

3GPP TSG RAN Meeting #94-e
RP-213625

Electronic Meeting, December 6 - 17, 2021

Agenda item: 9.3.4.3
Source: RAN4 Vice-Chair (Samsung)
Title: Moderator's summary for email discussion [94e-48-R17-NR-DemodPerf]
Document for: Discussion & Decision

1 Introduction

This document provides as summary of the following discussion during RAN#94-e:

[94e-48-R17-NR-DemodPerf]

Goal: Seek for the conclusion on the WID update of Further enhancement on NR demodulation performance WI

Input contributions covered: RP-213089 (revised WID)

2 Initial round

2.1 Open issues

Issue 1: WID update (RP-213089)

Change 1: The proposed changes on WI objectives from RP-213089 as highlight below (new sentences highlight in bold):

“Phase II: Define NR PDSCH demodulation requirements for neighbouring cell LTE CRS-IM in scenarios with overlapping spectrum for LTE and NR

- Use LLR weighting as baseline reference receiver.*
- Focus on synchronous network scenario.*
- 15 kHz SCS for NR is prioritized. **The 30 kHz SCS scenario will be discussed after RAN #94e meeting.***
- **Introduce UE capability signalling.***

- Other aspects will be further discussed in RAN4 and RAN #94e.
~~Note: The 30 kHz SCS scenario will be discussed after RAN #94e meeting.~~

Change 2: update on work item leadership (Adding RAN2 as secondary WG)

”RAN WG4

Secondary responsibility: RAN WG2 ”

2.2 Collection of company views

Please provide your comments/suggestions on the proposed changes on revised WID (RP-213089).

Feedback Form 1: Comments on revised WID (RP-213089)

1 – Ericsson France S.A.S

The objective ”Other aspects will be further discussed ” is rather unclear. Whilst doing an update, it would be good to clean out this text if it is not obvious which other aspects are referred to, or else to focus the objective by listing what the ”other aspects” are that should be discussed in RAN4.

2 – AT&T GNS Belgium SPRL

We generally support the WI revisions as proposed in RP-213089. Additionally, with respect to these changes, we propose some additional minor corrections/clarifications:

- Since we are adding core part objectives, we should mark this as such in the WID: This WID includes a Core part X
- In the baseline, all objectives were previously only RAN4 objectives. Now with the added RAN2 objective, we propose adding the following: Introduce UE capability signalling [RAN2].
- Since we added RAN2 as secondary WG, RAN4 should be denoted as ”primary” in section 7
- Agree with the Ericsson comment regarding ”Other aspects will be further discussed” At this late stage we may wish to remove this ”objective” or add details envisioned for ”other aspects”.

3 – MediaTek Inc.

Thanks for provide the WID update. We have the following comments.

- We are fine with adding the UE capability in the WID.
- Regarding 30 kHz SCS, we need to allow RAN4 to discuss the feasibility and UE complexity first, instead of directly put it in phase II to define requirements. At least in our view, handling interference under mix-numerology case would require some additional UE effort and it is not very straightforward (even for LLR weighting).
- Regarding other aspect, we share similar view as Ericsson. Some clarification in plenary by listing the items would help RAN4 to remove the uncertainty and focus on the issues to be resolved.

4 – Nokia Japan

As commented by Ericsson, we also support removing ”*Other aspects will be further discussed in RAN4 and RAN #94e*” from the WID.

5 – Qualcomm Incorporated

We agree with the suggestions from AT&T on how to modify the WID. We also think that handling of 30kHz SCS should be de-prioritized or postponed to a later date since the progress on the requirements with 15kHz has been rather slow and the presence of assistance data is still discussed. RAN4 should focus on focus on finalizing the requirements for this scenario since it is by far the most common. We also agree with the Mediatek’s comments that handling of 30kHz SCS is not straightforward.

6 – China Telecom Corporation Ltd.

Thanks for the discussion.

- We agree with the first three bullets suggested by AT&T.
- On the 30 kHz SCS scenario, the current wording already means feasibility study is needed. The feasibility study for 30 kHz SCS was included in Phase I, but there was no time to study on it in Phase I. So, it was moved to phase II.
- On the “other aspects”, this sentence was already in the WID approved at RAN #93e. It includes “the necessity of network assistance information” and “whether to include CRS-IC” if we understand correctly.

7 – Apple GmbH

We agree with MediaTek and Qualcomm that 30 KHz SCS case for CRS-IM is not straightforward and should be de-prioritized given the progress on 15KHz and other pending issues. In our understanding the intention of “other aspects” in the WID was for network assistance signalling and UE capability signalling. Since UE capability signalling is agreed in RAN4 and proposed as part of WID update, we suggest refining text as - Network assistance signalling will be further discussed.

8 – China Mobile Com. Corporation

Regarding the 30KHz, it was already postponed for several meetings. In last plenary, we discussed the start time for 30KHz and agreed to start after RAN#94. We cannot discuss the same issue in each plenary meeting, the previous agreements should be respected. We emphasis for many times that 30KHz is a pratical deployment scenario and CMCC already observed the interference in this sceanrio. It is important to start the discussion on 30KHz after RAN#94 meeting.

9 – Intel Corporation SAS

- “30kHz SCS”: we support the proposed change and open to do the work in RAN4
- The original intention of “Other aspects will be further discussed” statement was to allow RAN4 discussion on network assistance and CRS-IC reference receiver. We prefer to keep the note with the updates proposed by rapporteur. Alternatively, we would be fine to capture that “*Other aspects including network assistance and CRS-IC receiver requirements will be further discussed in RAN4 and RAN #94e*”

- For RAN2 scope we suggest including network assistance as follows “*Introduce network assistance and UE capability signalling [RAN2]*”

10 – ZTE Wistron Telecom AB

- (1) Considering there is only one quarter left for this WID, we tend to agree with Ericsson and other companies to remove the “Other aspects” sub-bullet to keep focused on the completion.
- (2) For 30kSCS, the current wording “will be discussed” looks a bit vague as one of objectives. Either we set a target to complete 30kSCS works, or it will be done in a best-effort way.
- (3) Adding RAN2 as a secondary WG: Like some other WIs, if the corresponding RAN2 works are mainly triggered by RAN4-to-RAN2 LSs, it seems not necessary to add RAN2, which means there is no explicit TU allocated to this WI in RAN2’s TU budget table.

11 – Samsung Electronics Co.

- 1) For objective “Introduce UE capability signalling” we support to include this objective respecting latest RAN4 agreement. Responsible WG can be [RAN2, RAN4] for this objective.
- 2) For 30kHz SCS we support to trigger the discussion after RAN#94e since this is RAN#93e agreement. We also agree RAN4 need to first address feasibility before specifying corresponding performance requirements.
- 3) For other aspects, we share same view as other companies it’s better to clarify which aspects need to be further discussed. Based on the discussion status in RAN4, we think at least network assistant signalling need to be further discussed.

12 – Huawei Technologies France

RAN4 has agreed to introduce UE capability signalling for support CRS-IM (i.e. LLR weighting), also RAN4 is discussing the introduction of UE capability signalling for UE receiver without blind detection, to avoid confusion and possible misunderstanding, it is better to clearly specify that: ***Introduce UE capability signalling for support CRS-IM***

2.3 Summary and recommendation for further discussion

Based on the comments received from companies in 1st round, the observations summarized as below:

- The objective “Introducing UE capability signalling”: All companies agree to include capability signalling into WI objective which aligned latest RAN4 agreement. One company comment on the update on section 7, RAN4 should be denoted as “primary” in section. Regarding RAN2 scope and responsible WGs, following views collected in initial round:
 - o Several companies suggest this objective should be added into core part, and taking RAN2 as responsible WG.
 - o One company (Intel) suggest to add RAN2 scope as “*Introduce network assistance and UE capability signalling [RAN2]*”.
 - o One company (ZTE) suggest RAN2 work can be triggered via LS between RAN4 and RAN2. Not necessary to add RAN2.
 - o One company suggest to update the objective as “Introduce UE capability signalling for support CRS-IM”

- The objective “30kHz SCS scenario”: Some companies (QC, Apple, MTK) comment 15kHz should be prioritized given current progress in RAN4, also suggest to discuss the feasibility of supporting 30kHz SCS first before specifying corresponding performance requirements. Two operators share the request to start the discussion on 30kHz SCS since this already postponed by several meetings. Given the fact, in current WID, we already have a statement “15 kHz SCS for NR is prioritized.” And in last RAN-P, we already agreed to discuss 30kHz SCS scenario after RAN#94e. Moderator suggests to start the discussion on 30kHz SCS scenario including feasibility study phase before specifying corresponding performance requirement.
- The objective “Other aspects will be further discussed”: Several companies want to clarify the exact items which need to be further discussed and suggest either list exact items or remove such sentence if no items identified. Based on companies’ feedback, other aspects including two items: “necessity of network assistant signalling” and “whether to include CRS-IC receiver”. Moderator suggests to list clear items for other aspect which need to be further discussed, and candidate items including “network assistant signalling” and “CRS-IC receiver”.

Respecting the agreements in previous RAN-P and RAN4 meetings and comments received in initial round, moderator would like to give below suggestions:

Proposal 1: Including objective “Introducing UE capability signaling for supporting CRS-IM” into WI Core part, taking RAN2 as responsible WG.

- Further confirm above proposal and refinement of the objective in 2nd round

Proposal 2: The 30kHz SCS scenario will be discussed after RAN#94e, RAN4 will discuss the feasibility of supporting 30kHz SCS and specify corresponding performance requirements if needed.

- Further confirm above proposal and refinement of the objective in 2nd round

Proposal 3: Further discuss and decide detailed items under the objective “other aspects will be further discussed”. Candidate items including:

- Network assistant signalling
- CRS-IC receiver

3 Intermediate round

3.1 Open issues

Issue 1-1: objective “Introduce UE capability signaling

Proposal: Including objective “Introducing UE capability signaling for supporting CRS-IM” into WI Core part, taking RAN2 as responsible WG.

Issue 1-2: objective “30kHz SCS scenario

Proposal: The 30kHz SCS scenario will be discussed after RAN#94e, RAN4 will discuss the feasibility of supporting 30kHz SCS and specify corresponding performance requirements if needed.

Issue 1-3: objective “Other aspects will be further discussed

Proposal: Further discuss and decide detailed item(s) under the objective “other aspects will be further discussed” Candidate items including:

- Network assistant signaling
- CRS-IC receiver

3.2 Collection of company views

Please provide comments and suggestions on the proposed objective on issue 1-1.

Feedback Form 2: Issue 1-1: objective “Introduce UE capability signaling”

<p>1 – China Mobile Com. Corporation</p> <p>We support the proposals provided by moderator for issue 1-1, 1-2 and 1-3.</p>
<p>2 – Intel Corporation SAS</p> <p>In the previous RAN4 meeting it was decided that NWA signaling is required to inform UE, that network configuration (CRS muting, MBSFN configuration, Channel bandwidth and centre frequency) is different comparing to the default assumptions used for requirements definition. Therefore, we suggest to include introduction of network assistance signaling in the RAN2 scope in addition to capability signalling.</p>
<p>3 – Apple GmbH</p> <p>We support the proposal from moderator and also agree with Intel on adding the NWA in RAN2 scope as agreed in RAN4#101-e.</p>
<p>4 – China Telecom Corporation Ltd.</p> <p>We support the moderator proposal for Issue 1-1.</p>
<p>5 – Huawei Technologies France</p> <p>We are fine with moderator’s proposal for Issue 1-1.</p>
<p>6 – MediaTek Inc.</p> <p>We agree with Intel to further include network assistance information in RAN2 scope</p>
<p>7 – Qualcomm Incorporated</p> <p>We agree with the moderator proposal. We also think it would be a good idea to include the assistance signaling in the scope of RAN2</p>
<p>8 – ZTE Wistron Telecom AB</p> <p>We are fine with Moderator’s proposal on Issue 1-1. One thing should be confirmed that it has no impact on the current RAN2 TU budget.</p>

9 – Ericsson France S.A.S

We are OK with regard to the moderator proposal. Concerning the network assistance signaling, so far it was agreed that there can be signaling to indicate if the network configuration differs from the assumption. There was not agreement on other signaling. So we are OK to include network signaling in the RAN2 scope, but we would like the objective to be clear that apart from the indication of different configuration, the need for any further signaling is still FFS in RAN4.

10 – KDDI Corporation

We support the moderator proposal for Issue 1-1.

Please provide comments and suggestions on the proposed objective on issue 1-2.

Feedback Form 3: Issue 1-2: objective “30kHz SCS scenario”

1 – China Mobile Com. Corporation

Support the proposal from moderator.

2 – Intel Corporation SAS

Support proposal.

3 – Apple GmbH

We support the proposal.

4 – Apple GmbH

Given that only 2 meetings are left for the WI, we are wondering it is practical to expect to complete feasibility study and requirements definition within that time.

5 – China Telecom Corporation Ltd.

We support the moderator proposal for Issue 1-2.

6 – Huawei Technologies France

We are fine with moderator’s proposal for Issue 1-2.

7 – MediaTek Inc.

We are fine with moderator’s suggestion.

8 – Qualcomm Incorporated

We do not think RAN4 will have enough time to complete the work on 15kHz and also do the evaluation for 30kHz. Handling of 30kHz SCS is complicated because orthogonality is lost so power estimation will be difficult even for LLR weighting.

9 – ZTE Wistron Telecom AB

We are ok with Moderator’s proposal on Issue 1-2.

10 – Ericsson France S.A.S

We share the Qualcomm view that 30kHz SCS may be difficult and scenarios for it are very limited. It should be clear that the main priority is solving the 15kHz SCS case.

11 – China Mobile Com. Corporation

We disagree that scenarios for 30KHz is limited. In scenario 2, 30KHz is typical deployment scEANrio for 30KHz and we already observed interference caused by LTE CRS in our practical network. 30KHz was included from the beginning of this work, we explained many times about the importance of 30KHz scenario. In last plenary meeting, it was agreed that 30KHz will start after RAN#94 meeting and it is also captured in the WID. We should respect to the previous agreements.

Since this is performance part discussion, the completion date should be Sepetember or December, not March as commented by Apple. So we still have time for the remaining work. We strongly support to stick to previous agreement and do not repeat the discussion everytime. Thank you.

12 – KDDI Corporation

We support the moderator proposal for Issue 1-2.

Please provide your comments on the candidate items for the objective “Other aspects will be further discussed”.

Feedback Form 4: Issue 1-3: objective “Other aspects will be further discussed”

1 – China Mobile Com. Corporation

Support the proposal from moderator.

2 – Intel Corporation SAS

Support the listed candidate items (i.e. CRS-IC and network assistance signaling)

3 – Apple GmbH

We support to list the other aspects as network assistance signaling and CRS-IC.

4 – Huawei Technologies France

We are fine with moderator’s proposal for Issue 1-3.

5 – China Telecom Corporation Ltd.

We agree that other aspects include ”Network assistant signaling” and ”CRS-IC receiver” aspects. For network assistance signaling, we need to keep in mind the latest progress in RAN4:

1) RAN4 agreed that Network can inform to UE by NWA signalling if the following network configuration assumptions are not valid:

- no CRS muting,
- MBSFN configuration same as serving cell for scenario 1; NO MBSFN configuration for scenario 2

- Channel bandwidth and centre frequency aligned for the serving and neighbouring cells for scenario 1

2) It is still under discussion in RAN4 on whether any of other NWA signaling is needed.

6 – MediaTek Inc.

We are fine with moderator’s suggestion.

7 – Qualcomm Incorporated

Based on the previous RAN4 agreement, RAN4 is still to make a decision on assistance signaling so this has to be discussed. Regarding CRS-IC, we do not think there is point to try to continue the discussion given the time left in this release and the fact that 30kHz SCS is also in the pipeline. WE think CRS-IC should be removed for now.

8 – Ericsson France S.A.S

For the network assistance signaling, we are OK to continue the discussion as long as the objective is clearly to discuss whether further signaling is not needed and not an agreement to include additional signaling.

For the CRS-IC we have not seen a large benefit and there is not much time in the WI. It should be removed, or at least clear that the 15kHz LLR weighting solution is prioritized.

9 – KDDI Corporation

For the network assistance signaling, we fully agree with Ericsson.

3.3 Summary and recommendation for further discussion

Based on the comments received from companies in 2nd round, the observations summarized as below:

– Issue 1-1: objective “Introduce UE capability signaling”:

- o All the companies ok with moderator’s suggestion to include objective “Introduce UE capability signaling” as RAN2 scope.
- o For RAN2 scope, companies also suggest to include objective “NWA assistant signaling”. This proposal seems agreeable for companies based on last RAN4 meeting agreement.
 - One company also mentioned RAN4 only agree to introduce indication of different configuration, and other needs on assistant signalling are still FFS in RAN4. Based on moderator’s understanding, that’s the fact detailed needs of assistant signaling are still subject to further discussion in RAN4.
 - Also one company mentioned this it has no impact on the current RAN2 TU budget. It’s moderator’s understanding, dedicated TU maybe not necessary given the limited effort on RAN2 expected; this may be subject to MCC and RAN2 chair’s confirmation.

– Issue 1-2: objective “30kHz SCS scenario

- o 9 companies share supporting on moderators’ proposal including 3 operators. And one operator shares the strong market demand on this scenario,
- o 3 companies comment 15kHz need to be prioritized and concern on RAN4 workload and timeline to complete the work.

- From moderator perspective as mentioned in 1st round, we already have a statement “15 kHz SCS for NR is prioritized.” in current WID. And in last RAN-P, we already agreed to discuss 30kHz SCS scenario after RAN#94e. Following Rel-17 performance timeline, the work can be continued till September 2022 for specifying performance requirements under. Moderator suggest to respect previous RAN-P agreement and start the discussion on 30kHz SCS scenario with feasibility study phase under the condition any cross WG impact shall be concluded before March 2022.

– **Issue 1-3: objective “Other aspects will be further discussed**

- All the companies agree “network assistant signaling” need to be further discussed in RAN4.
- For “CRS-IC receiver”, 6 companies OK to be further discussed in RAN4. And 2 companies concern the work load and benefits over LLR weighting and suggest to stop the discussion on this issue.

Respecting the agreements in previous RAN-P and RAN4 meetings and comments received in this round, moderator would like to give below suggestions:

Issue 1-1: RAN2 scope

Proposal 1: Including objective “Introducing UE capability signaling and network assistant signaling for supporting CRS-IM [RAN2] ”into WID Core part, taking RAN2 as responsible WG.

- Note: The detailed needs of assistant signaling are still subject to further discussion in RAN4.

Issue 1-2: objective “30kHz SCS scenario

Proposal 2: Including objective “Evaluate the feasibility of supporting 30kHz scenario and specify performance requirements if needed”.

- Note 1: 15kHz will be prioritized
- Note 2: Any cross WG impact shall be concluded before March 2022.

Issue 1-3: objective “Other aspects will be further discussed

Proposal 3: Network assistant signaling will be further discussed in RAN4

- Note: The detailed needs of assistant signaling are still subject to further discussion in RAN4.

Proposal 4: CRS-IC receiver, further discuss below two options in GTW session:

- Option 1: Further discussed in RAN4 and check the status in RAN#95e if needed
- Option 2: Further discuss CRS-IC receiver in Rel-18

4 Final round

Wednesday GTW conclusion:

- **Proposal 1 (“UE capability signaling part”) agreed**
- **Proposal 2 agreed**
- Proposal 1 (“network assistant signaling part”), proposal 3 and proposal 4 need to be further discussed.

4.1 Open issues

For network assistant signaling part,

As several companies commented we already have following agreements in last RAN4 meeting (Refer to R4-2120705):

Table 1:

<p><i>Assumptions on the network configuration: Part I (excepting CRS port number)</i> <i>For scenario 1 and 2, by default, UE follow below assumption of Network configuration for CRS-IM receiver no CRS muting,</i> <i>MBSFN configuration same as serving cell for scenario 1; NO MBSFN configuration for scenario 2</i> <i>Channel bandwidth and centre frequency aligned for the serving and neighbouring cells for scenario 1</i> <i>If above assumption not aligned with NW configuration:</i> <i>- Network can inform to UE by NWA signalling.-FFS for the details of NWA signalling</i> <i>It's Network decision whether need to be informed to UE even the network configuration not aligned with default assumption. From network perspective, if such information conveys to UE, network expect UE should not follow the default assumption.</i> <i>- FFS whether UE blind detection can be considered as candidate UE receiver. If such UE capability introduced, separate UE capability signalling need to be introduced for UE receiver without blind detection</i></p>

Based on above agreement, introducing NWA signaling unavoidable at least for the indication if NW configuration not aligned with default assumption meanwhile it's still up to Network to decide whether such signaling need to be informed to UE or not; with this we can have full implementation flexibility for both Network side and UE side. The details of such NWA signaling and whether any other parameters need to be considered still subject to RAN4 further discussion and evaluation. Given above status, it's the fact RAN4 need to further discuss on the network assistant signaling part.

For moving forward, moderator proposed a comprise proposal for “network assistant signaling part”

Proposal 3a: Network assistant signaling will be further discussed in RAN4

- Note 1: The necessity and details of network assistant signaling are still subject to further discussion in RAN4.
- Note 2: The RAN2 objective on “network assistant signaling part” can be further decided in RAN#95e if needed pending on RAN4 discussion

For CRS-IC receiver part

We can further collect companies' feedback in final round for the two options.

Proposal 4: CRS-IC receiver, further discuss below two options

- Option 1: Further discuss in RAN4 and check the status in RAN#95e if needed
- Option 2: Further discuss CRS-IC receiver in Rel-18

4.2 Collection of company views

Feedback Form 5: Comments on network assistant signaling part

1 – China Telecom Corporation Ltd.

Generally we agree with the principle of the Proposal 3a, and some wording updates might be needed for the two notes:

For Note 1, it might be clearer to split it to two notes, to better reflect the RAN4 status.

For Note 2, considering there are 2 WG meetings in Q1 2022, if RAN4 reach any agreements in Q1 2022, RAN4 can directly send LS to RAN2 without waiting for the WID update at RAN #95e.

Suggested updates on the notes are as follows:

Proposal 3a: Network assistant signaling will be further discussed in RAN4

Note 1: ~~The necessity and details of network assistant signaling are still subject to further discussion in RAN4.~~

Note 1: The details of network assistant signaling if the network configuration differs from the assumptions agreed in RAN4 #101e will be further discussed in RAN4.

Note 2: The necessity of other network assistant signaling is subject to further discussion in RAN4.

Note ~~23~~: The RAN2 ~~work objective~~ on “network assistant signaling part” can be triggered by RAN4 LS ~~further decided in RAN#95e~~ if needed pending on RAN4 discussion.

2 – Qualcomm Incorporated

We think it would be good to already spell out that some signaling will be introduced, we support the Notes proposed by China Telecom. If no agreement can be reached on this issue then it is probably best not to do anything in plenary and just maintain the current agreements.

3 – Huawei Technologies France

We respect RAN4 agreements reached in last RAN4#101e, CRS muting, MBSFN configuration, CBW and centre frequency can be informed to UE by NW if those assumptions are not aligned with NW configuration, but it is up to network decision even the network configuration is not aligned with default assumption. The assumptions of number of CRS port and PCI are under discussion by further evaluation. But all those are for CRS-IM, i.e. LLR weighting. We understand all those configurations can be informed to UE by one new or existing RRC signalling instead of different signalling, so the updated wording from CTC is a little confusing for us, what other network signalling for other purpose will be discussed? So we think Proposal 3a is OK without Note 1 but with Note 2.

4 – Apple GmbH

The updated notes by China Telecom are agreeable with the following comments.

Note 1: We already agreed to have NWA in case the configuration is different from assumption, do we expect to further discuss the details of the signalling in RAN4? We need to capture that we have agreement to introduce such NWA as well.

In Note 3 its network assistance signaling if needed, while we agreed to some NWA already (when default assumption of NW configuration doesn't hold).

Note 23: The RAN2 **work objective** on “network assistant signaling part” can be **triggered by RAN4 LS** ~~further decided in RAN#95e if needed~~ pending on RAN4 discussion.

5 – Apple GmbH

We are still discussing NWA for LLR weighting and we have to also look into feasibility of supporting 30KHz SCS. We are fine to check in RAN#95 depending on progress in RAN4.

6 – MediaTek Inc.

The network assistance signaling was already discussed in RAN4 and the discussion will continue. We should not preclude any possibility at this moment nor agree anything further on behalf of RAN4. China Telecom's suggestion with Apple's revision is fine to us.

7 – ZTE Wistron Telecom AB

Just a kind reminder, according to RAN4 agreements (R4-2120705), it is still open whether or not to introduce network assistance signaling:

Whether to introduce network assistance signalling

- Option 1: Introduce network assistance on neighbour cell LTE configuration
 - o sub-options ...
- Option 2: Do not consider network assistant information

Moderator's Proposal 3a reflects correctly the current situation. For Note 2, considering it is now in an ending stage in Rel-17, it is fine with us that RAN2 works can be triggered by RAN4 LS if necessary.

8 – Ericsson France S.A.S

We are OK with proposal 3a as it is and the CT update.

9 – China Mobile Com. Corporation

Support proposal 3a from moderator.

10 – Intel Corporation SAS

We support wording proposed by China Telecom and Apple. Based on agreement from previous RAN4 meeting, listed by moderator, we can observe that network assistance signalling for some parts is agreed. Therefore, the necessity of NWA signalling is already concluded.

11 – Nokia Corporation

We acknowledge ZTE's quote of the current status of the RAN4 work and support option 3a as put forward by the moderator.

12 – KDDI Corporation

We support proposal 3a from moderator.

13 – China Telecom Corporation Ltd.

A quick response to ZTE's comment: as the owner of the RAN4 WF, we want to clarify that the options quoted by ZTE is for other related information. It does not conflict with the agreement in Table 1 as quoted by moderator.

Feedback Form 6: Comments on CRS-IC receiver part

1 – China Telecom Corporation Ltd.

We support to introduce CRS-IC in Rel-17 or Rel-18.

As seen in RP-213093 submitted to this meeting, based on the link-level simulation results, **1.4 dB to 2.3 dB performance gain** can be achieved by CRS-IC compared to LLR weighting in DSS scenario, using the parameters agreed in Rel-17.

We are ok to postpone CRS-IC to Rel-18, if no other NWA signaling is needed for LLR weighting.

In addition, based on the agreements on Proposal 1 ("UE capability signaling part") and Proposal 2, I updated the WID in:

https://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_94e/Inbox/Drafts/%5B94e-48-R17-NR-DemodPerf%5D/Revised%20213089_Revised%20WID%20for%20R17%20demod_cm.doc

Some editorial modifications were also made according to the comments, and other parts will be updated pending on further agreements.

2 – Qualcomm Incorporated

Given how the discussion so far has gone, we do not think there would be time to also handle CRS-IC in Rel.17. RAN4 still has to discuss and agree on the assistance signaling and the requirements with LLR weighting for 15kHz SCS. Handling of 30kHz SCS is also higher priority than CRS-IC and we should also keep in mind that CRS-IC itself will require a lot of time. With these considerations, we do not think it is feasible to introduce requirements with IC in Rel.17 so this should be postponed.

We would also like to point out that those gains mentioned by China Telecom are in ideal conditions, in normal conditions when we consider all the factors like cell detection delay, etc, the gains will actually be smaller.

3 – Huawei Technologies France

RAN4 has done lots of evaluations including CRS rate-matching, LLR weighting and CRS-IC, by comparing the performance gain and complexity, companies agreed to introduce LLR weighting, we don't think that it is necessary to additionally define any performance requirements for CRS-IC in either Rel-17 or Rel-18 after RAN4 agreed to define performance requirements for LLR weighting.

4 – Apple GmbH

We are still discussing NWA for LLR weighting and we have to also look into feasibility of supporting 30KHz SCS. We are fine to check in RAN#95 depending on progress in RAN4.

<p>5 – MediaTek Inc.</p> <p>We are fine to keep CRS-IC in the WI scope, but in the end whether to define requirements for CRS-IC should be decided by RAN4, not RAN Plenary. We are also fine to postpone it to Rel-18 to save RAN4 some time for finalizing the Rel-17 requirement</p>
<p>6 – ZTE Wistron Telecom AB</p> <p>In addition to the study of potentially achievable performance gains from CRS-IC, there are other aspects, e.g., potential impacts on processing delay, requiring further studies. In our views, it is better that RAN4 can focus on the issues still open and the addition of 30kSCS in the WI for the time being, thus our preference is Option 2 for Proposal 4.</p>
<p>7 – Ericsson France S.A.S</p> <p>We have not seen the benefits of CRS-IC and it also seems difficult to achieve within Rel-17. We also do not think it should be prioritized in Rel-18 either. So our preference would be not to continue discussion in RAN4.</p>
<p>8 – China Mobile Com. Corporation</p> <p>Considering that CRS-IC may require NWA and the left time for Rel-17 core part completion is quite limited, we can compromise to focus on LLR weighting in Rel-17.</p>
<p>9 – Intel Corporation SAS</p> <p>We support Option 1. We suggest to continue technical discussion in RAN4. Based on outcome of the previous RAN4 meetings, we have certain way forwards to discuss this topic.</p>
<p>10 – Nokia Corporation</p> <p>As commented by many, there doesn't seem to be sufficient time to work on CRS-IC in addition to the CRS-IM based on LLR weighting in Rel-17. Hence we support Option2, NOT spending RAN4 time on this in Q1/2022, and defer the work to Rel-18.</p>
<p>11 – KDDI Corporation</p> <p>We support option2. As Nokia pointed out, considering RAN4 work load, it would be better that RAN4 focus CRS-IM based on LLR weighting in Rel-17.</p>

Feedback Form 7: Comments on revised WID

4.3 Summary and recommendation for further discussion

Issue: NWA signaling part

Observation:

- Based on the comments received, all the companies agree the fact RAN4 still needs to further discuss NWA signaling based on the previous agreements achieved in RAN4.

- For the notes under proposal 3a, companies have different views. Moderator suggests no need to go to such details as well as existing agreements in RAN4 still valid, we can leave the details subject to RAN4 further discussion.
- Companies also suggest not precluding RAN2 work can be triggered via. LS from RAN4 in Q1 2022 considering Rel-17 timeline.

Modified Proposal 3a: Network assistant signaling will be further discussed in RAN4

- ~~Note 1: The necessity and details of network assistant signaling are still subject to further discussion in RAN4.~~
- ~~Note 2: The RAN2 objective on “network assistant signaling part can be further decided in RAN#95e if needed pending on RAN4 discussion”~~
- Note X: The RAN2 work on “network assistant signaling part” can be triggered by RAN4 LS if needed pending on RAN4 discussion.

Issue: CRS-IC receiver part

Observation:

- There is no consensus on whether CRS-IC receiver can be supported in Rel-17 and whether the discussion need to be continued in RAN4.
- 6 companies prefer to stop the discussion on CRS-IC receiver given the discussion status and work load in RAN4.
- 1 company prefers to continue the discussion in RAN4.
- 3 companies are fine for both options

Proposal 4: CRS-IC receiver, (Moderator suggest to further discuss in GTW session to reach agreement with below options)

- Option 1: Further discuss CRS-IC receiver in RAN4 and check the status in RAN#95e if needed
- Option 2: Further discuss CRS-IC receiver in Rel-18 if needed (Majority supporting)