

[91E][23][FeMIMO_scope] Moderator Summary - Version 0.0.4
RAN

3GPP TSG-RAN Meeting # 91-e RP-210832

Electronic Meeting, March 16-26, 2021

Agenda item: 9.7.1

Source: Moderator (Samsung)

Title: Moderator's summary of email discussion [91E][23][FeMIMO_scope]

Document for: Information

1 Introduction

Per chairman's instruction, the goal and pertinent contributions for this email discussion is as follows:

Topic: Potential scope adjustment for FeMIMO

Input contributions covered: RP-210291, RP-210313

2 Initial round

Given the state of the work in RAN1 on L1/L2-centric inter-cell mobility (as a part of multi-beam enhancements) and inter-cell multi-TRP:

Q1: Is the following proposal for revising RAN2 timeline and TU allocation agreeable?

Table 1:

RAN2#114 (2021/05)	RAN2#115 (2021/08)	RAN2#115bis (2021/10)	RAN2#116 (2021/11)	RAN2#117 (2022/02)	RAN2#117bis (2022/04)
0.5 TU	0.5 TU	0.5 TU	1 TU	1 TU	1 TU

Q2: While the exact RAN2 work scope largely depends on the response from RAN2 for the LS R1-2102248 (hence cannot be finalized), please share your view on the approximate work scope.

Feedback Form 1: Companies' views on Q1 and Q2

Item	Company	Comments
1	Samsung Research America	[Mod] Please share your views on Q1 and Q2. Thanks
2	vivo Communication Technology	Q1: Proposed RAN2 timeline and TU allocation, in general looks fine, we would like to hear from RAN2 chair whether the proposal suits RAN2 arrangement. Q2: We agree that it is early to discuss work scope before RAN2 discusses the LS from RAN1, however looking at the numerous questions from RAN1 while there are many open issues, and in our view L1/L2 centric mobility (handover) will require a complete overhaul of handover mechanism. There will be significant RAN2 involvement pertaining FeMIMO even after excluding L1/L2 centric mobility (handover), RAN2 work scope should consider what can be completed in Rel-17 time frame.
3	Apple GmbH	Q1: The proposed revised RAN2 timeline and TU allocation looks good to us Q2: Response from RAN2 to the RAN1 LS is important for RAN1 to understand the scope, and the design direction/details, especially for L1/L2 centric mobility. Judging from the number of questions in the RAN1 LS, it is very likely that more TU is desirable from RAN2 to complete the L1/L2 centric mobility.
4	CATT	CATT Q1: The proposed RAN2 timeline and TU allocation looks fine to us. Q2: We share Apple's view that there seems to be a good chance that some RAN2 TU will be needed to complete the enhancement of L1/L2 centric mobility, given the list of questions in the RAN1 LS.
5	Ericsson LM	Q1: The proposed timeline is fine to us. Q2: We propose to respect the original scope of the work which was to design solutions without any UP changes. Thus we should discuss only those scenarios where there is no user plane impact e.g., intra-DU inter-cell mobility/switch scenarios only wherein there is no need to reset MAC at mobility/switching. Further, we would like to restrict the scenarios to include only intra-frequency inter-cell mobility thus reducing the overhead of RAN2 work in handling the measurement gap configurations/updates.
6	Futurewei Technologies	Q1: We do not see the need to increase or adjust RAN2 TU assignment for feMIMO at this point of time. We should let RAN2 work on the RAN1 LS first and assessment the amount of work needed. In the case that more TU is needed for the relevant work, instead of increasing TU, the scope should be adjusted to fit in the current TU assignment as it is clear that RAN2 is already fully loaded. Q2: We believe the L1/L2 centric inter-cell mobility work, by properly selected use cases and scenarios, can have very limited RAN2 impacts and hence fit into the current TU assignment. We should at this point let RAN2 work to respond to RAN1 and let RAN1 know what is the proper scope considering the current TU assignment.

Item	Company	Comments
7	Guangdong OPPO Mobile Telecom.	Q1: We don't see it is a good time to increase RAN2 TU for FeMIMO. Firstly, RAN2 doesn't start FeMIMO so far, and lacks the full assessment of work load on FeMIMO from RAN2 perspective. The question Q1 itself also reflects the same situation that Secondly, RAN2 is fully loaded and there are some SI-WI conversions. Thus, we prefer not to increase any TU for FeMIMO Q2: RAN2 is planning to have a email discussion for the LS. The scope will be clear once RAN2 has the answer for each question. We can wait for RAN2 output, rather than guessing the scope.
8	NTT DO- COMO INC.	Q1: We think there should be no expansion of Rel.17 FeMIMO WI scope, since current WI scope is too big. Based on this understanding, we agree on adding the TUs in RAN2. Q2: We prefer to keep the scope small in Rel.17, e.g., no SpCell change via L1/L2 signaling, no RRC re-configuration of serving cell configurations via L1/L2 signaling. We can further enhance L1/L2-centric inter-cell mobility in Rel.18.
9	HuaWei Technolo- gies Co., Ltd	Huawei, HiSilicon: Q1: we do not think to increase the TU without clearly understanding of what to be standardized in Rel-17 is the right way forward. The current RAN1 discussion seems quite broad and it is unclear what to be specified. We think we should first wait for the RAN WGs feedback on those questions and understand the exact target for Rel-17, before adding more TUs. Q2: we think to be realistic, the scope should only consider intra-DU and intra-frequency cases to accommodate Rel-17 timeline. On the other hand the LS was already sent from RAN1 to RAN2/RAN3/RAN4, and we think we should allow these RAN WGs to discuss further on the scoping before concluding right now.
10	QUALCOMM JAPAN LLC.	Q1: All in all, it looks difficult at this stage to come to concrete TU allocations only from those questions in the RAN1 LS. It looks better to allow RAN2 to have their discussion in #113bis meeting in April and send an response to the RAN1 LS. This then allows RAN1 to have additional discussion / conclusion on solution direction in #105 meeting in May. We can then revisit the TU business at June plenary. Q2: See above, we suggest that RAN revisit the TU allocation issue after we know more about the solution direction.
11	Samsung Research America	Q1: We are fine with the updated TU allocation. Q2: RAN2 is expected to consider two FeMIMO sub-features, L12XCM (L1/L2 Inter-cell mobility) and mTRP BFD timer. For L12XCM, the scope of the RAN2 work would become more apparent after RAN2 discusses the LS from RAN1. For BFR enhancements for multi-TRP, it has been agreed that TRP-specific BFD timer and counter are supported. The corresponding MAC procedure needs to be specified to operate separate timer/counter per TRP, accordingly additional RAN2 TUs are needed.

Item	Company	Comments
12	LG Electronics Inc.	<p>Q1: We think that it is premature to decide on increasing RAN2 TU for FeMIMO at this moment since the RAN1 LS is still pending. We also sympathize with some other companies' comments that we should be very careful on this issue considering the full load situation of RAN2.</p> <p>Q2: For multi-cell operation, we support Ericsson's suggestion to discuss only those scenarios where there is no UP impact.</p>
13	Samsung Research America	<p>[Mod] I appreciate the comments and understand the difference in views in regard of the need for increasing RAN2 TU allocation for multi-cell BM (which includes L1/L2-centric inter-cell mobility AND inter-cell mTRP - cf. LS R1-2102248). However,</p> <p>1) RP-210291 also mentions the mTRP BFD counter agreement which requires some additional RAN2 work. So far, none of the companies opposing the proposed 'enhancement' :-) in RAN2 TU allocation touch upon this.</p> <p>2) Re the response for LS R1-2102248 (affecting both L1/L2-centric inter-cell mobility and inter-cell mTRP) will undoubtedly occupy significant amount of time in RAN2. Some guidance from the RAN2 chair would be appreciated, e.g. if some TU(s) would be needed in the next RAN2 meeting (RAN2#113bs-e)</p> <p>For better progressing this discussion, I hope opposing companies can address the above two issues as well when considering whether the current RAN2 TU allocation requires some enhancement. Thanks</p>
14	MediaTek Inc.	<p>Q1: We prefer not to allocate additional RAN2 TUs on this topic for the remainder of the Release without RAN2 having identified what should be done first. So the proposal is not acceptable to us.</p> <p>Q2: We should wait for the RAN2 review of the LS, with RAN2 identifying what can be done to fit within the current TU allocation for post-Q2/2021 meetings. Like others we believe that it would be reasonable to keep the scope limited in Rel-17.</p>
15	ZTE Corporation	<p>[ZTE]</p> <p>Q1: We think we should be careful to increase TUs for items. Each item should try to shape the scope to fit in the TU budget. Hence at current stage we cannot agree to increase RAN2 TUs for FeMIMO. But we are okay to shift some of the allocated RAN2 TUs to earlier meetings, so that RAN2 can have an early discussion to decide the scope of L1/L2 centric inter-cell mobility and reply the LS.</p> <p>Re mTRP BFD, we think we should still try to utilize existing RAN2 TUs for it. If there is anything related to better progress in RAN1, to shift some RAN2 TUs to earlier meetings can address the issue.</p> <p>Q2: In general we think it is needed to limit the RAN2 impact of L1/L2 centric mobility to fit in the RAN2 TUs. This general guideline can be given from RAN to RAN2, so that RAN2 can determine the detailed scope in future RAN2 meetings when discussing this LS. This can justify earlier RAN2 TUs for FeMIMO.</p>

Item	Company	Comments
16	Guangdong OPPO Mobile Telecom.	<p>Comment regarding Mod's two issues</p> <p>Issue 1: In the current WID, we have the task for RAN2 "Specify higher layer support of enhancements listed above [RAN2]" in the WID. Thus, the RAN2 TU allocation has considered the potential impacts of RAN1 outputs.</p> <p>Issue 2: In the current version of RAN2 agenda (R2-113bis Agenda v31), RAN2 chair captured the following guidance in Section 8.17: <u><i>LS from RAN1 on Mobility for feMIMO will be opened, discussed further in a Post Meeting email discussion. Goal to have a reply LS from next meeting. In general incoming LSes may be treated.</i></u></p>
17	Intel Corporation (UK) Ltd	<p>Q1: We don't think TU increase in RAN2 is well justified. According to rapporteur SR the WID is on track. If RAN2 finds it difficult to complete the work on time with current TU allocation, it should be reflected in SR. Then RAN plenary can revise TU based on SR input in the next RAN meeting.</p> <p>Q2: The scope of the work should be decided by RAN2 considering the benefits of the corresponding solution and available TU.</p>
18	Nokia Corporation	<p>Q1: The RAN2 chair is already proposing to have 0.5 TU for this topic in May meeting. We think that would be sufficient for handling the LS reply. We shouldn't increase TUs until we know what is needed.</p> <p>Q2: We agree this should wait for WG input: 3GPP history has shown that all mobility-related aspects always become bigger than expected: Looking at the current WI scope, there is a great risk that the L1/L2 mobility work cannot be completed during Rel-17. This of course requires further RAN234 assessment, but it should be ensured that the objectives are focused so that the WGs don't need to do unnecessary work.</p>
19	MediaTek Inc.	<p>R2 chair: The TU allocation in general looks ok. It may be somewhat low to address everything in the LS, but R2 will anyway reply to the LS (a significant portion of R2 meeting resource is for chairman prioritization for high priority things like replying to LSes). If Companies think the LS lead to a lot of impact in R2, the TU allocation can be revisited in June. Note that Even though we might be able adjust TU allocation somewhat in June, I believe that R17 doesn't have enough spare TUs / remaining meetings to start development of any completely new mobility procedure. I assume RAN2 need to assume in R17 that existing procedures are used (with some modification if needed). On a practical note I am worried about misunderstandings RAN1 - RAN2 due to potentially unclear responsibility split, so indeed to me the discussion on this LS is a high priority one.</p>
20	Beijing Xiaomi Mobile Software	<p>[Xiaomi]</p> <p>Q1: We are fine with the proposed timeline and TU update.</p> <p>Q2: The RAN2 work scope will depend on the answer to the questions in the LS. The exact RAN2 work scope discussion can wait a bit until the next RAN-P. But we agree that RAN2 workload may be high.</p>

Item	Company	Comments
21	Samsung Research America	<p>[Mod] Thanks for the comments especially from the RAN2 chair.</p> <p>Q1. Although RAN2 chair has indicated that the proposed enhancement on TU allocation is fine, some companies voiced some concern on adding more TUs. But starting the discussion on FeMIMO early doesn't seem to be an issue - at least for the response to the LS R1-2102248.</p> <p>Question to RAN2 chair: do we need to allocate 0.5 TU for RAN2#113bis (April meeting, not May)? Is this 0,5 TU in addition to the total of 2.5 TUs already allocated to RAN2 for FeMIMO?</p> <p>Q2. I sympathize with the comments stating that it is better to wait until RAN2 responds to the LS R1-2102248. However, the comments are relevant only for inter-cell beam management (L1/L2-centric inter-cell mobility and inter-cell mTRP). As mentioned, RAN1 agreement on mTRP BFD timer may need additional RAN2 work (MAC CE). This may warrant some additional TUs.</p>

Moderator's observation:

1) Given the effort required to prepare a response to LS R1-2102248, RAN2 chairman (in RAN2 status report) has proposed to allocate 0.5 TU in RAN2#114-e (2021/05).

From rapporteur's perspective, however, since RAN1 expects the RAN2 response to the LS by RAN1#105-e (2021/05) to avoid extended delay, it may be more fitting to allocate the 0.5 TU for RN2#113bis-e (2021/04).

2) 7 companies supported the above proposed RAN2 timeline (starting @RAN2#114-e, adding 2 meetings and 2 more TUs) with the RAN2 chair expressing his consent. But 9 (opposing) companies stated that it is either premature or unnecessary to increase # TUs in RAN2 - at least before a RAN2 response to LS R1-2102248 is finalized. However, the agreement on mTRP BFD timer/counter (which may requires additional RAN2 attention/work) hasn't been sufficiently engaged by the opposing companies.

3) Out of the 9 opposing companies, 1 company (ZTE) stated that starting the RAN2 work earlier is acceptable.

3 Intermediate round 1

Given that: 1) RAN1 expects RAN2 response to LS R1-2102248 by RAN1#105-e (2021/05) to avoid extended delay (RAN2 response is required to proceed in inter-cell beam management/mTRP), 2) It is beneficial to start FeMIMO work/discussion in RAN2 earlier, 3) mTRP BFD timer/counter requires some additional MAC CE work

Companies are requested to share their views on the following **moderator proposals:**

P1: To prepare the response to LS R1-2102248, allocate the 0.5 TU proposed by the RAN2 chair for RAN2#113bis-e

P2: In addition to P1, shift the additional RAN2 timeline by 1 meeting earlier, i.e. spanning from RAN2#114-e (2021/05) to RAN2#116 (2021/11).

P3: Add more TUs to accommodate the additional MAC CE work for mTRP BFD timer/counter. The number of additional TUs is TBD.

P4: Revisit the need for more TUs in RAN#92-e (2021/06) to address inter-cell issues based on the outcome of RAN1#105-e after receiving RAN2 response to LS R1-2102248.

Feedback Form 2: Companies' views on P1, P2, P3, and P4

Item	Company	Comments
1	Samsung Research America	[Mod] Please share your views on P1, P2, P3, and P4. Thanks.
2	Intel Corporation (UK) Ltd	P1: OK. We can follow RAN2 chair recommendation. P2: OK. We can follow RAN2 chair recommendation. P3: Not OK. This objective (along others with RAN2 impact) should be handled as part of the existing TUs planned in WID. Depending on the progress in RAN2, additional TUs may be requested in the next RAN plenary meeting. P4: Not OK. It is not clear whether revision to TU allocation is needed or not at this stage. Suggest to discuss this issue based on SR to RAN#92-e taking into account actual progress in all WGs.
3	Apple GmbH	P1: Okay P2: Okay P3: Okay P4: Okay
4	Nokia Corporation	These proposal are not acceptable to us as they are. P1/2: This is not a compromise at all - just what rapporteur originally proposed, thinly disguised. RAN2 chair status report originally proposed 0.5 TU for RAN2#114, NOT for RAN2#113bis-e. As there were several companies who questioned the need for TU changes, we think at best the TUs should start from RAN2#114. Hence, we do not agree to this and think the TUs should be allocated for RAN2#114 instead. P3: It is not at all clear 1) How many TUs are requested, 2) in which WG TUs are needed (we presume it's both RAN1 and RAN2, but could also mean RAN4) and 3) where do these TUs would come from, i.e. what else is not done due to increase in TUs? P4: We think both the WI scope and the TUs should be revisited in RAN#92e based on the LS replies from RAN2, RAN3 and/or RAN4. It's important to understand what can be done Rel-17 timeframe once the WG feedback is available.
5	Futurewei Technologies	We do not agree with P1/2/3 as stated in our previous comments. As also as we commented in initial round, the WI scope and the needed TUs should be revisited in RAN#92 based on RAN2 work on the LS replies.
6	vivo Communication Technology	On P1, RAN2 will treat LS, in our view it is up to RAN2 chair's discretion how to handle. On P2, it depends on overall RAN2 workload and TU budget On P3, P4, given Rel-17 completion date based on WI progress, WI scope and TU can be discussed in RAN#92e

Item	Company	Comments
7	ZTE Corporation	<p>P1/P2: Need refinement</p> <p>We are okay to shift some of the allocated TUs to earlier meetings, but we should keep the already existed TUs in the last two meetings (i.e., the last 0.5 and 1 TUs) unchanged to solve issues like RRC parameters when RAN1 is about to finish its normative work. We can shift the first 0.5 and 0.5 TUs to earlier meetings to address the request of replying the LS and discussing early issues in mTRP BFD, while keep the total number of TUs unchanged across Rel-17. We think the 0.5 TUs to discuss the RAN1 LS should come from the shifted ones.</p> <p>P3: Not okay</p> <p>We don't think we can agree on the proposal now without a clear picture on the amount of RAN2 work.</p> <p>P4:</p> <p>If we shift the TUs to earlier meetings, it seems not needed to revisit TU allocation again. We only needs to discuss the scope to fit in the allocated TUs. If we cannot agree to shift the TUs, we can revisit both TU allocation and scope of FeMIMO RAN2 work in next RAN#92.</p>
8	Samsung Research America	<p>[Mod] The RAN2 chair just informed that the proposal to have 0.5TU for FeMIMO in RAN2#114-e cannot be reallocated to RAN2#113bis-e.</p> <p>In this case:</p> <ul style="list-style-type: none"> • P1 doesn't need to be discussed further (the answer is no) • P2 is already aligned with the proposal from the RAN2 chair (0.5TU in RAN2#114-e). Therefore it is left to the discretion of the RAN2 chair <p>P3 and P4 are still open for discussion.</p>
9	QUALCOMM JAPAN LLC.	<p>We are fine as long as RAN2 is facilitated to discuss and reply to the RAN1 LS in #113bis-e meeting, regardless of adding RAN2 TU or not. On TU allocation for other meetings, we believe it can be left to discussion at RAN#92e.</p>
10	Samsung Research America	<p>P3: Support. It has been agreed in RAN1 that TRP-specific BFD timer and counter are supported. The corresponding MAC procedure needs to be specified to operate separate timer/counter per TRP, accordingly additional RAN2 TUs are needed.</p> <p>P4: Support. Agree to discuss if additional RAN2 TUs are needed after RAN2 has looked at the LS and scoped the RAN2 effort.</p>
11	Guangdong OPPO Mobile Telecom.	<p>P3: NO. We failed understand why m-TRP BFD counter/timer introduced additional RAN2 work on top of the current WID. The WID has the task " Specify higher layer support of enhancements listed above [RAN2]" , which already includes the RAN2 work for m-TRP BFD. Would some of the propoents like to clarify why addtional RAN2 work is needed?</p> <p>P4: No need to have such kind of agreement/conclusion at this meeting. Let's wait for the output of RAN2 work on the LS and then decide what we can do, e.g., refinement of scope, adjustment of TU allocation.</p>

Item	Company	Comments
12	LG Electronics Inc.	<p>P3: We sympathize with the intention of this proposal. Recalling Rel-16 BFR, RAN2 requires some time to discuss details such as SR and BFD procedure, MAC-CE details, but the issue is that the required amount of TU for this work is unclear at this moment. One possibility is to make a detailed decision within RAN1 as much as possible so that RAN2 can work on those within the current TU. Shifting 0.5 TU for one earlier meeting may also be fine.</p> <p>P4: This can be discussed in RAN#92e depending on the outcome of the LS, if needed. We feel that it is unnecessary to make a conclusion on P4 in this meeting.</p>
13	HuaWei Technologies Co., Ltd	<p>Huawei, HiSilicon: We don't think we need to discuss or decide these proposals here anymore. RAN2 chair has already planned 0.5 TU for RAN2#114 to treat the LS. It is premature to discuss TU extensions before RAN WGs reach consensus on what to be specified.</p>
14	CATT	<p>P3: Given the RAN1 agreement to extend the timer/counter to per-TRP , we are fine to consider slightly increasing the TU, value TBD.</p> <p>P4: Support to revisit the TU allocation after RAN2 responds to the LS.</p>
15	MediaTek Inc.	<p>P1: Thought this was already proposed by RAN2 chair. So this proposal seems unnecessary.</p> <p>P2: Assume there was a reason for the current allocation and timing. Unless we are planning to close Rel-17 earlier we don't see the justification for bringing this forward. And at least the L1/L2 mobility likely needs to wait until June plenary for a good coordination between groups before rushing ahead. So object to this proposal.</p> <p>P3: Agree with OPPO comments. RAN2 has actually already some TUs allocated for the MIMO work item in Rel-17. So no need to ask for more TUs every time RAN1 makes a specific agreement that requires some RAN2 work. So object to this proposal.</p> <p>P4: It is business as usual process to review the status of all ongoing WI/SI including project scope and TU allocation at each plenary. Until RAN2 has discussed this we are not sure what plenary is supposed to discuss. Like every other item let's see where we are in June and decide if there is any action needed and what that may be. So we object to this proposal.</p>
16	MediaTek Inc.	<p>P1: Following up...so your proposal is misleading because it suggested that the RAN2 chair has already agreed to a 0.5 TU in RAN2#113b-e. If this is not the case, then please clarify that this is not the case. We prefer to keep what the RAN2 chair has proposed and object to anything different.</p>
17	Ericsson LM	<p>P1-P2: Our understanding from the previous comments is that these two proposals are no longer valid or up for discussion.</p> <p>P3: This topic is quite complex and requires coordination between RAN1 and RAN2. Additional TUs would be very beneficial to secure the success of MIMO.</p> <p>P4: We are positive to further discussions at a later RAN plenary when more information is available, e.g. on the amount of work needed in RAN2.</p>

Item	Company	Comments
18	Beijing Xiaomi Mobile Software	Xiaomi: P3 & P4: We are fine with the proposals.
19	Samsung Research America	Re comment #16 from MediaTek, check my follow up comment #8 (already clarified), also check my email on reflector (asking the RAN2 chair re P1/P2). Even in the previous form of P1 (with the observation) nowhere did the moderator suggest that P1 was already agreed. Otherwise, there wouldn't be any need for proposing.
20	Samsung Research America	[Mod] Note that comment #19 is strictly from the moderator

Moderator's observation:

1. Per RAN2 chair discretion, 0.5TU in RAN2#114-e has already been proposed for FeMIMO and no TU can be added in RAN2#113bis-e.

2. Re adding more TUs for mTRP BFD counter MAC CE work (P3), 5 companies expressed support while 8 companies are against - at least in RAN#91-e (arguing that, e.g. the current allocated TUs should be sufficient and any additional work should be 'pushed' into the allocated TUs, or reassessment in RAN#92-e depending on the SR).

Therefore, there is no consensus in adding more TUs for mTRP BFD counter in RAN#91-e.

3. Revisiting the need for more TUs in RAN#92-e (2021/06) to address inter-cell issues based on the outcome of RAN1#105-e after receiving RAN2 response to LS R1-2102248 (and the progress level in RAN#92-e SR) seems natural anyway. It can be done without any present agreement/conclusion.

Moderator's conclusion:

On the scope of Rel-17 FeMIMO WI as discussed in RAN#91-e: Based on the current status (reflected in SR RP-210290), other than the 0.5 TU in RAN2#114-e already proposed by the RAN2 chair, there is no consensus in applying other modification to the current RAN2 TU allocation for Rel-17 FeMIMO WI.

4 Conclusion

Based on the questions and inputs in the initial and intermediate rounds, the discussion can be finalized with the following conclusion:

Conclusion:

On the scope of Rel-17 FeMIMO WI as discussed in RAN#91-e: Based on the current status (reflected in SR RP-210290), other than the 0.5 TU in RAN2#114-e already proposed by the RAN2 chair, there is no consensus in applying other modification to the current RAN2 TU allocation for Rel-17 FeMIMO WI.