3GPP TSG-RAN WG2 Meeting#113-e Draft\_R2-2102153

Online, 25th Jan. - 5th Feb. 2021

Agenda Item: 7.3.3

Source: Huawei

Title: Summary of [AT113-e][303][NBIOT/eMTC R16] PUR corrections (Huawei)

Document for: Discussion and Decision

# Introduction

This document is for the following offline discussion on PUR corrections, phase Week 1:

* [AT113-e][303][NBIOT/eMTC R16] PUR corrections (Huawei)

 **Scope:**

Week 1:

 1) Try to achieve agreeable proposals based on [R2-2101033](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101033.zip).

 2) Check if there is sufficient support to pursue [R2-2101085](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101085.zip) and/or [R2-2101551](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101551.zip) and collect initial comments.

 Week 2:

1. Agree the CRs.
2. NOTE that the Week 2 discussion may be branched in case CRs are needed based on [R2-2101085](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101085.zip) and [R2-2101551](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101551.zip).

 **Intended outcome:**

 Week 1: Report in R2-2102153

 Week 2: Agreed CRs

 **Deadline:**

 Week 1: Jan 27 1100 UTC

 Week 2: Feb 04 1100 UTC

# Discussion

## R2-2101033 on TA reference

In [R2-2101033](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101033.zip), (N)RSRP based TA validation and (N)RSRP reference update for PUR was discussed. Regarding the cases in which the TA should be considered as (re-)validated and the (N)RSRP reference be updated, the following summary was made:

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| The following cases to consider TA to be (re-)validated and update the (N)RSRP reference were mentioned in the discussion:

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| Case # | Description | Whether to update the (N)RSRP reference |
| Case 1 | PUR TA timer is (re-)started if RSRP based TA validation is configured | Yes or acceptable (5 companies) |
| Case 2 | RSRP threshold is configured | Yes (5 companies) |
| Case 3 | RSRP threshold is reconfigured | Yes (3 companies)No (2 companies) |
| Case 4 | When TA value is updated by TAC MAC CE or DCI as specified in TS 36.212 | Yes (5 companies) |
| Case 5 | If PUR transmission is acknowledged by the NW, i.e. upon reception of L1 signalling (even if TA is not updated) or RRC release message followed by PUR transmission (even if PUR configuration is not updated) | Yes (1 company) |

Based on above summary, regarding in which cases to update (N)RSRP reference, the following is proposed:**Proposal 1: In case (N)RSRP based validation is configured, the (N)RSRP reference needs to be updated in the following cases:*** PUR TA timer is (re-)started
* RSRP reference is configured
* TA value is updated by TAC MAC CE or (N)PDCCH indicates timing advance adjustment as specified in TS 36.212

**Proposal 2: FFS whether the (N)RSRP reference needs to be updated in case (N)RSRP threshold is reconfigured.** |

According to above summary, it seems all companies think that the (N)RSRP reference needs to be updated in the cases listed in Proposal 1.

**Question 1. Companies who do not agree with above proposal 1 are invited to provide their concerns.**

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| ***Company name*** | ***Concerns if any*** |
| Huawei, HiSilicon | We support the proposal. |
| ZTE | We support the proposal. Editorial comment: “RSRP reference is configured” should be “the (N)RSRP threshold is configured” |
| LGE | We support the proposal and have the same comment with ZTE. It should be “(N)RSRP threshold is configured.”  |
| vivo | We share a similar view with ZTE and LGE, and would like to revise it as “(N)RSRP change threshold is configured”. Additionally, for the third bullet, we think the term “as specified in TS 36.212” can be removed for succinctness.  |
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**Summary:**

No objection on Proposal 1. Only two comments on the wording. Thus, it is proposed to agree Proposal 1 with small update:

**Proposal 1: In case (N)RSRP based validation is configured, the (N)RSRP reference needs to be updated in the following cases:**

* PUR TA timer is (re-)started
* (N)RSRP threshold is configured
* TA value is updated by TAC MAC CE or (N)PDCCH indicates timing advance adjustment

In case (N)RSRP threshold is reconfigured, 3 companies think that (N)RSRP reference needs to be updated, while 2 companies disagree. Thus in Proposal 2 it was propose to further discuss the case.

**Question 2. In case (N)RSRP threshold is reconfigured, do you think TA should be considered as (re-)validated and the (N)RSRP reference updated?**

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| ***Company name*** | ***Opinion*** | ***Comments*** |
| Huawei, HiSilicon | No | We think the update of (N)RSRP only means that the requirements on (N)RSRP based TA validation has been changed. It does not mean the TA has been revalidated. |
| Qualcomm | Yes | See email discussion report (to avoid repeating the same comments). |
| ZTE | No | Re-emphasize our comments during email discussion below:* Per our understanding, the intention of both check on TA timer/value and check on (N)RSRP change is to check whether the valid TA is maintained (e.g., based on such check/validation, UE can make sure it's has no/less mobility and TA is kept valid). Therefore we think check on TA timer/value and check on (N)RSRP change should be kept consistence. Each time the UE starts a new round check on TA timer/value check (e.g., triggered by TA value update), the UE should start a new round check on (N)RSRP change (e.g., to update (N)RSRP reference). That's the reason why we think (N)RSRP reference needs to be update upon reception of PUR TAT value. However, the update of pur-NRSRP-ChangeThreshold is irrelevant as this threshold only reflects the tolerance range on (N)RSRP change. We see no reason to let reconfiguration of this parameter have impact on the start point of check on (N)RSRP change.
* This check on (N)RSRP change for PUR can be analogous to relaxed monitoring function. We can see that the SrxlevRef is also NOT updated when s-SearchDeltaP is (re)provided in SIB.
 |
| Ericsson | Yes | If new value is provided in configuration, it would make sense to us to update the reference value as well. In case threshold value is not provided, need ON applies, i.e., existing value is used, and there is no need to update the reference. |
| LGE | Yes | No strong view but we tend to agree with Ericsson.  |
| vivo | No | Generally, we think the evaluation procedure is independent of parameter reconfigurations. Take RLM as example, when the RLM-RS is reconfigured, the UE doesn’t need to immediately evaluate the link quality. We think the same logic is applied for TA validation.  |
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**Summary:**

In case (N)RSRP threshold is reconfigured, 3 companies think TA should be considered as (re-)validated and the (N)RSRP reference updated, 3 companies disagree.

**Proposal 3: Decide online whether the (N)RSRP reference should be updated In case (N)RSRP threshold is reconfigured.**

Based on the discussion in [R2-2101033](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101033.zip) and the above proposals 1 and 2, two CRs were submitted.

**MAC CR: R2-2101035**

**Question 3. Based on reply to Questions 1 and 2, companies are invited to provide initial comments on MAC CR** **R2-2101035.**

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| ***Company name*** | ***Comments*** |
| Huawei, HiSilicon | We support the CR |
| Qualcomm | CR is ok |
| ZTE | We support the CR and no comment now. |
| Ericsson | We are OK with the CR. |
| LGE | We are fine with the CR.  |
| vivo | Just one minor editorial comment for rapporteur to consider, the verb “updated” is supposed to be “adjusted”, just to align with 36.213.  |
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**Summary:**

The MAC CR looks agreeable. One editorial comment is received and we think it can be discussed in Week 2.

**RRC CR: R2-2101034**

**Question 4. Based on reply to Questions 1 and 2, companies are invited to provide initial comments on RRC CR R2-2101034.**

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| ***Company name*** | ***Comments*** |
| Huawei, HiSilicon | The case that (N)RSRP threshold is reconfigured should be excluded in the CR. |
| Qualcomm | We are ok with the intention of the CR. Cover page needs update to remove FFS (related to Q2).We are generally ok with the current changes as well. However, we have one more comment in 5.3.3.19. While it is clear that TA is considered valid when 1) if configured, TA timer is running AND 2) if configured, RSRP change has not crossed the threshold(s), what is not clear is what if one or both of these are NOT configured. In such case, the UE shall also consider TA to be valid. But from the current text, it could be argued that since both conditions didn’t apply, TA is invalid which would be wrong interpretation. So, we have added further suggestions in the draft folder to update the text to the following (which may also address the concern discussed in Q5).5.3.3.19 Timing alignment validation for transmission using PURThe UE shall consider the timing alignment value for transmission using PUR to be valid when all of the following conditions are fulfilled:1> either *pur-TimeAlignmentTimer* is not configured or *pur-TimeAlignmentTimer* is running as confirmed by lower layers; and1> either *pur-RSRP-ChangeThreshold* (*pur-NRSRP-ChangeThreshold* in NB-IoT) is not configured or the following conditions are fulfilled:2> compared to the stored serving cell reference (N)RSRP value, the serving cell (N)RSRP has not increased by more than *increaseThresh*; and2> compared to the stored serving cell reference (N)RSRP value, the serving cell (N)RSRP has not decreased by more than *decreaseThresh*; |
| ZTE | Agree with Huawei and no other comments now (maybe double check later). |
| Ericsson | We are OK with the CR and the proposal from QC assuming that they are referring to the concern in Q6 not Q5. |
| LGE | We are fine with the CR. |
| vivo | Another minor editorial comment for rapporteur to consider, the term “timing alignment value update” is supposed to be “Timing Advance value adjustment”. |
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**Summary:**

All companies are OK with the intention of the CR. According to above comments, the following need to be considered in Week 2 discussion to update the CR:

* The CR needs to be updated based on the outcome of the case that (N)RSRP threshold is reconfigured.
* In case both timer based and (N)RSRP based TA validation is configured, whether the TA will be considered as invalid.
* To update “timing alignment value update” to “Timing Advance value adjustment”.

## R2-2101085 on Drb-ContinueROHC for UP-PUR

In [R2-2101085](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101085.zip), it was proposed to clarify that the field drb-ContinueROHC is optionally present if the UE supports UP-EDT or UP transmission using PUR, for the following reason:

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| ***Reason for change:***“*For UP-PUR transmission, it is supposed that the UE would continue the header compression protocol context for the DRBs configured with the header compression protocol, if drb-ContinueROHC has been provided in immediately preceding RRC connection release message. However, the condition tag “UP-EDT” for drb-ContinueROHC in the RRCConnectionRelease message restricts that this field can be only optionally present in the case of UP-EDT. As a result, the network cannot provide drb-ContinueROHC to a PUR-capable UE, making the UE always reset the header compression protocol context for DRB(s) in the PUR transmission procedure.*” |

**Question 5. Do you agree with the intention of CR R2-2101085?**

* **Yes, any initial comment on CR R2-2101085?**
* **No, why?**

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| ***Company name*** | ***Yes/No?*** | ***Comments*** |
| Huawei, HiSilicon | Yes | 1. The CR only applies to eMTC thus the WI code on the coverpage needs to be updated
2. Maybe the name of the condition does not need to be updated to keep alignment with NB-IoT:

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| *UP-EDT* | The field is optionally present, Need ON, if the UE supports UP-EDT or UP transmission using PUR and *releaseCause* is set to *rrc-Suspend*; otherwise the field is not present. |

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| Qualcomm | Yes | Minor comment: Cond name could be UP-EDTorPUR (i.e., only add orPUR to keep the legacy “UP-EDT” intact) |
| ZTE | Yes |  |
| Ericsson | Yes | Agree with HW that the cover page needs to be updated and support QC’s proposal regarding the condition name. |
| LGE | Yes | Agree with Huawei |
| vivo | Yes | Agree with Ericsson. |
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**Summary:**

All companies agree with the intention. There are also comments on the details of the CR:

* NB-IoT WI code should be removed on the coverpage as the CR only applies to eMTC.
* The condition name needs to be updated, e.g. *UP-EDT* or *UP-EDTorPUR*.

**Proposal 3: Agree on intention of CR R2-2101085 on Drb-ContinueROHC for UP-PUR. The following updates are needed on the current CR:**

* NB-IoT WI code should be removed.
* The condition name needs to be updated, e.g. *UP-EDT* or *UP-EDTorPUR*.

## R2-2101551 on pur-TimeAlignmentTimer

In [R2-2101551](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101551.zip), it was proposed to clarify that if pur-TimeAlignmentTimer is not present the value of infinity shall be used:

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| ***Reason for change:***RAN2 made the following agreements on how *pur-TimeAlignmentTimer* is configured for PUR:* Configuration for TA validation criteria is provided in dedicated RRC signaling.
	+ It should be possible to disable each or all of the optional TA validation criteria (i.e., TA timer, (N)RSRP change) via RRC signaling.
* A new TA timer is defined for UEs configured with D-PUR in idle mode.
	+ The (re)starting times for TA timer need to be aligned between UE and eNB. The details of the mechanism are FFS.
	+ TA timer is restarted after TA is updated.
	+ The value range for the TA timer is FFS. Value of “infinity” is possible.
* PUR TA timer is configurable up to hour(s) level, disabled/infinity is possible.
	+ Exact values FFS.
* TA timer range is multiple of PUR periodicities, e.g. 1,…, 8.
	+ FFS on exact values and whether offset is applied so that e.g. retransmissions are covered.
* For both NB-IoT and eMTC, the value range of pur-TimeAlignmentTimer-r16 is INTEGER (1..8), i.e. 1~8 \* PUR periodicity.

 Even though it was agreed that it should be possible to have the value “infinity” for the TA timer, i.e., *pur-TimeAlignmentTimer*, it is not clear whether/how this agreement has been captured in the specifications. |

**Question 6. Do you agree with the intention of CR R2-2101551?**

* **Yes, any initial comment on CR R2-2101551?**
* **No, why?**

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| ***Company name*** | ***Yes/No?*** | ***Comments*** |
| Huawei, HiSilicon | No | In our view, if pur-TimeAlignmentTimer is not configured, TA will be considered as always valid. This implicitly means infinity value.According to current specification, if the timer is not configured, the timer will not be checked in MAC at all. Thus the added sentence “If the field is not present the value of infinity shall be used” is not correct. |
| Qualcomm | No | Current spec supports the effect of infinite timer as intended, when timer-based TA validation is NOT configured (i.e. TA is always considered valid from this validation criterion point of view).  |
| ZTE | No | Agree with above comments. |
| Ericsson | Yes | We agree that in principle if *pur-TimeAlignmentTimer* is not configured, TA is considered as always valid and this implicitly means that it has the value infinity. However, in 5.3.3.19, we have captured the following text: “A UE shall consider the timing alignment value for transmission using PUR to be valid when all of the following conditions are fulfilled:” and when one checks the conditions it implies that *pur-TimeAlignmentTimer* should be configured for TA to be considered as valid. This contradicts with the intention and therefore a change is required. Note that in Q4, QC has brought up a suggestion to update the procedural text to address the same concern in our opinion, i.e., “But from the current text, it could be argued that since both conditions didn’t apply, TA is invalid which would be wrong interpretation.” We are also fine with the suggested update. |
| LGE | - | We agree that the intention was to make “infinity” but the current specification looks like, if pur-TimeAlignmentTimer is not configured, it means “disabled” such that the UE doesn’t need to check the validity. In either way (“infinity” or “disabled”), the UE behaviour should be the same, but we are fine to make clarification somewhere in spec.  |
| vivo | No | In our understanding, if the *pur-TimeAlignmentTimer* is not configured, then the condition “*pur-TimeAlignmentTimer* is running as confirmed by lower layers” will not existed for evaluation. Specifically, if neither *pur-TimeAlignmentTimer* nor *pur-RSRP-ChangeThreshold* is configured, that means all the conditions are not existed. As a result, all of the following conditions can be fulfilled since there are no conditions need to be evaluated.  |
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**Summary:**

All companies think that if pur-TimeAlignmentTimer is not configured, TA is always considered as valid. This is the same as the case that the timer has infinity value. Based on this understanding, 5 companies think the change in the CR is not needed. The source company thinks that the TP provided by Qualcomm on Question 4 can also address the original concern.

**Proposal 4: CR R2-2101551 is not pursed.**

# Summary

TBD

# Conclusion

This offline discussion focused on PUR corrections

**TBD**

# References

1. R2-2101033, “Summary of email discussion [351] (N)RSRP reference for TA validation for PUR”, Huawei, RAN2#113e, Online
2. R2-2101034, “Clarification on the (N)RSRP reference for TA validation for PUR”, Huawei, HiSilicon, RAN2#113e, Online
3. R2-2101035, “Clarification on the (N)RSRP reference for TA validation for PUR”, Huawei, HiSilicon, RAN2#113e, Online
4. R2-2101085, “Correction on Drb-ContinueROHC for UP-PUR”, vivo, RAN2#113e, Online
5. R2-2101551, “Correction to timing alignment validation for transmission using PUR”, Ericsson, RAN2#113e, Online

# Contact delegates

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| --- | --- | --- |
| **Delegate** | **Company name** | **Email** |
| Baokun Shan | Huawei, HiSilicon | baokun.shan@huawei.com |
| Umesh Phuyal | Qualcomm | uphuyal @qti.qualcomm.com |
| Tuomas/Emre | Ericsson |  |
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