[91E][29][Power_saving_scope] - Version 0.0.7
RAN

3GPP TSG-RAN Meeting # 91-e

Electronic Meeting, March 16-26, 2021

RP-210860

Agenda item: 9.7.7

Source: Moderator (MediaTek)

Document for: Information

1 Background

In RP-210329, there raises concern that current RAN4 RLM/BFD relaxation work is out of WID scope. In particular, the following proposals are provided:

Table 1: Proposals on RAN4 RLM/BFD relaxation work from RP-210329

Proposal 1: Serving cell RRM measurement relaxation is not in the scope of the WI, and therefore should not be considered alongside with RLM/BFD measurement relaxation in RAN4 within the current work item for UE power saving enhancements for NR.
Proposal 2: RAN#91e should provide guidance to RAN4 to follow the approved WID objectives in its work i.e. not to consider UE RRM measurement relaxations further as part of the WID on UE Power Saving Enhancements for NR.

In this document, we first check companies' understanding on the potential out-of-scope issue (Section 2) and collect companies' opinions on what RAN Plenary action is suggested for Rel-17 WI of UE power saving enhancements for NR (Section 3).

2 Check on Issue Understanding

In Figure 1, there compare WID scope on RLM/BFD relaxation and the RAN4 WF agreement highlighted in RP-210329:

From the comparison, Question 1 below is to check companies' views on whether the RAN4 WF agreement is out of WID scope on RLM/BFD relaxation:

Question 1: Whether the RAN4 WF agreement in Figure 1 is out of WID scope on RLM/BFD relaxation?

Scope item 2) – b) in WID (RP-200938)
2) Study and specify, if agreed, enhancements on power saving techniques for connected-mode UE, subject to minimized system performance impact [RAN1, RAN4] b) Study the feasibility and performance impact of relaxing UE measurements for RLM and/or BFD, particularly for low mobility UE with short DRX periodicity/cycle, and specify, if agreed, relaxation in the corresponding requirements [RAN4] - NOTE: Supplementary RAN2 work, if needed, can be triggered by RAN4 LS
RAN4 WF (R4-2103670)
<u>Issue 2-2-1: Confirmation on beneficial Scenarios, from UE power saving gain perspective</u> Agreements • Further evaluate UE power saving gains for the following UE implementations: • **UE meets Rel-15 RRM measurement period and accuracy requirements** • **Option 1**: • UE uses all L1 samples for RRM measurements based on Rel-15 assumptions • **Option 2**: • How many L1 samples UE applies for RRM measurements is up to UE implementation (e.g. UE can use lower number of measurement samples for RRM measurements) • Further discuss how many samples to use for evaluations • Companies shall evaluate RRM measurements accuracy for the proposed number of samples. • FFS whether Option 2 can be considered for requirements definition • Further assess impact on PDCCH monitoring due to relax UE measurements for RLM/BFD

Figure 1: Comparison between WID scope on RLM/BFD relaxation and the concerned RAN4 WF agreement

A: Yes. The RAN4 agreement is out of WID scope on RLM/BFD relaxation

B: No. The RAN4 agreement is NOT out of WID scope on RLM/BFD relaxation

Your opinion(s) in the Feedback Form 1 is highly appreciated

Feedback Form 1: Companies's views to Question 1

Item	Company	Comments
1	QUALCOMM JAPAN LLC.	B: The feasibility for the relaxation of RRM measurement needs to be discussed and confirmed to justify the gain of RLM/BFD relaxation. This is becasue of the understanding that only reducing RLM/BFD while still fully performing RRM would not povide compelling power gain. But RRM relaxation itself does not require any standard change because it is supposed to be done by implementation without affecting RRM measurement requirements.
2	Beijing Xiaomi Mobile Software	A.

Item	Company	Comments
3	Beijing Xiaomi Mobile Software	A. Similar to the RRM measurement relaxation discussion in R17 redcap, where the conclusion from last RAN2 meeting is that serving cell RRM relaxation for Redcap UEs is not considered in Rel-17 based on people's concerns that it will have negative impact on the overall system performance, e.g. in terms of increased HO failures. Therefore, we think Serving cell RRM measurement relaxation should not be considered alongside with RLM/BFD measurement relaxation in RAN4.
4	Guangdong OPPO Mobile Telecom.	A. We think the agreement is out of the WI scope. It would be difficult for companies to converge on solutions if they assume different RRM. Thus, although the power saving only consider RLF/BFD may not be the best, we should stick with the description for common study.
5	Ericsson LM	A. The RRM relaxation is clearly out of scope of the WID.
6	China Mobile Com. Corporation	A. First, we think serving cell RRM relaxation should not be considered in Rel-17. The two options are used for power saving evaluation, companies can indicate how many samples they use during the evaluation. But option2 cannot be used for requirements definition.
7	Nokia Corporation	A. RRM relaxations are clearly out of scope of the WID. Thus, the option 2 in the RAN4 WF is out of scope of the WID.
8	vivo Mobile Communication Co.,	B. It is very clear that the RAN4 discussion and decision is NOT out of current scope, as it was agreed in RAN4 that "UE meets Rel-15 RRM measurement period and accuracy requirements". Option 2 only has impact on UE implementation. There is no standard impact or specification change on RRM requirements by reducing the RRM sample. This is just the model for evaluation. It seems that some companies misunderstood that the question, which is "whether RAN4 agreement is out of scope" but not "whether RRM relaxation is out of scope".
9	MediaTek Inc.	Even in Rel-15, UE is already allowed to take less sample as long as UE can meet RAN4 requirements (delay/accuracy). The L3 measurement delay requirement defines only a period of time that UE has to keep monitoring a target cell, but not the exact 5 or 8 samples UE has to measure. Given that RAN4 agreement already clearly states that "**UE meets Rel-15 RRM measurement period and accuracy requirements**", our question to companies is on which requirement do you think it is still relaxed?
10	ZTE Corporation	A. This WID item is to address the potential RLM/BFD relaxation, instead of RRM measurement relaxation, e.g. reducing L1 measurement samples. Hence, The option 2 in the WF is out of the WID scope. And regarding the bullet "FFS whether Option 2 can be considered for requirements definition", we think it is confusing. If the "requirement definition" refers to "RRM measurement requirement ", it is also out of scope.

Item	Company	Comments
11	Guangdong OPPO Mobile Telecom.	Additional comments, There is only choice of A or B. Seems ask companies select either the whole agreements is out of scope or not. To further clarify, we think the agreement is patially outof scope as we indicated in the second question. Or may be we should re-organize the question. Just clarify our view.
12	Huawei Technologies France	Huawei, HiSilicon: We support A. The scope of the WID is to study the feasibility of RLM/BFD relaxation only. The relaxation should not be coupled with any relaxation on other aspects (such as RRM or L1-RSRP). It is not clear whether the power saving gain comes from RLM relaxation or not if RRM measurement is also relaxed.
13	Intel Corporation (UK) Ltd	RAN4 VC (Andrey): As a session chair in RAN4, where the agreement was made, I'd like to provide a bit more information on the discussion, so that everyone is on the same page. Hope it can help with the discussion. During the RAN4 discussion several companies mentioned that RRM relaxations are out of scope of the WID, while several companies had a different view. In order to make sure that Rel-15 requirements are kept (not relaxed) and comply with the WID, the RAN4 agreement explicitly included proposal that "UE meets Rel-15 RRM measurement period and accuracy requirements". During further discussion several companies mentioned that Option 2 may not necessarily comply with the WI scope and there was no consensus on the proper interpretation. Therefore, it was additionally agreed that "FFS whether Option 2 can be considered for requirements definition". So, the general plan was not to preclude further evaluations for both options, but come back to the final decision on this issue in the upcoming RAN4 meetings. In terms of RAN4 progress, I think it can be helpful to make further clarifications on the WI scope.

3 Action for WID Scope

After checking companies' understanding on whether there is out-of-scope issue, we would like to further check companies's views on suggested RAN Plenary action by Question 2:

Question 2: What is your suggested RAN Plenary action based on your view(s) to Question 1?

A: Revise RAN4 agreement by removing Option 2.

B: Provide RAN Plenary guidance, e.g., No specification impact to RRM measurement requirements is expected for Rel-17 WI of UE power saving enhancements for NR.

C: No need of any RAN Plenary action. RAN4 continues their work as agreed.

D: Other suggested action (please describe it)

Your opinion(s) in the Feedback Form 2 is highly appreciated

Feedback Form 2: Companies' suggestion on RAN Plenary action

Item	Company	Comments
1	QUALCOMM JAPAN LLC.	C: RAN4 knows what they are doing.
2	Beijing Xiaomi Mobile Software	B
3	Guangdong OPPO Mobile Telecom.	B. We would prefer B. The problematic part is FFs, thus no overturn is needed.
4	Ericsson LM	B. RAN should provide guidance that RRM relaxation is out of the scope of R17 power saving WI. Such guidance is important to avoid confusion in RAN4.
5	China Mobile Com. Corporation	We prefer option B in order to avoid the confusion and additional discussion in RAN4.
6	Nokia Corporation	A and B: In our view RAN should provide clear guidance to RAN4 that RRM relaxations are out of the scope of the current WID and thus, should not be discussed in RAN4. Furthermore, RAN should also indicate that the option 2 in the RAN4 WF is not according to the WID and thus, should be removed.
7	MediaTek Inc.	RAN4 agreement already says that "**UE meets Rel-15 RRM measurement period and accuracy requirements**". This means the L3 measurement requirements will still be fulfilled. We believed that this RAN4 agreement is already sufficient to address the concern raised by companies.
8	vivo Mobile Communication Co.,	Prefer C. And B is also acceptable, as this is RAN4 understanding that there is no specification impact to RRM requirements here.
9	ZTE Corporation	B.This WID item is not intended for RRM measurement relaxation. Hence, no spec impact on RRM measurement is expected. Furthermore, it is better to clarify the "requirement definition" in the bullet "FFS whether Option 2 can be considered for requirements definition" and possibility of changing the RRM measurement requirement definition should be excluded.
10	Huawei Technologies France	Huawei, HiSilicon: A is preferred.

4 Initial Round Summary

From Question 1 and Feedback Form 1, there are 7 companies showing out-of-scope concern and 3 companies claiming no out-of-scope. In this regard, we should clarify how to resolve the out-of-scope concern.

There is one comment from RAN4 VC (Andrey) indicating that current RAN4 agreement already **addressed companies' out-of-scope concern during RAN4 discussion by explicitly adding "UE meets Rel-15 RRM measurement period and accuracy requirements"**. It is, however, noticed that, the UE requirements and Options 1 and 2 are all **evaluation assumptions**. As commented by CMCC, "Option2 cannot be used for requirements definition", **the real concern looks on the bullet "FFS whether Option 2 can be considered for requirements definition" that may allow adjusting RRM measurement requirements definition**. Instead of revising the evaluation assumptions, **RAN plenary action can focus on how to avoid any specification impact to RRM measurement requirements**

From Question 2 and Feedback Form 2, there are 5 companies that support action B, 3 companies support action C, 1 company prefers action A and 1 company suggests actions A+B. Since **action B has the majority support and can explicitly avoid any specification impact to RRM measurement requirements**, it is the best WF for resolving the out-of-scope concern in RAN4 RLM/BFD relaxation work.

5 Intermediate Round: RAN Plenary Guidance

From the summary in Section 4, the following proposal is suggested:

Proposed Agreement (RAN Plenary Guidance to RAN4):

For Rel-17 WI of UE power saving enhancements for NR, no specification impact to RRM measurement period and accuracy requirements is expected.

Companies please provide your views on whether to support the agreement and what is your suggested revision, if available, in Feedback Form 3 below:

Feedback Form 3: Companies' Views on Proposed RAN Plenary Guidance to RAN4

Item	Company	Comments
1	CATT	This issue should be handled by RAN4 without any plenary guideline. Most of technical discussions of objectives in the WI might need to involve with other aspects, such as assumptions, limitation, and other related issues. RAN4 chairman should be able to handle the technical discussion without further guidance from plenary. Note: The first round discussion was triggered late with 5 hour response window, which falled to night time in North America.
2	Futurewei Technologies	We are ok with the moderator proposal. Also noted that first round was started too late for us to participate in NA.

Item	Company	Comments
3	QUALCOMM JAPAN LLC.	We are fine with the moderator proposal. This has been our understanding as we commented previously.
4	Apple Hungary Kft.	We are fine with the proposal. This also align with RAN4 agreement that "UE meets Rel-15 RRM measurement period and accuracy requirements".
5	vivo Communication Technology	We believe the intent of the proposal is the same as RAN4 agreement already (i.e. UE meets the Rel-15 RRM measurement period and accuracy requirements). However, we think "RRM" is missing in the moderator proposal which may cause some mis-interpretation, so suggest to add RRM back. **For Rel-17 WI of UE power saving enhancements for NR, no specification impact to RRM measurement period and accuracy requirements is expected.**
6	MediaTek Inc.	We are supportive to this proposal. RAN Plenary should provide guidance to RAN4 specification impact instead of revising evaluation assumptions for RAN4. Regarding the consistence between Section 4 summary and Section proposal, "RRM" term before "measurement period and accuracy requirements" is added. This should also address vivo's suggestion.
7	Ericsson LM	We are fine with the moderator proposal. It is better to capture agreements in a WF or proper guidance captured in RAN meeting minutes to avoid confusion.
8	Guangdong OPPO Mobile Telecom.	We are fine for put that recommendation to RAN4, as it is following the Scope of the WI. The added "RRM" by MediaTek is also good.
9	Beijing Xiaomi Mobile Software	We are fine with the moderator proposal. RAN should provide guidance to exclude companies' concern on the possible spec impact on RRM measurement requirements.
10	Spreadtrum Communications	We are fine with the proposed agreement.
11	Nokia Corporation	We are quite ok with moderator's proposal but in our view the following wording would be more accurate as the UE also need to meet e.g. the event-triggered reporting requirements: For Rel-17 WI of UE power saving enhancements for NR, no specification impact to RRM mobility procedures and accuracy requirements is expected Furthermore, in our view it is critical that RAN provides clear guidance to RAN4 in a written form e.g. in RAN agreed WF.
12	ZTE Corporation	We are okay with the moderator's proposal in principle. We think the proposal suggested by Nokia is better and more general considering other RRM measurement procedures. We also think it is essential to clearly capture this RAN guidance to avoid potential duplicated discussion in RAN4.

Item	Company	Comments
13	China Mobile Com. Corporation	We are ok with the moderator proposal.
14	Huawei Technologies France	RRM measurement relaxation is out of scope of power saving enhancement. Therefore, the evaluation of power saving gains shall not involve any RRM measurement relaxation solution. Option 2 implies that the UE uses less measurement samples for RRM measurements, which is also a kind of RRM measurement relaxation solution compared with R15/R16 RRM measurements. The evaluation of power saving gains with Option 2 is out of the scope either. To avoid ambiguity, the proposed agreements are suggested as 'The study and evaluation of power saving enhancement need to be focused on RLM/BFD measurement relaxation only.

6 Summary

From the intermediate round of discussion, there are 12 companies ok with the proposed agreement, 1 company thinks no need of RAN Plenary guidance and 1 company suggests an alternative agreement. From the statistics, it is reasonable to suggest the proposed agreement for final endorsement.

Regarding Nokia's and ZTE's suggestions on revising "RRM measurement period and accuracy requirements" to "RRM mobility procedures and accuracy requirements", the formal terminology is from current RAN4 agreement so that we can assume RAN4 has clear understanding. The later terminology may cause confusion to RAN4 on what specification is related. For clear guidance to RAN4, the formal terminology is recommended.

Regarding Huawei's alternative proposal, our reading on current RAN4 agreement is that RAN4 will responsibly check whether UE meets Rel-15 RRM measurement period and accuracy requirements. Since specification cannot preclude UE implementation that meets the requirements, Option 2 that requests "Companies shall evaluate RRM measurements accuracy for the proposed number of samples" actually mandates more evaluations to ensure RRM performance. On the other hand, the alternative proposal, "The study and evaluation of power saving enhancement need to be focused on RLM/BFD measurement relaxation only", may give the wrong impression that RRM performance check is not needed. In this regard, current proposed agreement is still recommended.

Regarding CATT's comment that no need of RAN Plenary guidance, current proposed agreement is a generic expectation on specification impact instead of micro managing RAN4 operations. This should be able to minimize the concern on impacting RAN4 work.

After further email discussion on proposal wording, the following revision is finally approved as RAN plenary guidance to RAN4:

Agreements

RAN Plenary guidance to RAN4: For Rel-17 WI of UE power saving enhancements for NR, no specification impact to RRM measurement procedure requirements and measurement performance requirements is expected.