “if” here describes among which UE specific DRX value(s) should the shortest be determined. One should follow 38.331 regarding whether any of them is mandatory or optional for RRC\_INACTIVE. Besides, the “if” applies to “RRC and/or upper layers”. So, technically the current text is still OK. We don’t see a problem here.  |
| Qualcomm | No | The current text is correct, because the “if” applies to “RRC and/or upper layers”. No change is needed |
| Samsung |  | In our understanding, UE specific DRX value configured by RRC (i.e., RAN paging cycle) is mandatory to “UE in RRC\_INACTIVE”. So, 1st change which applies to both RRC\_IDLE and RRC\_INACTIVE UEs seems not correct. Fine to either 2nd change or current text |
| MediaTek | No | There’s no possibility for misinterpretation. IE *ran-PagingCycle* is mandatory in the *SuspendConfig*, so a UE in Inactive mode will always have a value configured by RAN. Therefore, it is clear that the ‘if’ only applies to ‘upper layers’. Implementers are expected to read all specifications that affect a feature. |
| Huawei, HiSilicon | No | The change is not needed. |
| vivo | No | We prefer to keep the current wording, because:For one RRC\_IDLE UE, there is no UE specific DRX value(s) configured by RRC. Hence, the first change, which applies to both idle and inactive UEs, is not correct.For the second change, which applies to only Inactive UEs, it is technically correct. But we think this wording improvement is not essential. |
| Ericsson | No | The changes do not seem to be essential considering the signalling aspects. Note that for idle mode RRC may also refer to broadcast information, so the change is not technically correct. |
| ZTE | No | At least the first change is not needed because it applies to both RRC\_IDLE and RRC\_INACTIVE state. The second change applies to RRC\_INACTIVE state only so the change is fine for us, but we can follow the majority. |
| Nokia | No | The current text seems correct |
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**Summary – Q 2.2**

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

1. ???

**Q 2.3** Do you agree with the intention of changes in R2-2207622? Please elaborate your reply, especially if you do not and comment below if you have any suggestions for the wording if you do.

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| **Company** | **Yes/No** | **Comments** |
| Futurewei | See comments | For the first change, in 38.331, 5.2.2.5, we have:2> else if the UE is unable to acquire the *SIB1*:3> consider the cell as barred in accordance with TS 38.304 [20];3> if the UE is a RedCap UE:4> peform barring as if *intraFreqReselectionRedCap* is set to allowed;Therefore, the RedCap UE will pass the following three ifs in 38.304 and end up executing the two mays:When cell status "barred" is indicated or to be treated as if the cell status is "barred",…- If the UE is not a RedCap UE, or if the UE is a RedCap UE and *intraFreqReselectionRedCap* in SIB1 is available:- If the field *intraFreqReselection* in *MIB* message is set to "allowed":- the UE may select another cell on the same frequency if re-selection criteria are fulfilled;- If the cell is to be treated as if the cell status is "barred" due to being unable to acquire the *SIB1*:- the UE may exclude the barred cell as a candidate for cell selection/reselection for up to 300 seconds;We sympathize with Huawei in that one has to look at both 38.331 and 38.304 to figure the UE’s behavior. We don’t mind adding some text in 38.304, such as for the same “if” proposed by Huawei, the UE considers the cell as “barred” and *intraFreqReselectionRedCap* as if set to allowed. Then, the current text takes care of the rest. And we think it is reasonable to use “may”, instead of “shall”, for “exclude … for up to 300 seconds” because the UE may try to acquire the next SIB1 and actually succeed. No strong view for the second change. Can go with the majority.On the third change, we may need to wait for (or jointly consider with) P1 and P2 of e-mail discussion [115], i.e., changing the description of *eDRX-AllowedIdle* and *eDRX-AllowedInactive*. |
| Qualcomm | See comment | We have the same comment has FutureWei |
| Samsung |  | On 1st change, agree with Futurewei but have concern if we clarify 38.331 procedure in 38.304 again, it may lead to big correction.On 2nd change, agree with proposed changeOn 3rd change, we propose:The UE may operate in eDRX only if the UE is configured by RRC and/or upper layers and *eDRX-AllowedInactive* and/or *eDRX-AllowedIdle* is signalled in SIB1 |
| MediaTek | - | Similar views as FutureWei, i.e.1st change: reasonable to use may2nd change: No strong view3rd change: Update based on discussion [115] |
| Huawei, HiSilicon | Yes (proponent) | On 1st change: RAN2 agreed that RedCap UE applies the cellbared in MIB. It means the UE behavior should also be same as the one in legacy, in case cell is barred due to MIB indicating barred, rather than the case due to SIB1 not available.We understand “shall” should be used, since it reuses the same logic of the legacy case “*barred* is indicated in MIB and *intraFreqReselection* in MIB is set to *allowed*”. So the similar UE behavior (yellow-highlighted below) should be adopted.- If the UE is not a RedCap UE, or if the UE is a RedCap UE and *intraFreqReselectionRedCap* in SIB1 is available:- If the field *intraFreqReselection* in *MIB* message is set to "allowed":- the UE may select another cell on the same frequency if re-selection criteria are fulfilled;- If the cell is to be treated as if the cell status is "barred" due to being unable to acquire the *SIB1*:- the UE may exclude the barred cell as a candidate for cell selection/reselection for up to 300 seconds;- else:- the UE shall exclude the barred cell as a candidate for cell selection/reselection for 300 seconds. |
| vivo | No for the first changeYes for the second and third change. | For the first change, the added description is already covered by the following section which starts with “If the cell is to be treated as if the cell status is "barred" due to being unable to acquire the SIB1:”. Hence, this change creates redundancy.For the second and third change, we agree the current wording in specification is not clear, and prefer to improve it.In Rel-17, RAN eDRX can never be applied without CN eDRX. Hence, UE needs not the check whether RAN eDRX is applied when it selects the UE\_ID for PF and PO determination. Hence, the suggested wording for the second change from our side is:UE\_ID:If an eDRX cycle is configured by upper layers and *eDRX-AllowedIdle* is signalled in SIB1:- 5G-S-TMSI mod 4096else:- 5G-S-TMSI mod 1024Given the same reason, the suggested wording for the third change from our side is:The UE may operate in eDRX only if the UE is configured by upper layers and *eDRX-AllowedIdle* is signalled in SIB1 in the cell.The UE may operate in eDRX only if the UE is configured by upper layers and *eDRX-AllowedIdle* is signalled in SIB1 in the cell. |
| Ericsson | See the comments | No strong view for the first change, but if adopted we agree with Huawei that “shall“ should be used.For the second change we propose the following: “If eDRX cycle is configured by RRC or upper layers and eDRX-AllowedIdle and/or eDRX-AllowedInactive is signalled in SIB1.“The third change is not needed, the current text is clear. If it were to be clarified, we propose the following: “The UE may operate in eDRX only if the UE is configured by RRC or upper layers and the cell indicates support for eDRX in idle and/or inactive in System Information“ |
| ZTE | See comments | For the first change: We think the change is already covered by following text in current spec:When cell status "barred" is indicated for RedCap UEs with 1Rx/2Rx or to be treated as if the cell status is "barred",- The UE is not permitted to select/reselect this cell, not even for emergency calls.- The UE shall select another cell according to the following rule:- If the cell is to be treated as if the cell status is "barred" due to being unable to acquire the *SIB1*:- the UE may exclude the barred cell as a candidate for cell selection/reselection for up to 300 seconds.- the UE may select another cell on the same frequency if the selection criteria are fulfilled.For the second and third change: Agree with intention. But we are fine to wait for outcome of email discussion [115], e.g. on the IE name of eDRX-AllowedIdle and eDRX-AllowedInactive. |
| Nokia | See the comments | yes for the 2nd and 3rd change. Agree with Samsung |
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**Summary – Q 2.3**

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

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**Q 2.4** Do you agree with the intention of changes in R2-2207750? Please elaborate your reply, especially if you do not and comment below if you have any suggestions for the wording if you do.

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| **Company** | **Yes/No** | **Comments** |
| Futurewei | See comments | Agree with the intention. There may be more redundancy that can be removed, as follows:First, within Part 2, case 2-1 and case 3-1 are already covered by the first two ifs within case 2-3 and case 3-3 in Part 1, based on the same 38.331 text and reasoning that we have provided in Q2.3. (We consider “as if *intraFreqReselectionRedCap* is set to allowed;” in 38.331 means “as if *intraFreqReselectionRedCap* is available and set to allowed”.) Secondly, within Part 2, <When cell status "barred" is indicated for RedCap UEs with 1Rx/2Rx> is already covered by Part 1, because <When cell status "barred" is indicated> in Part 1 includes both cases of indicated by MIB barring indicator and indicated by 1Rx/2RX barring indicator. And since the 1Rx/2RX barring indicator is present, the IFRI-RedCap must be present as well.So, what remains in Part 2 is only case 2-2 and case 3-2, as follows:When the UE is a RedCap UE and the cell is to be treated as if the cell status is "barred" due to not supporting RedCap UEs,- The UE shall select another cell according to the following rule:- the UE shall exclude the barred cell as a candidate for cell selection/reselection for 300 seconds.- the UE may select another cell on the same frequency if re-selection criteria are fulfilled.…With that, we think it is better to remove Part 2 (i.e., the second “When …” paragraph) completely and add case 2-2 and case 3-2 into Part 1 as follows:….When cell status "barred" is indicated or to be treated as if the cell status is "barred",- The UE is not permitted to select/reselect this cell, not even for emergency calls.- The UE shall select another cell according to the following rule:- If the UE is a RedCap UE and the cell is to be treated as if the cell status is "barred" due to not supporting RedCap UEs:- the UE shall exclude the barred cell as a candidate for cell selection/reselection for 300 seconds.- the UE may select another cell on the same frequency if re-selection criteria are fulfilled.- elseif the cell is to be treated as if the cell status is "barred" due to being unable to acquire the *MIB*:- the UE may exclude the barred cell as a candidate for cell selection/reselection for up to 300 seconds.- the UE may select another cell on the same frequency if the selection criteria are fulfilled.- else:… |
| Qualcomm | Yes |  |
| Samsung | Yes | We support proposals in the contribution and also agree with Futurewei’s update. Given they have a lot of changes, so may need another offline for CR review, if RAN2 agrees to pursue these.  |
| MediaTek | Yes | We can discuss the actual update in detail once the CR is available |
| Huawei, HiSilicon | See comments | The first paragraph is for both RedCap UE and non-RedCap UE, on the case of barred due to “barred setting in MIB“.We can try to clarify “When cell status "barred" is indicated by MIB or to be treated as if the cell status is "barred",” |
| vivo | Yes, proponent | There is redundancy in current description. We suggest to remove the redundancy to simplify the specification. |
| Ericsson | No | There seems to be nothing broken and the proposed changes are editorial optimizations. Therefore we do not think that the changes are essential. |
| ZTE | Yes |  |
| Nokia | Yes | Agree with the intention |
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**Summary – Q 2.4**

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

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**Q 2.5** Do you agree with the intention of changes in R2-2208112? Please elaborate your reply, especially if you do not and comment below if you have any suggestions for the wording if you do.

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| **Company** | **Yes/No** | **Comments** |
| Futurewei | Postpone? | We may need to wait for (or jointly consider with) P1 and P2 of e-mail discussion [115], i.e., changing the description of *eDRX-AllowedIdle* and *eDRX-AllowedInactive*. |
| Qualcomm | See comment | 1st change is already addressed by discussion in #1152nd change is not neededWe are fine with the 3rd change |
| Samsung |  | Agree with Futurewei |
| MediaTek | See comments | 1st change: Update based on [115]2nd and 3rd change: Ok to include |
| Huawei, HiSilicon | See comments | 1st change, OK to wait for [115], but the intention is reasonable.2nd change: no strong view3rd chagne: we need to first clarfify whether gNB supporting eDRX has to support inactiveStatePO-Determination at gNB side. If that is the case, the change is fine. |
| vivo | Yes for the first change in section 7.1No for the second change in section 7.1No for the third change in section 7.2.1 | For the first change in section 7.1, see our suggestion in Q2.3For the second change in section 7.1, we see no reason to change the UE behavior of RAN paging monitoring to align the PO for RAN paging and CN paging occasions outside CN PTW, since CN paging monitoring is not performed outside CN PTW. The modification is not essential.According to the conclusion below, the original text has cover the eDRX scenario, there is no need to clarify further. *inactiveStatePO-Determination-r17 introduced in R2-2111586 covers eDRX scenario, and no new UE capability is needed. A UE supports eDRX shall also support inactiveStatePO-Determination-r17.*Besides*,* the change isn’t right at the following scenario:eDRX is configured by upper layers and *eDRX-AllowedInactive* is signaled in SIB1, however, the network doesn’t broadcast *ranPagingInIdlePO* with value "true". In the above case, we think the network won’t use the enhancement to solve the PO issue. However, if we changed as R2-2208112, it assumes network will use the same i\_po in RRC\_IDLE and RRC\_INACTIVE, which is not correct in our understanding.  |
| Ericsson | See the comments | Agree with the intention of the first change, but there is already an ongoing discussion in offline#115, so there is no need to pursue this aspect in this discussion.We do not agree with the second change since it does seem to be reflecting the exiting behaviour. If the intention is to change the current behavioyr, e.g., align it with LTE, further discussion is required.We do not agree with the third change either since it seems the proposal is to change the current behaviour which requires further discussion. |
| ZTE | See comment | Proponent.For the first change: it is fine to wait for outcome of email discussion [115] on the IE name of *eDRX-AllowedIdle and eDRX-AllowedInactive*. For the second change: The intention is to align the UE behavior in NR eDRX with LTE eDRX. The second change is irrelevant to the outcome of discussion [115]. |
| Nokia | Yes | Agree with the intention |
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**Summary – Q 2.5**

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

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**Q 2.6** Do you agree with the intention of changes in R2-2208221? Please elaborate your reply, especially if you do not and comment below if you have any suggestions for the wording if you do.

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| **Company** | **Yes/No** | **Comments** |
| Futurewei | Postpone? | We may need to wait for (or jointly consider with) P1 and P2 of e-mail discussion [115], i.e., changing the description of *eDRX-AllowedIdle* and *eDRX-AllowedInactive*. |
| Qualcomm | - | This issue is already addressed in #115 |
| Samsung |  | Agree with Futurewei |
| MediaTek | - | Address this based on [115] |
| Huawei, HiSilicon |  | OK to wait for [115] |
| vivo | Yes | Please see our suggestion in Q2.3 |
| Ericsson | See the comments | Agree with the intention but this issue is already discussed at the moment and we have proposed a simplified text in one of the questions above. |
| ZTE | No | The change excludes the following case: UE in RRC\_INACTIVE state, but only *eDRX-AllowedIdle* is indicated. In this case, the UE should follow eDRX configured by upper layer for CN paging. |
| Nokia | Yes | Proponent.  |
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**Summary – Q 2.6**

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

1. ???

# 3 Conclusion

Based on the discussion above rapporteur suggests the following proposals:

[Proposal 1 ???](#_Toc112239661)

[Proposal 2 ???](#_Toc112239662)

[Proposal 3 ???](#_Toc112239663)

[Proposal 4 ???](#_Toc112239664)

[Proposal 5 ???](#_Toc112239665)

[Proposal 6 ???](#_Toc112239666)

# References

1. [R2-2207007](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_119-e/Docs/R2-2207007.zip) Correction to description of first-PDCCH-MonitoringOccasionOfPO Samsung Electronics Co., Ltd draftCR Rel-17 38.304 17.1.0 NR\_redcap-Core
2. [R2-2207207](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_119-e/Docs/R2-2207207.zip) 38.304 Correction on the e-DRX for Redcap Xiaomi Communications draftCR Rel-17 38.304 17.1.0 NR\_redcap-Core
3. [R2-2207622](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_119-e/Docs/R2-2207622.zip) Corrections on the intra-FreqReselection and eDRX supporting for RedCap Huawei, HiSilicon CR Rel-17 38.304 17.1.0 0265 - F NR\_redcap-Core
4. [R2-2207750](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_119-e/Docs/R2-2207750.zip) Discussion on cellBar for RedCap vivo, Guangdong Genius discussion Rel-17 NR\_redcap-Core
5. [R2-2208112](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_119-e/Docs/R2-2208112.zip) Miscellaneous correction on eDRX ZTE Corporation, Sanechips CR Rel-17 38.304 17.1.0 0271 - F NR\_redcap-Core
6. [R2-2208221](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_119-e/Docs/R2-2208221.zip) Correction on eDRX-Allowed indication Nokia, Nokia Shanghai Bell CR Rel-17 38.304 17.1.0 0274 - F NR\_redcap-Core