**3GPP TSG-RAN WG2 Meeting #118-e R2-220xxxx**

**Online, 9th-20th May 2022**

**Agenda item: 6.12.2.2.2**

**Source: Samsung**

**Title: Report of [AT118-e][115][RedCap] 38.304 CR (Samsung) (Phase 2)**

**Document for: Discussion and decision**

1. Introduction

This document is to report the outcome of the following email discussion (Phase 2) at RAN2#118e meeting:

* [AT118-e][115][RedCap] 38.304 CR (Samsung)

Initial scope: Discuss 1. eDRX corrections for 38.304 (considering the latest 38.304 version in [R2-2206023](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2206023%20-%20Miscellaneous%20corrections%20for%20RedCap%20WI%20-%20TS%2038.304.docx)), e.g. based on [R2-2205090](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2205090.docx), and 2. cell barring corrections, based on [R2-2205613](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2205613_38.304%20%20Corrections%20on%20Redcap%20UE%27s%20behavior%20on%20cellbar.docx)

Initial intended outcome: Summary of the offline discussion with agreeable proposals/TP for 38.304

Deadline (for companies' feedback): Tuesday 2022-05-17 22:00 UTC

Deadline (for rapporteur's summary in [R2-2206213](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2206213.zip)): Tuesday 2022-05-17 23:00 UTC

Final scope: continue the discussion on p1, p4 and p5 from [R2-2206213](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2206213.zip) and update the 38.304 CR, also reflecting other meeting agreements

Intended outcome: Agreeable 38.304 CR

Deadline (for companies' feedback): Friday 2022-05-20 08:00 UTC

Deadline (for final CR in R2-2206216): Friday 2022-05-20 10:00 UTC

(Deadlines for CR are indicative. It’s likely that this discussion will move to a Post118-e discussion)

2. Contact Information

|  |  |
| --- | --- |
| Company | Contact: Name (E-mail) |
| Futurewei | Yunsong Yang (yyang1@futurewei.com) |
| Huawei, HiSilicon | Yulong (shiyulong5@huawei.com) |
| Intel | Marta (marta.m.tarradell@intel.com) |
| vivo | Chenli (Chenli5g@vivo.com) |
| OPPO | Haitao Li (lihaitao@oppo.com) |
| LGE | Soo Kim (soo.kim@lge.com) |
| Samsung | Seungbeom (s90.jeong@samsung.com) |
| NEC | Hisashi Futaki (hisashi.futaki@ nec.com), Wang Da (wang\_da @nec.cn) |
| Xiaomi | Yanhua Li (liyanhua1@xiaomi.com) |
| Sequans | Noam Cayron (noam.cayron@sequans.com) |
| MediaTek | Pradeep Jose (pradeep dot jose at mediatek dot com) |
| ZTE | LiuJing (liu.jing30@zte.com.cn) |
| Ericsson | emre dot yavuz dot ericsson dot com |
|  |  |

3. Discussion (1st round)

Note that all the corrections to be discussed in this document are based the latest 38.304 version (i.e., R2-2206023) [1]. Based on [1], rapporteur would like to discuss proposed corrections on [2], [3], [4], [5], [6], and [7].

## 3.1 Corrections on eDRX

For corrections in clause 7.1 in TS 38.304, companies proposed corrections in [2], [3], [4], [5], and [6]. Rapporteur understands [2] includes all corrections proposed in [3], [4], [5], and [6]. Therefore, [2] is taken as baseline of the following discussion, and companies are allowed to propose any further update in section 3.3.

As the first proposal in [2], the proponent mentions:

*In clause 7.1, when T (i.e., DRX cycle of the UE) is determined, the indication from NW (i.e., eDRX-allowed in SIB1) is not considered. Therefore, it is proposed in clause 7.1, the condition (i.e., if eDRX-allowed is not signalled in SIB1) is added to determine T.*

Rather than capturing [2] as it is, rapporteur updates the first proposal in [2] on the top of the latest 38.304 [1], as follows:

|  |
| --- |
| Proposed TP1:*<Other TP is skipped>*The following parameters are used for the calculation of PF and i\_s above:T: DRX cycle of the UE.If *eDRX-Allowed* is not signalled in SIB1 or eDRX is not configured as defined in clause 7.4:- T is determined by the shortest of the UE specific DRX value(s), if configured by RRC and/or upper layers, and a default DRX value broadcast in system information. In RRC\_IDLE state, if UE specific DRX is not configured by upper layers, the default value is applied.In RRC\_IDLE state, if *eDRX-Allowed* is signalled in SIB1 and eDRX is configured by upper layers, i.e., TeDRX, CN, according to clause 7.4:- If TeDRX, CN is no longer than 1024 radio frames:- T = TeDRX, CN;- else:- During CN configured PTW, T is determined by the shortest of UE specific DRX value, if configured by upper layers, and the default DRX value broadcast in system information.In RRC\_INACTIVE state, if *eDRX-Allowed* is signalled in SIB1 and eDRX is configured by RRC, i.e., TeDRX, RAN , and/or upper layers, i.e., TeDRX, CN, as defined in clause 7.4:- If both TeDRX, CN and TeDRX, RAN are no longer than 1024 radio frames, T = min{TeDRX, RAN, TeDRX, CN}.- If TeDRX, CN is no longer than 1024 radio frames and no TeDRX, RAN is configured, T = min{DRX value configured by RRC, TeDRX, CN}.*<Other TP is skipped>* |

**Q1:** Do you support the proposed TP1 captured above? When you answer, you may refer each update as "Update 1-x"

|  |  |  |
| --- | --- | --- |
| Company | Yes or No | Comments |
| Futurewei | Yes in principle, but  | but if RAN2 agree on introducing separate Allowed bits, we need further revision accordingly. |
| Huawei, HiSlicon | See comment | The intention is technically correct, but.To avoid the complexity (considering the possible two bits in SBI1), we think the current specification already has the statement as below, which should be sufficient, as in LTE.“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 System Information”.Fine to go with majority to come back to this after conclusion of SIB1 indicaitons. |
| Intel | Yes |  |
| vivo | Yes with comments | Agree with the intention, but depending on the conclusion on new indication in SIB1.  |
| OPPO | Yes with comment | Since we have agreed to introduce separate eDRX-allowed bits, we need to further revise the wording. |
| LGE | See comment | Agree with Huawei |
| Samsung | Yes | Agree, and update for separate bits is being discussed in Q2.  |
| NEC | Yes |  |
| Xiaomi | Yes |  |
| Sequans | See comment | Agree with HW |
| MediaTek | See comment | This text can be polished based on the agreement on separate bits |
| ZTE | See comment | If there is only one indication in SIB1, we think the general description as indicated by Huawei is enough. |
| Ericsson | See comment | Agree with HW; if agreed as proposed in this document the outcome of the related discussion should be considered. |

**Summary**: Given update for separate bits is being discussed in Q2, rapporteur understands 8 companies out of 13 companies support proposed TP1. 5 companies understand the intention of this proposal, but they think current specification already has the statement (i.e.,“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 System Information”.), which should be sufficient, as in LTE. However, as 1) majority view supports the proposed TP1 and 2) this clarifies determination of T according to whether eDRX-allowed is present or absent in SIB1, rapporteur proposes to adopt proposed TP1.

**Proposal 1. (8/13) (To discuss) Adopt proposed TP1 in R2-2206213 as baseline. This can be updated based on result of offline [110] (i.e., whether to introduce separate bits in SIB1).**

Besides, in rapporteur's understanding, if TP1 is agreed, TP1 may be updated further according to the result of [AT118-e][110][RedCap] UE capabilities (Intel). That is because, in the 2nd round of that offline discussion, a proposal (i.e., *Introduce separate bits in SIB1 to indicate whether IDLE eDRX and/or INACTIVE eDRX are enabled. The INACTIVE eDRX may be enabled only if IDLE eDRX is enabled.*) is being discussed.

**Q2:** Do you agree, if the proposed TP1 is agreed, further update may be needed according to the decision on whether to introduce separate bits in SIB1 for inactive eDRX?

|  |  |  |
| --- | --- | --- |
| Company | Yes or No | Comments |
| Futurewei | Yes | As commented in Q1. |
| Huawei, HiSilicon | See comments | General description as our comments in Q1 is sufficient.That’s also our concern on 2 bits in SIB1, which cause more procedure update. |
| Intel | Yes |  |
| vivo | Yes |  |
| OPPO | Yes |  |
| LGE | Yes | If TP1 is agreed, further updates are required for each RRC state (idle/inactive). |
| Samsung | Yes |  |
| NEC | Yes |  |
| Xiaomi | Yes |  |
| Sequans | See comments | Agree with HW |
| MediaTek | Comment | Best to fix the text based on the final agreement on this. |
| ZTE | Yes | If separate bits are introduced, then update is needed. |
| Ericsson | Yes | Please see our comments in Q1. |

**Summary**: 10 companies support, if proposed TP1 is agreed, further update may be needed according to the decision on whether to introduce separate bits in SIB1 for inactive eDRX. 2 companies have concern on 2 bits in SIB1 causing more procedure update. One company mentioned further updates are required for each RRC state, and another company mentioned it would be best to fix the text based on the final agreement on this. Rapporteur would like to discuss Q1 and Q2 together, so they are combined as Proposal 1 above.

As the second proposal in [2], the proponent mentions:

*Determination of T used by UEs in RRC\_INACTIVE is wrong. The following RAN2 agreements should be specified accurately.*

*- For RRC\_INACTIVE UE, when IDLE eDRX cycle is longer than 10.24s and Inactive eDRX cycle is not configured, during CN PTW, T is determined by the shortest of UE specific DRX cycle, if configured by upper layer, RAN paging cycle and default paging cycle.*

*- For RRC\_INACTIVE UE, when IDLE eDRX cycle is longer than 10.24s and Inactive eDRX cycle is no longer than 10.24s, outside CN PTW, T is determined by INACTIVE eDRX cycle.*

*- For RRC\_INACTIVE UE, when IDLE eDRX cycle is no longer than 10.24s and INACTIVE eDRX cycle is no longer than 10.24s, T is determined by the shortest of IDLE eDRX cycle and INACTIVE eDRX cycle.*

*- For RRC\_INACTIVE UE, when IDLE eDRX cycle is longer than 10.24s and INACTIVE eDRX cycle is no longer than 10.24s, during CN PTW, T is determined by the shortest of UE specific DRX cycle, if configured by upper layer, INACTIVE eDRX cycle and default paging cycle.*

*- For RRC\_INACTIVE UE, when IDLE eDRX cycle is no longer than 10.24s and INACTIVE eDRX cycle is not configured, T is determined by the shortest of RAN paging cycle and IDLE eDRX cycle.*

*- For RRC\_INACTIVE UE, when IDLE eDRX cycle is longer than 10.24s and INACTIVE eDRX cycle is not configured, outside CN PTW, T is determined by RAN paging cycle.*

Rather than capturing [2] as it is, rapporteur updates the second proposal in [2] on the top of the latest 38.304 [1], as follows:

|  |
| --- |
| Proposed TP2:*<Other TP is skipped>*In RRC\_INACTIVE state, if eDRX is configured by RRC, i.e., TeDRX, RAN, and/or upper layers, i.e., TeDRX, CN, as defined in clause 7.4:- If both TeDRX, CN and TeDRX, RAN are no longer than 1024 radio frames, T = min{TeDRX, RAN, TeDRX, CN}.- If TeDRX, CN is no longer than 1024 radio frames and no TeDRX, RAN is configured, T is determined by the shortest of UE specific DRX value configured by RRC, and TeDRX, CN.- If TeDRX, CN is longer than 1024 radio frames:- If TeDRX, RAN is not configured:- During CN configured PTW, T is determined by the shortest of the UE specific DRX value (s), if configured by RRC and/or upper layers, and a default DRX value broadcast in system information. Outside the CN configured PTW, T is determined by the UE specific DRX value configured by RRC;- else if TeDRX, RAN is no longer than 1024 radio frames:- During CN configured PTW, T is determined by the shortest of the UE specific DRX value, if configured by upper layers, and TeDRX, RAN, and a default DRX value broadcast in system information. Outside the CN configured PTW, T is determined by TeDRX, RAN.*<Other TP is skipped>* |

In rapporteur's understanding, update 2-1 clarifies "UE specific" DRX value configured by RRC, and update 2-4 seems valid since the branch (i.e., else if TeDRX, RAN is no longer than 1024 radio frames: ) already indicates TeDRX, RAN is configured. Other updates can be understood simply.

**Q3-1**: Do you support the proposed TP2 captured above? When you answer, you may refer each update as "Update 2-x".

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| Futurewei | Yes |  |
| Huawei, HiSilicoin | Yes |  |
| Intel | Yes |  |
| vivo | Yes |  |
| OPPO | Yes |  |
| LGE | Yes |  |
| Samsung | Yes |  |
| NEC | Yes but  | TP2 is not based on the latest spec. One change is not marked:-    If TeDRX, CN is longer than 1024 radio frames:-    If TeDRX, RAN is not configured:-    During CN configured PTW, T is determined by the shortest of the UE specific DRX value (s), if configured by upper layers and/or upper layers ~~T~~~~eDRX, RAN~~ ~~and/or T~~~~eDRX, CN~~ ~~if configured~~, and a default DRX value broadcast in system information. Outside the CN configured PTW, T is determined by the UE specific DRX value configured by RRC; |
| Xiaomi | Yes | To NEC: That is for PO demermination, not for T.[NEC] Thank you. We misunderstand the agreements. Our comment is updated. |
| Sequans | Yes |  |
| MediaTek | Yes |  |
| ZTE | Yes |  |
| Ericsson | Yes |  |

**Summary**: As all companies support proposed TP2, rapporteur would like to propose to adopt TP2 on top of changes in R2-2206023.

**Proposal 2. (13/13) (To agree) Adopt proposed TP2 (for determination of T) in R2-2206213, on top of changes in R2-2206023.**

A company proposed in [3] that RAN2 discuss whether to clarify the different cases for selection of T based on eDRX cycle configured for a UE in RRC\_IDLE and RRC\_INACTIVE by using a table instead. Considering the corrections discussed in previous section, the updated table would look as follow:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **TeDRX, CN** | **TeDRX, RAN** | **T to monitor POs within** **CN configured PTW** | **T to monitor POs outside CN configured PTW** |
| UE in RRC\_IDLE | ≤ 10.24 sec. | none or any value  | TeDRX, CN  | NA |
| > 10.24 sec. | none or any value | Shortest of UE specific DRX (if configured by upper layers) and default DRX cycle (broadcasted in system information) | NA |
| UE in RRC\_INACTIVE | ≤ 10.24 sec. | none | Shortest of UE specific DRX value configured by RRC, and TeDRX, CN | NA |
| ≤ 10.24 sec. | ≤ 10.24 sec. | Shortest of TeDRX, RAN and TeDRX, CN  | NA |
| > 10.24 sec. | none | Shortest of UE specific DRX(s), TeDRX, CN and default DRX cycle (broadcasted in system information) | UE specific DRX value configured by RRC |
| > 10.24 sec. | ≤ 10.24 sec. | Shortest of UE specific DRX (if configured by upper layers), TeDRX, RAN and default DRX value (broadcasted in system information) | TeDRX, RAN |

**Q3-2**: Do you support CR [3] which proposes to capture the table above, rather than text procedure (e.g., proposed TP2)?

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| Samsung | No strong view | Fine with either proposed TP2 or the table above  |
| Intel | Yes | We are the proponents of the CR. We suggest this update as it seems clearer while containing the same information which may also avoid future confusions on the expected UE’s operation. |
| Xiaomi | No strong view | For the case:**TeDRX, CN is longer than** 10.24 and **TeDRX, RAN is** not configured:During CN configured PTW, T is determined by the shortest of the UE specific DRX value (s), if configured by RRC and/or upper layers, and a default DRX value broadcast in system information.The table says:Shortest of UE specific DRX(s), TeDRX, CN and default DRX cycle (broadcasted in system information)It should be Shortest of UE specific DRX(s) by RRC and/or upper layers and default DRX cycle (broadcasted in system information) |
| Sequans | Yes | Agree with Intel that this is clearer |
| Huawei, HiSilicon | No | It is good to add this as additional information. But, this should not replace the current procedure text. It is too late to re-check the table.Can we add this as Annex in the spec, rather than normative text? |
| MediaTek | No | Is there any new information provided by this text? If not, the current text is fine. |
| ZTE | Prefer No | We think the current procedure text is complete, so prefer not to add the table.  |
| Ericsson | No strong view, but | Considering the late stage, it may be better to keep TP2 to avoid further checks etc. We do not prefer adding an informative table, e.g., in the Annex to avoid maintenance on both text. |

**Summary**: Only 8 companies answered this question. Rapporteur understands this table is more readable and simpler. However, companies have concern that it is too late for RAN2 to re-check the table case by case. Meanwhile, a company mentioned this table can be added as annex, but another company raised maintenance issue for both text and table. Therefore, rapporteur would like to propose not to capture the table for determination of T.

**Proposal 3. (6/8) (To discuss) Not capture the table for determination of T in TS 38.304.**

## 3.2 Corrections on cell barring

In [7], a company proposes update in clause 5.3.1 in TS 38.304:

*This CR Corrects on Redcap UE's behavior on cellbar In 38.304.*

*1) First change:*

*This procedure is for the cellbar in MIB. Redcap UE shall acquire SIB1 and follow IFRI in SIB1 if available. If not, UE will skip this procedure, otherwise Redcap UE will continue to check IFRI in MIB as legacy UE which is not correct.*

*2) Second change is to remove “not supporting RedCap UEs” since in TS38.331, we have captured:*

2> if *intraFreqReselectionRedCap* is not present in *SIB1*:

3> consider the cell as barred in accordance with TS 38.304 [20];

3> perform barring as if *intraFreqReselectionRedCap* is set to allowed;

*Then UE will follow the next else branch to follow IFRI in SIB1.*

*We do not need to specify “not supporting RedCap UEs” in 304 again.*

*3) To add” being unable to acquire the SIB1” to align with RAN2#117 agreement:*

*UE should consider IFRI as “allowed” when Red Cap UE is unable to acquire SIB1.*

Corresponding TP update is captured as follows:

|  |
| --- |
| Proposed TP3:5.3.1 Cell status and cell reservationsWhen 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 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:- If the UE is a RedCap UE, the UE shall acquire SIB1 and, in the remainder of this procedure, consider '*intraFreqReselection* in MIB' to be '*intraFreqReselectionRedCap* in SIB1', if available*.* If not available, RedCap UE skips the remainder of this procedure.- 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;*<Other TP is skipped>*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.- else:- If the field *intraFreqReselectionRedCap* in *SIB1* message is set to "allowed":- 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.*<Other TP is skipped>* |

**Q4:** Do you support the proposed TP3 captured above? When you answer, you may refer each update as "Update 3-x".

|  |  |  |
| --- | --- | --- |
| Company | Yes or No | Comments |
| Futurewei | Yes with modifications | If we are to agree on the first change (i.e., removing the scenario where *intraFreqReselectionRedCap* is not available in *SIB1* from the legacy procedure), which we are OK with, we need to deal with the scenario of IFRIRedCap being unavailable in SIB1 in the RedCap-specific procedure.But with the second change, we will completely lose that scenario. We propose the following to fix it: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.- else:- If the field *intraFreqReselectionRedCap* in *SIB1* message is set to "allowed"; or- If the cell is to be treated as if the cell status is "barred" due to the field *intraFreqReselectionRedCap* being absent in *SIB1* message:- 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. |
| Huawei, HiSilicon | Yes, see comments | For the comments from Futurewei on “update 3-2”, we can just add “being unable to acquire the SIB1” rather than remove something, proposed change like below- If the cell is to be treated as if the cell status is "barred" due to not supporting RedCap UEs, or due to being unable to acquire the *SIB1*: |
| Intel | Yes with comment | We support the update explained by Huawei  |
| vivo | No with comments | For update 3-1: the intention is correct, but:It is not clear what is exactly meaning of “the remainder of this procedure” in the proposed TP. Since there are two parts in section 5.3.1，* The first part is for both redcap and non-redcap UEs.
* The second part is ONLY for redcap UEs.

In our understanding, the “remainder of this procedure” indicates UE should skip the remainder of the first part and continue with the second part.Thus, we suggest:5.3.1 Cell status and cell reservationsWhen 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 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:- If the UE is a RedCap UE, the UE shall acquire SIB1 and, in the remainder of this procedure, consider '*intraFreqReselection* in MIB' for non-RedCap UEs to be '*intraFreqReselectionRedCap* in SIB1' for RedCap UEs, if available*.* - If the field *intraFreqReselection* in *MIB* message for non-RedCap UEs 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;For update 3-2: the case that when UE could acquire but there is no RedCap specific IFRI is missed if we agreed this update. |
| OPPO | Yes with comments | For update 3-1, we agree with the intention but it is unclear what “the remainder of this procedure” refers to, maybe need to further clarify.For update 3-2, we agree with Huawei’s comments. |
| LGE | Yes with comment | Agree with Huawei |
| Samsung | Yes | Our understanding is: 1) If UE is not able to acquire SIB1, UE should bar the cell, and UE should not bar the frequency (i.e. perform barring as if intraFreqReselectionRedCap is set to allowed.). This aligns with update 3-2.2) If 'intraFreqReselectionRedCap’ in SIB1 is not present, UE should bar the cell, and UE should not bar the frequency (i.e. perform barring as if intraFreqReselectionRedCap is set to allowed, as specified in 38.331) |
| NEC | Yes with comment | For update 3-1, one small suggestion is to remove “RedCap”, i.e. “~~RedCap~~ UE skips”, just to align with other wording.For update 3-2, we are fine with Huawei’s suggestion. |
| Xiaomi | Yes | For update 3-1, Yes, the first part is for Redcap and for none-Redcap, and the second part is for Redcap only. If Redcap is bared by cellbar in MIB, then UE should go the procedure in the first part as legacy UE.If people really have concerns with Oppo, Vivo’s update is OK to us.For update 3-2, if people want to keep the removed part, we can keep it.Ok with HW’s update. |
| Sequans | Yes with comment | Agree with HW’s comments. Also OK with suggestion by vivo. |
| MediaTek | Yes with comment | For 3-1, vivo’s suggestion looks good to us.For 3-2, Huawei’s comments look good. |
| ZTE | See comments | 1. For update 3-1, there is ambiguity in “this procedure”, but for Vivo’s proposal, seems the last change cannot address the issue.
2. For update 3-2, we are fine with HW’s proposal.
 |
| Ericsson | Yes, see comments | For 3-2, we agree with HW’s comment and the corresponding proposal. |

**Summary**:

For update 3-1, there is an issue that, it is not clear what is exactly meaning of “the remainder of this procedure” in the proposed TP. So, instead of update 3-1, a company proposed the following update:

- If the UE is a RedCap UE, the UE shall acquire SIB1 and, in the remainder of this procedure, consider '*intraFreqReselection* in MIB' for non-RedCap UEs to be '*intraFreqReselectionRedCap* in SIB1' for RedCap UEs, if available*.*

- If the field *intraFreqReselection* in *MIB* message for non-RedCap UEs is set to "allowed":

4 companies supported this proposal. Besides, one company indicated the following update is also needed together.

- If the field *intraFreqReselection* in *MIB* message for non-RedCap UEs is set to "not allowed":

As a result, rapporteur would like to propose to adopt the following TP.

- If the UE is a RedCap UE, the UE shall acquire SIB1 and, in the remainder of this procedure, consider '*intraFreqReselection* in MIB' for non-RedCap UEs to be '*intraFreqReselectionRedCap* in SIB1' for RedCap UEs, if available*.*

- If the field *intraFreqReselection* in *MIB* message for non-RedCap UEs is set to "allowed":

(…)

- If the field *intraFreqReselection* in *MIB* message for non-RedCap UEs is set to "not allowed":

**Proposal 4. (4/13) (To discuss). Adopt the following TP in clause 5.3.1 in TS 38.304:**

**- If the UE is a RedCap UE, the UE shall acquire SIB1 and, in the remainder of this procedure, consider '*intraFreqReselection* in MIB' for non-RedCap UEs to be '*intraFreqReselectionRedCap* in SIB1' for RedCap UEs, if available*.***

**- If the field *intraFreqReselection* in *MIB* message for non-RedCap UEs is set to "allowed":**

**(…)**

**- If the field *intraFreqReselection* in *MIB* message for non-RedCap UEs is set to "not allowed":**

For update 3-2, 2 companies have a concern (i.e., the case that when UE could acquire but there is no RedCap specific IFRI is missed if we agreed this update.) In rapporteur understanding, the case *intraFreqReselectionRedCap* is absent is covered by the condition (i.e., If the field *intraFreqReselectionRedCap* in *SIB1* message is set to "allowed"), because TS 38.331 states:

**38.331**

2> if *intraFreqReselectionRedCap* is not present in *SIB1*:

3> consider the cell as barred in accordance with TS 38.304 [20];

3> perform barring as if *intraFreqReselectionRedCap* is set to allowed;

Meanwhile, a company proposed to keep the text (i.e., "not supporting RedCap UEs"), as follows:

- If the cell is to be treated as if the cell status is "barred" due to not supporting RedCap UEs, or due to being unable to acquire the *SIB1*:

11 out of 13 companies support this update. However, in email discussion [115], a company pointed out:

*When the case is due to "not supporting RedCap UEs", UE "shall" (rather than "may") exclude the barred cell for 5 minutes.*

Rapporteur understands it is aligned with legacy procedure, so would like to adopt the original proposal (i.e., update 3-2) removing "not supporting RedCap UEs".

**Proposal 5. (x/13) (To discuss). Adopt update 3-2 in proposed TP3 in R2-2206213:**

**- If the cell is to be treated as if the cell status is "barred" due to being unable to acquire the *SIB1*:**

## 3.3 Any further correction to discuss

If you think there is any further update needed in the last CR of TS 38.304 [1], please describe it in the table below.

|  |  |
| --- | --- |
| Company | Issue |
| Intel | We proposed in [3] that RAN2 discuss whether to clarify the different cases for selection of T based on eDRX cycle configured for a UE in RRC\_IDLE and RRC\_INACTIVE by using a table instead. Considering the corrections discussed in previous section, the updated table would look as follow:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **TeDRX, CN** | **TeDRX, RAN** | **T to monitor POs within** **CN configured PTW** | **T to monitor POs outside CN configured PTW** |
| UE in RRC\_IDLE | ≤ 10.24 sec. | none or any value  | TeDRX, CN  | NA |
| > 10.24 sec. | none or any value | Shortest of UE specific DRX (if configured by upper layers) and default DRX cycle (broadcasted in system information) | NA |
| UE in RRC\_INACTIVE | ≤ 10.24 sec. | none | Shortest of UE specific DRX value configured by RRC, and TeDRX, CN | NA |
| ≤ 10.24 sec. | ≤ 10.24 sec. | Shortest of TeDRX, RAN and TeDRX, CN  | NA |
| > 10.24 sec. | none | Shortest of UE specific DRX(s), TeDRX, CN and default DRX cycle (broadcasted in system information) | UE specific DRX value configured by RRC |
| > 10.24 sec. | ≤ 10.24 sec. | Shortest of UE specific DRX (if configured by upper layers), TeDRX, RAN and default DRX value (broadcasted in system information) | TeDRX, RAN |

 |
| ZTE | We propose in [5] to change the PO determination rule for RRC\_INACTIVE UE when eDRX is configured.In current spec, in case eDRX is configured and longer than 10.24s, the PO determination rule is applied only within PTW. The “out PTW” case is missing. This is not aligned with LTE eDRX. This difference causes additional complexity in UE implementation. Thus we propose RAN2 to consider to align NR with LTE in PO determination rule:7.1 Discontinuous Reception for paging*[--skipped--]*In RRC\_INACTIVE state, if the UE supports *inactiveStatePO-Determination* and the network broadcasts *ranPagingInIdlePO* with value "true", the UE shall use the same i\_s as for RRC\_IDLE state. Otherwise, the UE determines the i\_s based on the parameters and formula above.In RRC\_INACTIVE state, if eDRX value is configured by upper layers ~~is no longer than 1024 radio frames~~, the UE shall use the same i\_s as for RRC\_IDLE state.~~In RRC\_INACTIVE state, if eDRX value configured by upper layers is longer than 1024 radio frames, during CN PTW, the UE shall use the same i\_s as for RRC\_IDLE state.~~Corresponding description for LTE is quoted as following.7.1 Discontinuous Reception for paging*[--skipped--]*In RRC\_INACTIVE state, if the UE supports *inactiveStatePO-Determination* and the network broadcasts *ranPagingInIdlePO* with value "true"*,* the UE uses the T value applicable for RRC\_IDLE state for the determination of i\_s. Otherwise, the UE uses the T value applicable for RRC\_INACTIVE state.In RRC\_INACTIVE state, a BL UE or a UE in enhanced coverage uses the T value applicable for RRC\_IDLE state for the determination of PNB and i\_s. |
|  |  |
|  |  |

**Summary**: None

1. Conclusion (1st round)

Based on the outcome of the discussion, the rapporteur would like to suggest the following set of proposals:

**For agreements**:

**- Proposal 2. (13/13) (To agree) Adopt proposed TP2 (for determination of T) in R2-2206213, on top of changes in R2-2206023.**

**For discussion:**

**- Proposal 1. (8/13) (To discuss) Adopt proposed TP1 in R2-2206213 as baseline. This can be updated based on result of offline [110] (i.e., whether to introduce separate bits in SIB1).**

**- Proposal 3. (6/8) (To discuss) Not capture the table for determination of T in TS 38.304.**

**- Proposal 4. (4/13) (To discuss). Adopt the following TP in clause 5.3.1 in TS 38.304:**

**- If the UE is a RedCap UE, the UE shall acquire SIB1 and, in the remainder of this procedure, consider '*intraFreqReselection* in MIB' for non-RedCap UEs to be '*intraFreqReselectionRedCap* in SIB1' for RedCap UEs, if available*.***

**- If the field *intraFreqReselection* in *MIB* message for non-RedCap UEs is set to "allowed":**

**(…)**

**- If the field *intraFreqReselection* in *MIB* message for non-RedCap UEs is set to "not allowed":**

**- Proposal 5. (x/13) (To discuss). Adopt update 3-2 in proposed TP3 in R2-2206213:**

**- If the cell is to be treated as if the cell status is "barred" due to being unable to acquire the *SIB1*:**

5. Discussion (2nd round)

Note that all the corrections to be discussed in this document are based the latest 38.304 version (i.e., R2-2206023) [1]. Based on online decision in the week 2, the following discussion will be done.

## 3.1 Corrections on eDRX

In Phase 1 offline, rapporteur proposed:

**Proposal 1 (Phase1). (8/13) (To discuss) Adopt proposed TP1 in R2-2206213 as baseline. This can be updated based on result of offline [110] (i.e., whether to introduce separate bits in SIB1).**

The result of online discussion for this proposal is as follows:

|  |
| --- |
| Proposal 1. (8/13) (To discuss) Adopt proposed TP1 in R2-2206213 as baseline. This can be updated based on result of offline [110] (i.e., whether to introduce separate bits in SIB1).* Continue the discussion in CR updating phase
 |

Meanwhile, the following agreement is made via offline 110:

Agreements via email – from offline 110:

1. For extended DRX for RRC\_INACTIVE, introduce a new capability bit extendedDRX-r17 covering DRX values of 2.56s, 5.12s and 10.24s;
2. Introduce separate bits in SIB1 to indicate whether IDLE eDRX and/or INACTIVE eDRX are enabled. The INACTIVE eDRX may be enabled only if IDLE eDRX is enabled.
3. Capture RAN4 agreements as(can be revisited based on R1/4 latest conclusion):

 For FR1, 1 DL MIMO layer if 1 Rx branch is supported, and 2 DL MIMO layers if 2 Rx branches are supported; For FR2, either 1 or 2 DL MIMO layers can be supported, while 2 Rx branches are always supported. For FR1 and FR2, UE features and corresponding capabilities related to more than 2 UE Rx branches or more than 2 DL MIMO layers, as well as UE features and capabilities related to more than 2 UE Tx branches or more than 2 UL MIMO layers are not supported by RedCap UEs;

1. ReportAddNeighMeasForPeriodic-r16  is optional for RedCap UEs. Keep “It is optional for RedCap UEs.” From the field description.

Assuming separate bits in SIB are named as *eDRX-Allowed-Idle* and *eDRX-Allowed-Inacitve*, corresponding TP can be updated as follows:

|  |
| --- |
| TP1 (Phase2):*<Other TP is skipped>*The following parameters are used for the calculation of PF and i\_s above:T: DRX cycle of the UE.If *eDRX-Allowed-Idle* (when the UE is in RRC\_IDLE) or *eDRX-Allowed-Inactive* (when the UE is in RRC\_INACTIVE) is not signalled in SIB1 or eDRX is not configured as defined in clause 7.4:- T is determined by the shortest of the UE specific DRX value(s), if configured by RRC and/or upper layers, and a default DRX value broadcast in system information. In RRC\_IDLE state, if UE specific DRX is not configured by upper layers, the default value is applied.In RRC\_IDLE state, if *eDRX-Allowed-Idle* is signalled in SIB1 and eDRX is configured by upper layers, i.e., TeDRX, CN, according to clause 7.4:- If TeDRX, CN is no longer than 1024 radio frames:- T = TeDRX, CN;- else:- During CN configured PTW, T is determined by the shortest of UE specific DRX value, if configured by upper layers, and the default DRX value broadcast in system information.In RRC\_INACTIVE state, if *eDRX-Allowed-Inactive* is signalled in SIB1 and eDRX is configured by RRC, i.e., TeDRX, RAN , and/or upper layers, i.e., TeDRX, CN, as defined in clause 7.4:- If both TeDRX, CN and TeDRX, RAN are no longer than 1024 radio frames, T = min{TeDRX, RAN, TeDRX, CN}.- If TeDRX, CN is no longer than 1024 radio frames and no TeDRX, RAN is configured, T = min{DRX value configured by RRC, TeDRX, CN}.*<Other TP is skipped>* |

**Q1:** Do you support TP1 (Phase2) captured above, assuming the name of IEs may be updated.

|  |  |  |
| --- | --- | --- |
| Company | Yes or No | Comments |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary**: <TBD>

## 3.2 Corrections on cell barring

In Phase 1 offline, rapporteur proposed:

**Proposal 4 (Phase1). (4/13) (To discuss). Adopt the following TP in clause 5.3.1 in TS 38.304:**

**- If the UE is a RedCap UE, the UE shall acquire SIB1 and, in the remainder of this procedure, consider '*intraFreqReselection* in MIB' for non-RedCap UEs to be '*intraFreqReselectionRedCap* in SIB1' for RedCap UEs, if available*.***

**- If the field *intraFreqReselection* in *MIB* message for non-RedCap UEs is set to "allowed":**

**(…)**

**- If the field *intraFreqReselection* in *MIB* message for non-RedCap UEs is set to "not allowed":**

The result of online discussion for this proposal is as follows:

|  |
| --- |
| Proposal 4. (4/13) (To discuss). Adopt the following TP in clause 5.3.1 in TS 38.304:- If the UE is a RedCap UE, the UE shall acquire SIB1 and, in the remainder of this procedure, consider 'intraFreqReselection in MIB' for non-RedCap UEs to be 'intraFreqReselectionRedCap in SIB1' for RedCap UEs, if available.- If the field intraFreqReselection in MIB message for non-RedCap UEs is set to "allowed":(…)- If the field intraFreqReselection in MIB message for non-RedCap UEs is set to "not allowed":- Huawei thinks the proposed change only addresses the ambiguity of “remainder of this procedure”. But the original intention of the Todc is to add “If not available, RedCap UE skips the remainder of this procedure.” This is still needed to clarify that UE should skip remainder, if not available.- Samsung thinks that, if intraFreqReselectionRedCap in SIB1 is not available, since the last parts are “for non-RedCap UEs”, Redcap UEs will skip them.- Huawei thinks that “for non-RedCap UEs” only clarifies the field is the legacy one for non-RedCap UE, but does not clarify RedCap UE should skip. - Samsung suggests to add the following after the first “if” -     If the UE is a non-RedCap UE, or the UE is a RedCap UE and intraFreqReselectionRedCap in SIB1 is available:* Continue online
* Huawei and Xiaomi are ok with this
* Continue the discussion in CR updating phase based on the latest proposal from Samsung
 |

The latest proposal from Samsung (i.e., rapporteur) is as follows:

|  |
| --- |
| TP2 (Phase2):*<Other TP is skipped>*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 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:- If the UE is a RedCap UE, the UE shall acquire SIB1 and, in the remainder of this procedure, consider '*intraFreqReselection* in MIB' to be '*intraFreqReselectionRedCap* in SIB1', if available*.*- If the UE is a non-RedCap UE, or 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.- If the field *intraFreqReselection* in *MIB* message is set to "not allowed":- 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;- If the cell operates in licensed spectrum:- the UE shall not re-select to another cell on the same frequency as the barred cell and exclude such cell(s) as candidate(s) for cell selection/reselection for 300 seconds;- else:- the UE may select to another cell on the same frequency if the reselection criteria are fulfilled.- else:- If the cell operates in licensed spectrum, or if this cell belongs to a PLMN which is indicated as being equivalent to the registered PLMN or the selected PLMN of the UE, or if this cell belongs to the registered SNPN or the selected SNPN of the UE:- the UE shall not re-select to another cell on the same frequency as the barred cell and exclude such cell(s) as candidate(s) for cell selection/reselection for 300 seconds;- else:- the UE may select to another cell on the same frequency if the reselection criteria are fulfilled.- the UE shall exclude the barred cell as a candidate for cell selection/reselection for 300 seconds.*<Other TP is skipped>* |

**Q2:** Do you support TP2 (Phase2) captured above?

|  |  |  |
| --- | --- | --- |
| Company | Yes or No | Comments |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary**: <TBD>

In Phase 1 offline, rapporteur proposed:

**Proposal 5 (Phase1). (x/13) (To discuss). Adopt update 3-2 in proposed TP3 in R2-2206213:**

**- If the cell is to be treated as if the cell status is "barred" due to being unable to acquire the SIB1:**

The result of online discussion for this proposal is as follows:

|  |
| --- |
| Proposal 5. (11/13) (To agree). Adopt the following TP in clause 5.3.1 in TS 38.304:- If the cell is to be treated as if the cell status is "barred" due to not supporting RedCap UEs, or due to being unable to acquire the SIB1:* Regarding P5, the reason that Futurewei suggested moving the case of "barred" due to not supporting RedCap UEs to the “else” branch is because if we keep it in the “if” branch, that text says that “the UE may exclude the barred cell …”. That means the UE may still select to camp in the cell, which doesn’t support RedCap. Then, the UE may not get paged, or even when the UE gets paged, it won’t be able to access the cell anyway. By moving the case to the “else” branch, the RedCap UE shall exclude the cell for at least 5 min (and may come back and re-evaluate the cell later). We have no argument against using “may exclude” for missing SIB1. But knowing a cell doesn’t support RedCap, we think the UE “shall exclude” the cell for at least 5 min. Thanks.
* Samsung agrees with Futurewei and suggests to reword as follows:

Proposal 5. (?/13) (To discuss). Adopt the following TP in clause 5.3.1 in TS 38.304:- If the cell is to be treated as if the cell status is "barred"~~due to not supporting RedCap UEs, or~~due to being unable to acquire theSIB1:- Samsung suggests to add the following to the TP:-     If the field intraFreqReselectionRedCap in SIB1 message is set to "allowed", including the case that intraFreqReselectionRedCap is not present in SIB1 as specified in TS 38.331:* Continue online
* Huawei thinks this is ok as a baseline
* Xiaomi is fine as well
* Continue the discussion in CR updating phase based on the latest proposal from Samsung
 |

The latest proposal from Samsung (i.e., rapporteur) is as follows:

|  |
| --- |
| TP3 (Phase2):*<Other TP is skipped>*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.- else:- If the field *intraFreqReselectionRedCap* in *SIB1* message is set to "allowed", including the case that *intraFreqReselectionRedCap* is not present in *SIB1* as specified in TS 38.331:- 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.*<Other TP is skipped>* |

Please note that, according to 38.331, UE perform barring as if *intraFreqReselectionRedCap* is set to allowed for the case "not supporting RedCap UEs" (i.e., the case *intraFreqReselectionRedCap* is not present in SIB1).

|  |
| --- |
| **TS 38.331**2> if *intraFreqReselectionRedCap* is not present in *SIB1*:3> consider the cell as barred in accordance with TS 38.304 [20];3> perform barring as if *intraFreqReselectionRedCap* is set to allowed; |

The 2nd update in TP3 (Phase2) is to clarify this in 38.304 as well.

**Q2:** Do you support TP3 (Phase2) captured above?

|  |  |  |
| --- | --- | --- |
| Company | Yes or No | Comments |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary**: <TBD>

1. Conclusion (2nd round)

Based on the outcome of the discussion, the rapporteur would like to suggest the following set of proposals:

**For agreements**:

**<TBD>**

**For discussion:**

**<TBD>**

1. References

[1] [R2-2206023](file:///C%3A/Data/3GPP/Extracts/R2-2206023%20-%20Miscellaneous%20corrections%20for%20RedCap%20WI%20-%20TS%2038.304.docx), Miscellaneous corrections for RedCap WI, Ericsson

[2] [R2-2205090](file:///C%3A/Data/3GPP/Extracts/R2-2205090.docx), Corrections on eDRX, Samsung

[3] [R2-2204928](file:///C%3A/Data/3GPP/Extracts/R2-2204928_38.304_draftCR_eDRX.docx), Draft 38.304 CR for the eDRX handling, Intel Corporation

[4] [R2-2205150](file:///C%3A/Data/3GPP/Extracts/R2-2205150_Correction%20on%20DRX%20cycle%20of%20the%20UE%20for%20eDRX.docx), Correction on DRX cycle of the UE for eDRX, NEC

[5] [R2-2205769](file:///C%3A/Data/3GPP/Extracts/R2-2205769%20Corrections%20on%20eDRX.docx), Corrections on eDRX, ZTE Corporation

[6] [R2-2205337](file:///C%3A/Data/3GPP/Extracts/R2-2205337%20Other%20CP%20aspects%20for%20DRX%20cycle.docx), Other CP aspects for DRX cycle, LG

[7] [R2-2205613](file:///C%3A/Data/3GPP/Extracts/R2-2205613_38.304%20%20Corrections%20on%20Redcap%20UE%27s%20behavior%20on%20cellbar.docx), 38.304 Corrections on Redcap UE's behavior on cellbar, Xiaomi Communications, Huawei, HiSilicon