[98e-20-R18-MobilityEnh] - Version 0.0.5

RAN

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3GPP TSG RAN Meeting#98-e RP-223460

Electronic Meeting, December 12th – 16th 2022

Source: MediaTek Inc. (Moderator)

Title: Moderator's summary for discussion [98e-20-R18-MobilityEnh]

Agenda Item: 9.3.2.1

Document for: Report

1 Introduction

This email discussion is scheduled into Initial, Intermediate, Final (and if required Extended) rounds, as per the timeplan provided by the RAN Chairman, in ***UTC time*** as follows.

Table 1: RAN Email discussion timeplan

Initial Round (*Quiet period*)	**Mon 8am - Tue 12noon** (*1- 4pm*)	Moderator WF @3.30pm
Intermediate Round	**Tue 3.30pm - Wed 11am**	Moderator WF @11.59am
Final Round(*Quiet period*)	**Wed 3.30pm - Thu 12noon** *(12noon- 4pm)*	Moderator WF @3.30pm
Extended Round	**Thu 3.30pm - Fri 11am**	Moderator WF @11.59am

The aim of this email discussion is to discuss and agree (if needed) on a revised WID for Mobility Enhancements, according to the two following points:

1. At RAN#97e, the WID was revised and approved in RP-222332. The following was also agreed:
    - "*avoiding an unnecessary MN-to-target-SN-RTT for cases when the source SN config changes that does not impact the target SN config.*" - can be discussed in RAN3. If needed, the WID can be further updated in RAN#98e.
2. The obj#7 of the WID is targeted for completion at RAN#98

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If necessary interim draft revisions of the WID [4] will be stored in the inbox/Drafts/[98e-20-R18-MobilityEnh] folder.

Documents subject to this email discussion are listed hereafter:

Table 2: TDocs subject to email discussion

TDoc	Title	Source	Proposal

[1] RP-222727	LS on improvement in FR2 SCell/SCG setup/resume delay (R4-2220734; to: RAN; cc: -; contact: MediaTek)	RAN4	RAN4 progress on Obj#7:
			• Enh. on UE behavior in IDLE/INACTIVE mode are not in scope
			• The following aspects can be *further studied*
			  ◦ Using meas. results obtained during IDLE/ INACTIVE mode for meas. during RRC conn. proc.
			  ◦ Note: enh. on IDLE/INACTIVE mode meas. are not in the scope

[2] RP-222912	Improved FR2 SCell/SCG setup delay	Nokia, Nokia Shanghai Bell	**P1:** Obj#7 moved to normative work phase starting from RAN#98e onward. **P2:** Revise Obj#7 to specify mechanism, procedures, and requirements for improving FR2 SCell/SCG setup delay as RAN4 led and RAN2 work triggered once RAN4 has progressed far enough: To specify mechanism, procedures, and requirements to achieve improved FR2 SCell/SCG setup delay according to [RAN4, RAN2]: • Define UE requirements for improving FR2 SCell/SCG measurements without measurement gaps at MO or MT RRC setup/resume initiation from idle/inactive mode [RAN4]. • Specify network configuration, UE procedures and subsequent UE measurement reporting for the improved FR2 SCell/SCG measurements to support SCell/SCG setup in CONNECTED based on RAN4 solution [RAN2] • Define UE measurement delay and accuracy requirements for the improved FR2 SCell/SCG measurements and reporting [RAN4] • NOTE1: Mea-

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[3] RP-223103	Discussion on scope of Rel-18 further mobility enhancement WI	Vivo	**P0:** Obj#7 moved to normative phase **P1:** Defining new UE measurement procedures and RRM core requirements for improvement in FR2 SCell/SCG setup delay during RRC connection setup procedure under following sequence of events. • UE initiates and performs improved measurement when it is aware of RRC connection setup/resume • UE uses measurement results obtained during IDLE/INACTIVE mode for further improved measurements • After acquiring those improved measurements, the UE subsequently reports those measurements to the network to support SCell/SCG setup **P2:** Not to enhance measurement requirements and procedures on UE behavior in IDLE/INACTIVE mode measurements

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[4] RP-223236	Revised WI NR mobility Enhancements	Rapporteur (MediaTek Inc., Apple)	**Obj#3:** To specify data forwarding optimizations and study the avoidance of unnecessary signaling between MN and the target SN for CHO including target MCG and target SCG in NR-DC [RAN3]. **Obj#7** (Replaced by)**:** 1. Further study how to reuse the IDLE/INACTIVE mode measurement results which are to be reported during RRC connection setup/resume: ○ Conclude the mechanism by RAN#99 meeting and introduce the corresponding UE requirements, if identified [RAN4] • Note: Enhancements on IDLE/INACTIVE mode measurements are not in the scope

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[5] RP-223237	Motivation for revised WI: Further NR mobility enhancements	Rapporteur (MediaTek Inc., Apple)	**P1:** Revise Objective 3 to "To specify data forwarding optimizations and study the avoidance of unnecessary signalling between MN and the target SN for CHO including target MCG and target SCG in NR-DC". **P2:** Revise Objective 7 to • Further study how to reuse the IDLE/INACTIVE mode measurement results which are to be reported during RRC connection setup/resume ○ Conclude the mechanism by RAN#99 meeting and introduce the corresponding UE requirements, if identified [RAN4] • Note: Enhancements on IDLE/INACTIVE mode measurements are not in the scope

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[6] RP-223282	Discussion on Rel-18 Further NR Mobility Enhancements	Ericsson	**P1:** Obj#7
			• Study and specify the enhancements to IDLE/IN-ACTIVE mode measurements by considering at least the following.
			  ○ Study and specify validity of IDLE/IN-ACTIVE mode measurement results which are to be reported during RRC connection setup/resume [RAN4]:
			  ▪ Using measurement results obtained during IDLE/INACTIVE mode and measurements during RRC connection procedure to obtain valid and reliable measurement

[7] RP-223285	Discussion on Further NR mobility enhancements for CHO and NR-DC	Ericsson, Lenovo, Qualcomm Incorporated, ZTE, CATT	**P1:** Obj#3 To specify data forwarding optimizations and how to avoid unnecessary signaling exchange between MN and target SN for CHO including target MCG and target SCG in NR-DC [RAN3].

2 Initial Round

2.1 Objective #3

TDocs [4], [7] discuss objective #3 but make two different proposals:

- [4] To specify data forwarding optimizations and study the avoidance of unnecessary signaling between MN and the target SN for CHO including target MCG and target SCG in NR-DC [RAN3].
- [7] To specify data forwarding optimizations and how to avoid unnecessary signaling exchange between MN and target SN for CHO including target MCG and target SCG in NR-DC [RAN3].

Although the Status Report RP-223235 on this WID is not part of this email discussion, it should be noted that the latest status from RAN3#118e/Nov 2022 (as quoted in the SR) indicates acknowledgement of the issue discussed at RAN#97e and that the corresponding solution is FFS:

- RAN3 acknowledges unnecessary signaling exchange between MN and the target SN would cause inefficiency and extra latency for CHO + NR-DC, the solution is FFS.

[4] states that ”However, FFS on the solution implies that there was no consensus in RAN3 on whether a solution is needed and what the solution will be.” [7] proposes to specify a solution whilst highlighting ”in total five solutions have been proposed and summarized in R3-226876. Among them, 3 solutions have standard impacts, while another one proposes to use SRB3. The fifth solution proposes to do nothing.”

Given the above the moderator observes that while the problem is acknowledged by RAN3, a solution to the problem is yet to be decided incl. whether this will need to be specified. In view of this, the moderator proposes to reflect this in Obj#3:

Moderator Proposal 1: Update Obj#3 as follows:

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- ~~To specify data forwarding optimizations for~~ For CHO including target MCG and target SCG in NR-DC [RAN3]:
  - to specify data forwarding optimizations; and
  - to study and specify, if needed, a solution to avoid unnecessary signaling exchange between MN and target SN.

The moderator invites companies to provide comments on Moderator Proposal 1 as well as any other comment regarding the issue.

Feedback Form 1: Initial Round: Objective #3

1 – Ericsson LM

Please note that proposal in RP-223285 is supported by Ericsson, Lenovo, Qualcomm Incorporated, ZTE, CATT. These companies, together with the others in RAN3 have already studied the topic for a few meetings. Thus the wording to "study" in the above proposal does not reflect the situation. We propose two alternatives:

o Alternative 1: to specify a solution to avoid unnecessary signaling exchange between MN and target SN.

o Alternative 2: to down select candidate solutions to avoid unnecessary signaling exchange between MN and target SN.

2 – Qualcomm Incorporated

we have same view as Ericsson commented. RAN3 already studied 5 potential solutions and need to identify one solution to resolve it.

3 – T-Mobile USA Inc.

We support Ericsson's proposed alternative 2 "to down select candidate solutions to avoid unnecessary signaling exchange between MN and target SN."

4 – MediaTek Inc.

The wording "study" was used in the proposed WID revision, because some companies might think no solution needs to be specified. If now all companies think there will be a solution specified, we can simply remove "study".

5 – Nokia

We agree with the proposed text from the moderator, since there is currently no common understanding in RAN3 whether a solution can fully avoid unnecessary signalling exchange, and whether specification impacts are justified (or even needed, e.g. one of the 5 solutions mentioned by Qualcomm avoids specification impact).

6 – Samsung Electronics Co.

We support the proposal from the rapporteur which looks reasonable to us. Indeed, the current discussion in the WG does not indicate there should be an enhancement finally so 'if needed' can be added, as in the proposal.

7 – Spreadtrum Communications

We think the wording"study" is suitable, though some dicussion and progress have been made by RAN3, no common underatanding has be obtained till now.

8 – CATT

As we all know that RAN3 already discuss on solutions for this issue,we think it is not proper to mention study in the objective.Maybe we could adopt alternative 2 propsoed by E/// as a compromised wording which also consistent with current situation in RAN3.

9 – Qualcomm Incorporated

To make progress, we are fine with Alt2 suggested by Ericsson.

10 – Transsion Holdings

We agree with moderator's proposal, which can be a start point with "study".

11 – China Telecom Corporation Ltd.

We agree with moderator's proposal1.

12 – HuaWei Technologies Co.

We support moderator's proposal 1. The candidate solutions need further study to figure out whether there is any specification impact, and thus it is premature to say we already need specify sth.

13 – Beijing Xiaomi Mobile Software

we support moderator's proposal 1

14 – Verizon UK Ltd

We support moderator's proposal-1 to update objective#3.

15 – LG Electronics Polska

We are okay with Moderator Proposal 1.

16 – Futurewei

We agree, in principle, with the Moderator's proposal 1, except that the second sub-bullet from the Moderator's proposal 1 sounds like even the study is done only if needed. We propose the following editorial change to get the meaning precise:

- to study and ~~specify~~, if needed, specify a solution to avoid unnecessary signaling exchange between MN and target SN.

17 – vivo Mobile Communication (S)

We support moderator's proposal, as the corresonding solution needs further study and discussion.

18 – Apple Poland Sp. z.o.o.

We support moderator's proposal.

It is true that RAN3 studied this issue with candidate solutions. It is also true there was no conclusion/-consensus made yet in RAN3 to go with a particular candidate solution. For some candidate solution, no spec impact is foreseen even. Therefore, as business usual, we need to continue the study and moderator's proposal seems well reflecting the current status in our observation.

19 – VODAFONE Group Plc

We support the moderator's proposals. "to study and specify" is ok as the discussion in RAN3 is yet to be concluded.

20 – Intel Corporation (UK) Ltd

We also didn't see a need to revise the objective 3 given RAN3 already acknowledged the issue. But reading the moderator's summary, we agree with the moderator's observation and we are OK with the moderator's proposal.

21 – ZTE Corporation

We share the same view as Ericsson and Qualcomm and prefer Ericsson's alternative 2.

2.2 Objective #7

The moderator proposes to note document [1] (LS from RAN4)

Moderator Proposal 2: RP-222727 [1] is noted

As per [1], RAN4 agrees the following is *not in scope* of the work in RAN4:

- Enhancements of UE behavior in IDLE/INACTIVE mode
- Enhancements on IDLE/INACTIVE mode measurements

The moderator assumes the above will need to be indicated in a revision of the WID.

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As per [1], RAN4 agrees the following can be further studied:

- Using measurement results obtained during IDLE/ INACTIVE mode for measurements during RRC connection procedure

Besides the agreement mentioned above, it can be noted that RAN4#105/Nov 2022 R4-2220415 also highlights a way forward (aka ”next step in later meeting”) on the issue of availability and validation of measurement results obtained during IDLE/INACTIVE mode as shown below:

- ”<Wayforward>: companies are encouraged to *further study whether and how* to use measurement results obtained during IDLE/INACTIVE mode. The following proposals from companies in RAN4#105 can be considered as reference for further discussion. *[... followed by a list of 8 proposals P1 ~ P8 ...]* ”

TDocs [2], [3], [5], [6] discuss objective #7.

- [2], [3] propose to move Obj#7 to normative work while [5], [6] propose to continue the study work in RAN4.
- All TDocs [2], [3], [5], [6] propose to update Obj#7 with differing degrees of details esp. pertaining to company proposals P1~P8 in R4-2220415.

In view of the above, the moderator recommends that the WID be updated

- to reflect the agreements made by RAN4 [1]
    - on what is not in scope; and
    - to continue the study work; and
- to specify (if concluded in RAN4) the results of this study work.

The moderator does see the proposal from the Rapporteur [4] is a balanced proposal that implements the minimum required changes at this plenary to accommodate the above, whilst also aiming at a RAN4 conclusion in Q1 2023 on the study part that can lead way to normative work. The moderator suggests to take [4] as baseline for updating Objective #7 in this meeting.

Moderator Proposal 3:

- To take the Rapporteur proposal [4] as baseline for updating Objective #7 in this RAN#98e meeting

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Companies are invited to provide their comments on Moderator Proposal 3 and whether anything additional/else should be documented in the WID revision, in view of [2], [3], [6].

Feedback Form 2: Initial Round: Objective #7

1 – Beijing Xiaomi Mobile Software

we support moderator's proposal 3

2 – Ericsson LM

We do NOT support moderator's proposal 3. RAN4 has spent several meetings to converge on the WF. No more feasibility/study is needed. RAN4 should start the normative part from Feb meeting.

We also have concern that moderator has completely ignored other proposals in [2], [3] and [6], on starting the normative part. Secondly, [2] and [6], have suggested to include RAN2 whose impact depends on RAN4 outcome. But moderator has not included this even for any discussion,

3 – MediaTek Inc.

Moderator comment:

- Responding to Ericsson - as proposed this is a baseline for discussion with a clear indication "Companies are invited to provide their comments on Moderator Proposal 3 and **whether anything additional/else should be documented in the WID revision, in view of [2], [3], [6].**" - i.e. nothing has been ignored in the proposal. Thanks!
- Note I may have been confused with the wording of your proposal that clearly states twice "Study and specify" while you now say "no more study is needed" - please clarify your proposal, at least for the sake of this email discussion so we are all on the same page. Thanks!

4 – Nokia Corporation

We have similar view as Ericsson. We do not support the moderator's proposal as RAN4 has now completed the study phase and therefore, RAN4 should move to normative phase with clear RAN4-led objectives to start requirement development and define needed signalling support with help of RAN2.

5 – Apple Hungary Kft.

We support the moderator's proposal 3. A Way-forward does not mean the RAN4 has completed, and so the moderator's proposal-3 seems to be good balance.

6 – InterDigital

We have a similar view as Ericsson and Nokia, and do not support the moderator's proposal. While we acknowledge that there are some open issues from RAN4 perspective, solution feasibility has been concluded and the open issues can be addressed during the normative phase without the need to extend the study. We also think the objective should be RAN4 led with support from RAN2.

7 – MediaTek Inc.

We support moderator's Proposal 3. The LS [1] states that "the following can be further studied", also in the way-forward (R4-2220415) we see "companies are encouraged to further study **whether and how** to use measurement results obtained during IDLE/INACTIVE mode." Our reading is that while RAN4 has chosen the direction to use measurement results obtained during IDLE/INACTIVE mode in RRC connection procedure, there are different ways to do this. Therefore, further study is needed for RAN4 to down-select their solution, and then enter normative phase to discuss the details and requirements.

8 – Guangdong OPPO Mobile Telecom.

we Support not to enhance measurement requirements and procedures on UE behavior in IDLE/INACTIVE mode measurements. As compromise, RAN4 can continue the study for one more meeting and conclude the mechanism by RAN#99 meeting

9 – Samsung Electronics Co.

We support the Proposal 3 from the moderator which is aligned with the latest agreement in RAN4.

10 – CATT

We are fine with the moderator's propsoal 3

11 – Spreadtrum Communications

We support the moderator's proposal 3 and take RAN4's agreements into consideration for updating the description.

12 – HuaWei Technologies Co.

We support the moderator's proposal 3 which is well aligned with RAN4 status. In the RAN4 WF it is clearly stated that "companies are encouraged to further study whether and how to use measurement results obtained during IDLE/INACTIVE mode. The following proposals from companies in RAN4#105 can be considered as reference for further discussion." This already shows that a further study is needed for RAN4.

13 – Transsion Holdings

We are ok with this proposal 3.

14 – Futurewei

We are OK with the Moderator's Proposal 3.

15 – Verizon UK Ltd

We share the same view with Nokia and Ericsson.

16 – China Telecom Corporation Ltd.

We support moderator's proposal 3.

17 – vivo Mobile Communication (S)

Firstly, the performance gain of the enhancement is obvious. The IDLE/INACTIVE mode measurement results may not be valid anymore if the time between T331 expires and UE reports measurement results is too long. If the inaccurate results are reported and network configures SCell/PSCell based on the results, it would lead to SCell addition(activation)/PSCell addition failures, which will consume both network and UE resources and lead to bad user experience if large data transmission/reception is needed for the UE when it enters CONNECTED mode. The enhancement of measurements during RRC connection procedure is to ensure the reported IDLE/INACTIVE mode measurement results are up to date.

We think RAN4 concluded the feasibility to certain level and it should be fine to go directly to normative work phase. We are also fine to use rapporteur's WID revision as baseline to revise the objective with following updates.

Further study and introduce the corresponding UE requirements and procedures, if identified, on how to use the IDLE/INACTIVE mode measurement results which are to be reported during RRC connection setup/resume [RAN4, RAN2]

• The UE initiates and performs improved measurements when it is aware of RRC connection setup/resume.

• UE uses measurement results obtained during IDLE/INACTIVE mode for the improved measurements

• After acquiring those improved measurements, the UE subsequently reports those measurements to the network to support SCell/SCG setup.

Note: Enhancements on IDLE/INACTIVE mode measurements are not in the scope

18 – QUALCOMM JAPAN LLC.

We are fine to let RAN4 start the normative work. It should indeed be supported by RAN2 eventually, but more design details will be needed for RAN2 to be able to start their work, e.g. the choice of higher layer signalling used for measurement reporting depends on when the measurement results from lower layer are supposed to be available during or after RRC connection establishment / resume procedure.

The following note can be confusing becasue strickly speaking, the UE is still in IDLE/INACTIVE state during RRC connection establishment / resume procedure until it receives RRC Setup / RRC Resume. So it is still IDLE/INACTIVE mode measurement if the measurement is performed after the initiation of RRC connection establishment / resume procedure and before the reception of network response message.

- **Note: Enhancements on IDLE/INACTIVE mode measurements are not in the scope**

19 – LG Electronics UK

Since the planned study phase has been completed, we think normative phase can be started based on agreement in RAN4 #105. We also think this objective should be led by RAN4, and the impact on RAN2 should be minimized. RAN2 is sufficient to get involved only if it is deemed necessary after RAN4 progress sufficiently at normative phase, i.e., there is no need to include RAN2 at this moment. In other words, UE behaviors and requirements for using measurement results in IDLE/INACTIVE mode should be limited to RAN4 work. It is not precluded sending LS to request help of RAN2, if necessary.

20 – Intel Corporation (UK) Ltd

The proposal from the moderator is generally fine for us. Same time, we do not see a strong need to put specific deadlines to conclude on the mechanism and prefer to remove it. In addition, we suggest a small rewording to clarify the purpose of enhancements, add RAN4 as the responsible WG as follows

- *Further study and, if needed, introduce RRM requirements to reuse the IDLE/INACTIVE mode measurement results during RRC connection setup/resume to improve SCell/SCG setup delay [RAN4]*

- *Note: Enhancements on IDLE/INACTIVE mode measurements are not in the scope*

Finally, we anticipate some possible RAN2 involvement depending on the scope of enhancement. The respective RAN2 work can be clarified at a later stage and triggered by RAN4 LS.

21 – ZTE Corporation

We are generally fine with the moderator's proposal, with the amendments suggested by Intel.

2.3 Summary from Initial Round

2.3.1 Objective #3

The moderator had made the following proposal:

Moderator Proposal 1: Update Obj#3

- ~~To specify data forwarding optimizations for~~For CHO including target MCG and target SCG in NR-DC [RAN3]:
  - to specify data forwarding optimizations; and
  - to study and specify, if needed, a solution to avoid unnecessary signaling exchange between MN and target SN

Twenty (20) companies commented on Moderator Proposal 1.

One company suggested two alternatives:

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- Alt1: to specify a solution to avoid unnecessary signaling exchange between MN and target SN
- Alt2: to downselect candidate solutions to avoid unnecessary signaling exchange between MN and target SN

Five (5) companies supported Alt2.

Fiften (15) companies supported Moderator Proposal 1, incl. one company also proposing a minor rewording to avoid confusion.

It is apparent from the discussion that RAN3 has identified a number of solutions and that "study" could be interpreted as inviting new solutions – which would preferably be avoided. It is also apparent from the discussion that further discussion in RAN3 is necessary to reach a conclusion (which may or may not lead to specification work). In view of this, and although a large majority supported the Moderator Proposal, the moderator would like to propose the following *amendment*:

Moderator Proposal 4: Update Obj#3 as follows

- ~~To specify data forwarding optimizations for~~For CHO including target MCG and target SCG in NR-DC [RAN3]:
    - to specify data forwarding optimizations; and
    - to *downselect* and, if needed, specify a solution to avoid unnecessary signaling exchange between MN and target SN.

NOTE: the moderator updated the source for [7] according to the comment made by Ericsson.

2.3.2 Objective #7

DECISION: Moderator Proposal 2 is agreed i.e. RP-222727 [1] is noted.

The moderator had made the following proposal:

- Moderator Proposal 3:
    - To take the Rapporteur proposal RP-223236 [4] as baseline for updating Objective #7 in this RAN#98e meeting

The moderator invited comments on this proposal and whether anything additional/else should be documented in the WID revision in view of inputs in RP-222912 [2], RP-223103 [3], RP-223282 [6].

Twenty (20) companies commented on Moderator Proposal 3.

- One (1) company disagreed with Moderator Proposal 3, indicating no more feasibility/study is needed in RAN4 (although making a proposal stating explicitly "*Study* and specify"). The same company also indicated RAN2 will be involved resulting from RAN4 work. Three (3) companies agreed with this one company.
- One company (1) suggested a detailed revision of Moderator Proposal 3, towards RP-223103 [3]
- One company (1) suggested to continue RAN4 study / or start normative work
- One (1) company supported starting normative work in RAN4, and eventually involving RAN2 (once design details are clear for RAN2 to proceed). This company also indicated that "Enhancements on IDLE/INACTIVE mode measurements are not in the scope" could be confusing.
- One (1) company supported starting normative work in RAN4 based on RAN4#105 agreement, and eventually involving RAN2 (LS)
- Twelve (12) companies supported Moderator Proposal 3. Two (2) companies supported a small rewording, as well as involving RAN2 (LS) later in the work.

It is clear from the discussion that RAN4 should continue work according to the progress they have made until now, and their approved Way Forward in R4-2220415. Companies expressed different views whether more study was needed in RAN4 or if normative work could start immediately. The Moderator however remains somewhat puzzled with the statements made of no more "feasibility/study" when RAN4 in their LS and in their RAN4-approved way forward *explicitly* referred to more "study(ies)" – even if feasibility were understood, some study would seem to be outstanding. However there may be some worry that work would not proceed – which according to the feedback received in the initial round is clearly not the intention.

It is also clear from the discussion that RAN2 would need to be involved in due course, whether by LS or otherwise.

In view of the above, the Moderator would therefore like to propose the following:

Moderator Proposal 5: revise Obj#7 to (all new text):

- To study and specify how to reuse the IDLE/INACTIVE mode measurement results which are to be reported during RRC connection setup/resume in order to improve SCell/SCG setup delay [RAN4, RAN2], incl.
    - Availability and validation of the IDLE/INACTIVE mode measurement results to be reported [RAN4]; and
    - Definition of corresponding RRM requirements [RAN4]; and
    - Definition of corresponding signaling support [RAN2].
        - NOTE 1: RAN4 will coordinate in due course with RAN2 to start the work.
    - NOTE 2: R4-2220415 serves as baseline for future work in RAN4
    - NOTE 3: With exception of the above scenarios, enhancements on IDLE/INACTIVE mode measurements and on UE behavior in IDLE/INACTIVE mode are not in scope.

3 Intermediate Round

3.1 Objective #3

Please indicate below if you agree with or have any comment on Moderator Proposal #4.

Feedback Form 3: Intermediate Round: Objective #3

1 – Nokia

We appreciate the moderator's effort at compromise. However, replacing "study" with "downselect" is not acceptable to us since "downselect" limits RAN3 discussion to solutions that are already on the table. This goes beyond current RAN3 agreements, which is only "the solution is FFS". We would like to suggest an alternative compromise, which is to simply drop the word "study/downselect" so that Proposal #4 reads:

To specify, if needed, a solution to avoid unnecessary signaling exchange between MN and target SN.

One additional small comment (if agreeable): "MN" could be clarified to "source MN".

2 – MediaTek Inc.

We support moderator's Proposal #4.

3 – Qualcomm Incorporated

we are OK with Nokia proposed wording.

4 – Spreadtrum Communications

We have similar comments as that of Nokia.

5 – Futurewei

We share the same view as Nokia's. We are fine with the wording proposed by Nokia.

6 – Samsung Electronics Co.

We support the proposal from the moderator. Nokia's suggestion is also acceptable to us.

7 – China Telecom Corporation Ltd.

We support the rewording proposed by Nokia.

8 – CATT

Ok with the proposal from Nokia

9 – vivo Mobile Communication (S)

We support moderator's proposal.

10 – HuaWei Technologies Co.

We are fine with the moderator's proposal, also see no big difference of Nokia's proposal and can be OK as well.

11 – HuaWei Technologies Co.

After a second thinking, we believe that the current wording from the moderator may miss the discussion on the reason why specifying something, where some proponents have doubt on the benefits and would like a proof of efficiency of such signaling optimization, we then prefer in line with Nokia with a softer text like

- **To select, if needed and beneficial,** a solution to avoid unnecessary signaling exchange between MN and target SN.

12 – Intel Corporation (UK) Ltd

The moderator proposal is fine for us.

13 – Intel Corporation (UK) Ltd

The moderator proposal is fine for us.

14 – Intel Corporation (UK) Ltd

The moderator proposal is fine for us.

15 – Intel Corporation (UK) Ltd

The moderator proposal is fine for us.

16 – VODAFONE Group Plc

we are OK with the suggestion from Nokia.

17 – Ericsson LM

We support moderator's proposal.

18 – LG Electronics Polska

We are okay with Nokia's wording.

19 – ZTE Corporation

We are okay with Nokia's proposed wording.

20 – InterDigital

We are fine with the suggestion from Nokia.

3.2 Objective #7

Please indicate below if you agree with or have any comment on Moderator Proposal #5.

Feedback Form 4: Intermediate Round: Objective #7

1 – Apple Hungary Kft.

We would propose a minor re-wording to clarify that it is not an objective to specify, but rather specify if the RAN4 agrees on such requirements.

To study and **if needed,** specify how to reuse the IDLE/INACTIVE mode measurement results which are to be reported during RRC connection setup/resume in order to improve SCell/SCG setup delay [RAN4, RAN2]

2 – MediaTek Inc.

We support Moderator's Proposal #5.

3 – Spreadtrum Communications

We are fine with Proposal #5.

4 – QUALCOMM JAPAN LLC.

We support moderator's proposal #5, except that we have one suggestion.

It is our understanding that RAN4 still need to figure out whether the measurement results would be available "during" RRC connection setup / resume procedure. We believe it is benefitial to keep the possibility open for the UE continue performing measurements in a (hopefully very) short period after entering CONNECTED mode. We therefore propose the following addition to the objective text.

- To study and specify how to reuse the IDLE/INACTIVE mode measurement results which are to be reported during **and/or after** RRC connection setup/resume in order to improve SCell/SCG setup delay [RAN4, RAN2], incl.

5 – Guangdong OPPO Mobile Telecom.

we are fine to continue the work in RAN4 i.e. the 1st and 2nd sub-bullet in proposal 5. but we don't see invovlement of RAN2 is necessary. If UE report some measurement results, they should be valid otherwise it doesn't make sense to report them. hence we suggest to remove 3rd sub-bullet and relevant Note 1 and [RAN2] from main bullet.

6 – Futurewei

We are fine with the moderator's Proposal 5.

7 – Samsung Electronics Co.

We support the proposal from the moderator.

8 – China Telecom Corporation Ltd.

We are fine with moderator's porposal 5.

9 – vivo Mobile Communication (S)

Thanks moderator for the great efforts by taking all the comments into account to propose a compromised way forward. We are in principle fine to take the simple objective description without listing the procedures for improved measurements. However, the current wording is not clear in our understanding. The UE is to use the EMR results for further improved measurements during RRC connection setup/resume. The EMR results may not be reused directly. The RAN4 requirements and RAN2 signaling/procedure should be for the improved measurements during and /or after RRC connection setup/resume.

The suggested revision of objective 7 is as below.

To study and specify **requirements, procedures and signaling, if needed, for improved measurements** during **and/or after** RRC connection setup/resume ~~how to reuse~~ **by using** the IDLE/INACTIVE mode measurement results ~~which are to be reported during RRC connection setup/resume~~ in order to improve SCell/SCG setup delay [RAN4, RAN2], incl.

- Availability and validation of the IDLE/INACTIVE mode measurement results to be reported [RAN4]; and
- Definition of corresponding RRM requirements [RAN4]; and
- Definition of corresponding signaling support [RAN2].
    - NOTE 1: RAN4 will coordinate in due course with RAN2 to start the work.
- NOTE 2: R4-2220415 serves as baseline for future work in RAN4
- NOTE 3: With exception of the above scenarios, enhancements on IDLE/INACTIVE mode measurements and on UE behavior in IDLE/INACTIVE mode, **i.e., the measurements and UE behavior related to legacy EMR,** are not in scope.

10 – vivo Mobile Communication (S)

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- NOTE 2: R4-2220415 serves as baseline for future work in RAN4
- NOTE 3: With exception of the above scenarios, enhancements on IDLE/INACTIVE mode measurements and on UE behavior in IDLE/INACTIVE mode, **i.e., the measurements and UE behavior related to legacy EMR,** are not in scope.

11 – HuaWei Technologies Co.

In the first round there is a majority supporting the moderator's previous proposal. We cannot agree to having a specific RAN2 objective without a further concrete study on the remaining RAN4 issues. Therefore we suggest to remove impact on RAN2 and the corresponding RAN2 objective, focusing on the study for the remaining RAN4 issues. We also support Apple's suggestion to add "if needed" as this is pending on the output of the RAN4 study, as a compromise.

12 – MediaTek Inc.

Moderator comments:

- re:RAN2: rather than removing the objective, I would propose instead to add "Depending on RAN4 outcome, definition of corresponding signaling support [RAN2]"
- re:vivo/Qualcomm comments: I am ok to consider "during and/or after" - if others are also fine with that.

13 – Ericsson LM

We support moderator's proposal # 5. In our view this is good compromise even though in our view normative part can start but we are OK with the proposed wording. We are also OK with the wording update from Qualcomm.

However, we do not see any need to state e.g. if needed, as proposed by Apple. It is clear that RAN4 will study and specify the requirements.

14 – CATT

Support proposal #5 from moderator

15 – LG Electronics UK

We are fine for moderator's proposal#5, except for the 3rd sub-bullet. The bullet "Depending on RAN4 outcome, definition of corresponding signaling support [RAN2]" in comment #12 is still not clear to us. As we commented in initial round, depending on RAN4 progress, it should be decided whether RAN2 is involved. So, we suggest to remove anything related to RAN2 in the objective.

16 – Intel Corporation (UK) Ltd

We support moderator proposal. The modifications proposed by Apple and QC are both fine for us. The moderator recommendation on the revised wording on RAN2 involvement is fine for us.

17 – Nokia Corporation

We agree with Qualcomm and Vivo that measurements also after RRC connection setup/resume should be part of the RAN4 work and support Qualcomm's wording update. We also appreciate the moderator's willingness to update the text accordingly.

We do not agree with Apple's proposal to add "if needed". Like Ericsson already commented RAN4 will study and specify the requirements.

Regarding the RAN2 signalling parts we could use similar approach and wording as used earlier so that RAN2 signalling will be defined based on RAN4's decisions and guidance. Thus, we would propose to use "based on RAN4 outcome".

18 – VODAFONE Group Plc

We agree with comments from Apple and Vivo. . The modifications proposed by Apple is fine for us. The moderator recommendation on the revised wording on RAN2 involvement is fine for us.

19 – ZTE Corporation

We support moderator's proposal #5 and additional comments

20 – HuaWei Technologies Co.

Regarding the RAN2 involvement, with the addtion from the moderator, it can be interpreted that as long as there is an outcome from RAN4, there will be definitely signaling impact for RAN2, but actually several companies think this may not be true. Therefore we still suggest to remove this bullet. Or alternatively, we could be open if we change as below and we are also wondering whether this addition ”depending on RAN4 outcome” means RAN2 will discuss this after RAN4 first concludes the corresponding remaining study?

Depending on RAN4 outcome, potential signaling support, if needed and beneficial.

Regarding the ”and/or after”, if it is after RRC connection setup, we want to also understand whether the existing mehcanism could already be sufficient. This is also a bit unclear to us.

21 – InterDigital

Thank you to the moderator for the nice compromise proposal, it looks OK to us and we are also OK with the QC suggestion on during/after. We also agree that RAN2 involvement depends on further RAN4 discussion, so updating according to the Moderator’s updated proposal seems fine too.

3.3 Summary from Intermediate Round

3.3.1 Objective #3

The moderator had made the following proposal:

Moderator Proposal #4: Update Obj#3 as follows

- ~~To specify data forwarding optimizations for~~For CHO including target MCG and target SCG in NR-DC [RAN3]:
  - to specify data forwarding optimizations; and
  - to *downselect* and, if needed, specify a solution to avoid unnecessary signaling exchange between MN and target SN.

Nokia proposed instead (for the 2nd subbullet):

  - *to specify*, if needed, a solution to avoid unnecessary signaling exchange between *source* MN and target SN

Five (5) companies support the Moderator proposal.

Eleven (11) companies support Nokia’s rewording.

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The Moderator acknowledges Nokia proposal is a better suggestion altogether (whilst it also encompasses the moderator proposal, but does not purely restrict to a downselection).

The Moderator therefore proposes to agree with Nokia wording and **to conclude this discussion.**

Moderator Proposal #6: Update Obj#3 as follows:

- ~~To specify data forwarding optimizations for~~For CHO including target MCG and target SCG in NR-DC [RAN3]:
    - to specify data forwarding optimizations; and
    - *to specify*, if needed, a solution to avoid unnecessary signaling exchange between *source* MN and target SN

3.3.2 Objective #7

The moderator had made the following proposal:

Moderator Proposal #5: revise Obj#7 (all new text)

- To study and specify how to reuse the IDLE/INACTIVE mode measurement results which are to be reported during RRC connection setup/resume in order to improve SCell/SCG setup delay [RAN4, RAN2], incl.
    - Availability and validation of the IDLE/INACTIVE mode measurement results to be reported [RAN4]; and
    - Definition of corresponding RRM requirements [RAN4]; and
    - Definition of corresponding signaling support [RAN2].
        - NOTE 1: RAN4 will coordinate in due course with RAN2 to start the work.
    - NOTE 2: R4-2220415 serves as baseline for future work in RAN4
    - NOTE 3: With exception of the above scenarios, enhancements on IDLE/INACTIVE mode measurements and on UE behavior in IDLE/INACTIVE mode are not in scope.

There was some overall support for the above, however the following comments were made:

- ”during” RRC Connection setup/resume is restrictive given the UE could for a very short period after the connection is setup/resumed be performing measurements; ”during and/or after” was recommended by Qualcomm - no concern were expressed.
- Mics. comments made regarding RAN2 involvement. It is understood that RAN2 objective is conditional to RAN4 outcome i.e. if RAN4 conclusion leads to required signaling support in RAN2 then RAN2 will need to do some work - there is nothing more to that. The moderator invites companies to keep this in mind.
- one company suggested to *add* ”To study and specify *if needed* [...]” - which received one support and misc. concerns. The moderator thinks the current text is reasonable in view of the comments received in the initial and intermediate rounds and the underlying RAN4 discussions.
- one company suggested further finetuned rewording of the objective, with some possible concern on the text being otherwise potentially confusing. One company supported the proposed rewording.
    - Given reference is made to RAN4’s R4-2220415 in NOTE 2, given the sub-bullets referring to the definition of requirements, signalling, the Moderator thinks the text as proposed in Moderator Proposal#5 together with the suggestion from Qualcomm is sufficiently clear for RAN4.

The Moderator therefore proposes to agree the following (changes in bold vs. earlier version)

Moderator Proposal #7: revise Obj#7 (all new text)

- To study and specify how to reuse the IDLE/INACTIVE mode measurement results which are to be reported during **and/or after** RRC connection setup/resume in order to improve SCell/SCG setup delay [RAN4, RAN2], incl.
    - Availability and validation of the IDLE/INACTIVE mode measurement results to be reported [RAN4]; and
    - Definition of corresponding RRM requirements [RAN4]; and
    - **If necessary based on RAN4 outcome,** definition of corresponding signaling support [RAN2].
        - NOTE 1: RAN4 will coordinate in due course with RAN2 to start the work.
    - NOTE 2: R4-2220415 serves as baseline for future work in RAN4
    - NOTE 3: With exception of the above scenarios, enhancements on IDLE/INACTIVE mode measurements and on UE behavior in IDLE/INACTIVE mode are not in scope.

4 Final Round

The Moderator would like to use the final round of the discussion should there be any **critical comments** on objective #7 i.e. Moderator Proposal #7.

Please use the feedback form below.

Feedback Form 5: Final Round (Critical comments only): Objective #7

No comments were received in the final round - the moderator therefore assumes Moderator Proposal #7 is agreed.

5 Conclusions

The following decisions have been reached:

DECISION 1: Moderator Proposal #2 is agreed i.e.

- **RP-222727 [1] is noted.**

DECISION 2: Moderator Proposal #6 is agreed i.e.

- **Moderator Proposal #6:** Update Obj#3 as follows:
  - ~~To specify data forwarding optimizations for~~For CHO including target MCG and target SCG in NR-DC [RAN3]:
    - to specify data forwarding optimizations; and
    - *to specify*, if needed, a solution to avoid unnecessary signaling exchange between *source* MN and target SN

DECISION 3: Moderator Proposal #7 is agreed i.e.

- **Moderator Proposal #7:** revise Obj#7 (all new text)

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- To study and specify how to reuse the IDLE/INACTIVE mode measurement results which are to be reported during **and/or after** RRC connection setup/resume in order to improve SCell/SCG setup delay [RAN4, RAN2], incl.
  - Availability and validation of the IDLE/INACTIVE mode measurement results to be reported [RAN4]; and
  - Definition of corresponding RRM requirements [RAN4]; and
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    - NOTE 1: RAN4 will coordinate in due course with RAN2 to start the work.
  - NOTE 2: R4-2220415 serves as baseline for future work in RAN4
  - NOTE 3: With exception of the above scenarios, enhancements on IDLE/INACTIVE mode measurements and on UE behavior in IDLE/INACTIVE mode are not in scope.

The Moderator has provided a Revised WID implementing DECISIONS 2 and 3 in **RP-223520**.

The Moderator recommends approving RP-223520.