97e-34-IntraBand-ENDC-Comb - Version 0.0.7
RAN

3GPP TSG RAN Meeting #97-e RP-222594

Electronic Meeting, September 12 - 16, 2022

Agenda Item: 9.12

Source: RAN Vice-Chair (AT&T)

Title: Moderator's summary for discussion [97e-34-IntraBand-ENDC-Comb]

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In this document, we will provide a summary for the email discussion [97e-34-IntraBand-ENDC-Comb] at RAN#97-e.

1 Topic #1: intraBandENDC-Support Ambiguities

1.1 Proposed Objectives

Topic #1 will capture the outcome of the discussions on the following document:

1) RP-222513 [1]

1.2 Initial Round

The initial round will be focused on collecting company views to include any opposing views and/or concerns with the proposals set forth in the document above. Companies are also requested to provide any suggested way forwards to consider in future rounds of discussion.

1.2.1 Open Issues

The following covers the observations and proposals listed in [1].

Observation 1: A UE is not allowed to indicate intra-band EN-DC contiguous/non-contiguous capability in UL or DL separately.

Observation 2: Whether contiguous or non-contiguous EN-DC is defined only based on DL configuration.

Proposal 1: Whether the intra-band EN-DC configurations related to Case 3 follow the fallback rule defined in TS38.306 is up to RAN2's decision. The clarification from RAN2 is necessary.

Proposal 2: For the problems of ambiguity on some intra-band ENDC band combinations with more than 2 carriers, justification and possible solution are necessary in RAN2 and RAN4.

Proposal 3: Agree to send the LS in annex to RAN2.

1.2.2 Collection of company views

Issue 1.2-1: Do you agree that clarification is needed from RAN2 as to whether the intra-band EN-DC configurations related to Case 3 follow the fallback rule defined in TS 38.306?

Feedback Form 1: Issue 1.2-1

1 – Apple (UK) Limited

We do not oppose to ask the clarification from RAN2. But we think the answer could be different depending on whether the Case 3 combination is defined as contiguous or non-contiguous. In RAN4, the Case 3 combination is currently defined as "contiguous" as it is only based on the DL configuration as stated in *Observation 2* in RP-222513. However, RAN4 has not really conceded that for intra-band EN-DC combinations, the "contiguous" or "non-contiguous" definition would only depend on DL configuration. It was simply based on the observation that the Case 3 combination is now listed in "contiguous" table in 38.101-3.

On the other hand, the fallback rule of a band combination in our understanding is meant to minimize the loading of signaling, meaning that only the highest order of the combination needs to be signaled to the network and all the lower-order band combinations are expected to be supported by UE. Since "contiguous" and "non-contiguous" represent two different UE capabilities as the corresponding UE RF requirements can be different, the fallback rule would prevent a contiguous combination to fall back to a non-contiguous combination as there is no guarantee that a UE supporting higher order contiguous combination can also support the lower order non-contiguous combinations by dropping one or more SCells without additional signaling.

2 – Huawei Technologies France

Yes, we think some clarification from RAN2 is necessary. The identified issue has been discussed in RAN4 for a long time but no conclusion yet. Whether the RAN2 spec on the fallback rule should be aligned with the configurations specified in RAN4 or the proposed combination configurations should follow the RAN2 spec is not clear based on the current RAN4 discussion. In general, we think RAN4 combination configuration should be the baseline as it represents the possible deployment scenario by operators.

3 – Ericsson LM

No clarification is needed. The configurations in Case 3 are not valid: a configuration cannot only be contiguous in the DL and non-contiguous in the UL. For the Case 3 configuration DL DC_(n)41CA with UL DC_41A-n41A it is impossible to release the middle DL SCell (without releasing EN-DC), the resulting fallback configuration DL DC_41A-n41A is not supported. This DL fallback would correspond to the supported UL non-contiguous configuration and must be supported to make the configuration valid. This is also consistent with the fallback rule for inter-band EN-DC in 38.101-3, ""A terminal which supports

an inter-band EN-DC configuration with a certain UL configuration shall support the all lower order DL configurations of the lower order EN-DC combinations, which have this certain UL configuration and the fallbacks of this UL configuration." The UE must also support DL DC_41A-n41A to support UL DC_41A-n41A.

4 – Guangdong OPPO Mobile Telecom.

To RAN2 the fallback rule is mainly for signaling optimization. But RAN2 can't decide whether UL non-contiguous combination is fallback case of contiguous since this is within RAN4's expertise. From current RAN4's table likely the answer is not because otherwise UL non-contiguous combination will not listed separately from contiguous combination.

5 – Samsung Electronics Co.

We are fine to ask for clarification from RAN2. From our observation, this issue has been struggled for more than one and half year but difficult to be addressed. As RAN4 basket rapporteur, we are also not quite convinced that whether the DL contiguous with UL non-contiguous configuration satisfy the fallback rule nor the configuration is valid or not, furthermore, RAN4's understanding about fallback rule sometimes seems not aligned with RAN2.

In addition, since last RAN4#104-e meeting, RAN4 is determined to specify and record the concrete fallback rules for the group reference, the direction is recorded in WF R4-2214425, but we are not very confident we could make conclusion in a short period time on this particular case. Hence in our view, hear the opinion from RAN2 would be beneficial. Meanwhile, discussion in RAN4 would continue and jointly conclusion could be made later.

6 – Google Inc.

As the above comments, fallback rule is the method to save overhead in UE capability signaling when reporting band combination. As long as the UE following the fallback rule, it should not prevent the UE from supporting any DL/UL configurations. For example, if the UE reports band combination DC_(n)48CA to the network, it can mean that the UE can support DL DC_(n)48CA with UL DC_(n)48AA and DL DC_(n)48AA with with UL DC_(n)48AA. For DL DC_(n)48CA with UL DC_48A_n48A, it can be supported if the UE reports this configuration to the network by some methods such as new signaling or reporting additional band combination. Since there are some CBRS operator requests for these combinations, and we are looking for the solution instead of removing these band combination. We are also fine to hear the suggestion from RAN2.

7 – VODAFONE Group Plc

We are supportive of asking for clarification from RAN2.

8 – MediaTek Inc.

A first step would be to understand how RAN2 specs are to be interpreted.

9 – Nokia Japan

It depends on the content of the LS. At least ACTION 1 is not needed. ACTION 2 covers ACTION 1 if necessary. Besides, the fallback rule itself is a rule that which lower order band combinations that UE supporting a higher order band combination shall support as precondition. Supporting additional band combination(s) which does not belong to fallback rule must not be forbidden. Hence, this may not be the main point of the discussion. If it is the main point, RAN2 will discuss this aspect by themselves on the way

to addressing ACTION 2. Moreover, deployment aspects mentioned in ACTION 1 should be discussed in RAN4.

Issue 1.2-2: Do you agree that RAN2 needs to consider whether a solution is necessary to address the ambiguity issue for configurations on some intra-band EN-DC band combinations with more than 2 carriers from Rel-15?

Feedback Form 2: Issue 1.2-2

1 – Apple (UK) Limited

We think the current RAN2 signaling design is sufficient to indicate UE's capability in supporting intra-band EN-DC combinations as we proposed in RP-210640 in RAN #91-e meeting. Whether the ambiguity would remain is subject to how RAN4 defines a higher-order combination as contiguous or non-contiguous.

2 – Huawei Technologies France

If RAN2 also thinks that the identified inconsistency is an issue to be addressed, then a solution would be necessary. In our view, at least RAN2 should be informed that different EN-DC DL and UL configuration exists in the RAN4 spec from Rel-15 and RAN2 should have a chance to check the issue discussed in RAN4.

3 – Ericsson LM

Before asking RAN2, RAN4 should agree on the configurations that can be supported from a UE complexity standpoint but not possible to indicate in RAN2 signaling. Our view is that all existing Rel-17 combinations can be supported by existing signaling with removal of the configurations (Case 3), which are not valid.

4 – Guangdong OPPO Mobile Telecom.

Regardless whether new solution is needed or not, we need firstly discuss how does legacy UE/network interpret existing UE capability signaling because otherwise it is not clear how to resolve compatibility issue. Legacy interpretation could be:

Option 1: the concept of contiguous or non-contiguous only relies on DL. It means when UE report it support one specific contiguous(non-contiguous) EN-DC combination, it supports all relevant combinations in table 5.5B.2-1(5.5B.3-1) regardless of uplink status.

Option 2: the concept of contiguous or non-contiguous relies on both DL and UL. It means those highlighted combinations in [1] are not in use in the field hence no ambiguity issue is raised from field.

Since the UE capability *intraBandENDC-Support* simply refer to 38.101-3, it sounds like option 1 is the right one. But the discussion going on in RAN4 gives the impression that actually we can interpret with option 2

5 – Samsung Electronics Co.

It depends on the perception of RAN2 and RAN4, if both groups are not against that the DL contiguous with UL non-contiguous intra-band EN-DC configuration is valid configuration which has operator's request, as well as satisfying the fallback rule, then some solution might be needed in RAN2 to address the

inconsistence issue, i.e., how to configure different state {contiguous, non-contiguous, both} for UL and DL separately. At least, RAN2 should be informed first and we look forward RAN2 provide more insights.

6 – Google Inc.

We think that as long as the UE following the fallback rule, it should not prevent the UE from supporting any DL/UL configurations. We are looking for the solution instead of removing these band combinations and we are also fine to hear the suggestion from RAN2.

7 – Nokia Japan

We agree with it based on an LS from RAN4 if the LS content becomes clear enough and sent to RAN2.

Issue 1.2-3: Do you agree that an LS needs to be sent to RAN2 as drafted in Annex of [1]?

Feedback Form 3: Issue 1.2-3

1 – Apple (UK) Limited

It depends on the outcome of the discussions in Issue 1.2-1 and Issue 1.2-2.

2 – Huawei Technologies France

Yes, we think an LS is necessary to RAN2.

Alternatively, a RAN agreement to task both RAN4 and RAN2 to have further clarification is also fine for us.

3 – Ericsson LM

No. Please see our comments on issues 1-2-1 and 1-2-2.

4 – Guangdong OPPO Mobile Telecom.

it depends on the conclusion of previous two questions

5 – Samsung Electronics Co.

We think the alternative proposed by Huawei is fine, it would be beneficial that both RAN2 and RAN4 have more discussion and clarification since fallback rule has always been a fuzzy zone and RAN4 now is determined to make it clear and have some concrete record for the group reference, jointly conclusion could be made later on this particular case which probably the most tough issue about fallback rule.

6 – vivo Communication Technology

Generally, we welcome the idea of involving RAN2 in the discussion, since this topic has been in RAN4 for some time without progress. RAN2 involvements may help to push some further clarification.

7 – Google Inc. It depends on the conclusion in Issue 1.2-1 and Issue 1.2-2.
8 – Nokia Japan It depends on the content of the LS. RAN4 just asks RAN2 if the current signaling can deal with DC configurations captured in the table 1 or not with the issues RAN4 has identified. And if not, ask them to address it. We don't see the necessity of ACTION 1 and related texts in the LS.

1.2.3 Summary and recommendation for further discussion

Thanks for the input in the initial round on this topic. The moderator summary of each issue presented is as follows.

Issue 1.2-1:

- Yes (5): Apple, Huawei, Samsung, Google, Vodafone
- No (1): Ericsson

In addition, OPPO and MediaTek provided input that indicated that further discussion was necessary in RAN4 or a better understanding of how the RAN2 specs should be interpreted should be the first step. As the responses did not mention about asking RAN2 or not, the input was not counted concerning this issue in the Yes and No status above.

There is a clear indication from Ericsson that Case 3 UL configuration is not valid and would not need any input from RAN2.

Based on the feedback, there is no consensus that RAN should ask RAN2 for clarification on Case 3 specifically.

However, we could consider including it in the list of EN-DC DL and UL configurations as noted in the Issue 1.2-2 summary below since that type of combination exists in the RAN4 specification or wait until RAN4 agrees if the Case 3 configuration should be removed or not.

Issue 1.2-2:

The outcome of Issue 1.2-2 is mixed and there was not really much support for the proposal as written to specifically task RAN2 with anything at this point until RAN4 has more time for discussion on the specific need for a solution or not.

Huawei suggested that, at a minimum, RAN2 should be informed about the different EN-DC DL and UL configurations that exist in the RAN4 specification from Rel-15 to allow RAN2 to have a chance to check the issue discussed in RAN4. Ericsson suggested that RAN4 should first agree on the configurations that can be supported from a UE complexity standpoint but not possible to indicate in RAN2 signaling.

Based on the input on this issue as well as Issue 1.2-1, the moderator proposes that RAN task RAN4 and RAN2 to work on further clarifications concerning the specific EN-DC DL and UL configurations that exist in

the RAN4 specification and the appropriate signalling for *intraBandENDC-Support* for these specific configurations and if the concept of contiguous or non-contiguous in *intraBandENDC-Support* only relies on DL.

No further discussion will be held in the intermediate round specific to Issue 1.2-1 and Issue 1.2-2. The moderator would look for the proponent of [1] (Huawei) and/or other companies to provide their suggestions in the intermediate round for the specific wording for the RAN ask of RAN4 and RAN2 to address in Q42022.

Issue 1.2-3:

As there is no agreement on the previous two issues, it does not seem feasible to agree to an LS to RAN2 at this time. The moderator suggests focusing the remaining discussion on the specific wording for the RAN ask of RAN4 and RAN2 to address in Q42022. No further discussion will be held concerning the draft LS.

1.3 Intermediate Round

The intermediate round will be focused on collecting company views on the moderator proposal to collect feedback on the specific wording for the RAN ask of RAN4 and RAN2 to address in Q42022 concerning the intraBandENDC-Support ambiguities.

1.3.1 Open Issues

The open issue for the intermediate round is identified below.

1.3.2 Collection of company views

Issue 1.3-1: Please provide suggested text for the RAN ask of RAN4 and RAN2 to address in Q42022.

Feedback Form 4: Issue 1.3-1

1 – Apple (UK) Limited

Considering the time and efforts that RAN4 had spent on trying to resolve this issue in the past 22 months, maybe RAN4 should reconsider whether there is any merit or benefit on introducing Case 3 configurations into the specifications. Similar to Ericsson had commented in first round, back in RAN4 #97-e meeting, Apple was the first company who proposed to remove the Case 3 configurations from the specifications (R4-2014914, R4-2014915) as we also considered these are invalid intra-band EN-DC configurations. However, after realizing that some Operator(s) might have interest in operating these configurations, Apple had joined a few other companies on trying to propose potential solutions to retain these configurations and yet to resolve the known ambiguity issue. Unfortunately, after more than one and half years of discussions, RAN4 still could not concede a plausible solution.

On the technical aspect, in our view, non-contiguous UL configuration in general would be much less efficient than contiguous UL configuration due to the potential higher MPR or A-MPR. If in a configuration there are more than two contiguous carriers in the DL, the contiguous UL configuration with two carriers should always be configurable. We wonder what motivates to configure UL as non-contiguous as it is expected to perform worse than contiguous UL. With that being said, we would like to encourage the concerned Operator(s) to rethink whether there would be any merit or benefit to operate Case 3 configurations.

If Case 3 configurations can be removed from RAN4 specifications, it will save RAN4/RAN2 additional time and efforts on trying to resolve this seemingly endless issue. It is also the cleanest way to remove the ambiguity issue in those configurations.

2 – Ericsson LM

As stated by us in initial round, the Case 3 is not valid configuration.

We also agree with Apple that non-contiguous UL configuration is much less efficient than contiguous UL configuration due to higher MPR/A-MPR.

Given that RAN4 has extensively discussed this issue over many meetings, sending LS to RAN2/RAN4 will not help rather it will further consume RAN2/RAN4 time without any outcome.

We therefore also support the idea to remove Case 3 from RAN4 specs. This can be done either by company CR or RAN can task RAN4 to remove Case 3 from RAN4 specs in the next RAN4 meeting.

3 – Guangdong OPPO Mobile Telecom.

we also think the case 3(and also case 4) should be checked right now in this plenary whether they are valid band combination or not at first. If operators confirm to keep them, they should also clarify whether they are in use in the field or not since this is also related to compatibility issue once new solution is needed. In case they are confirmed not useful, then removal from RAN4's table is cleanest solution. In case RAN agree WGs discussion is needed, still this issue should be discussed in RAN4 first then in RAN2 i.e. to check in RAN4 the meaning of fallback from RAN4 point of view at first.

4 – Guangdong OPPO Mobile Telecom.

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5 – vivo Communication Technology

Share Apple's view that removing some of the difficult scenarios would be beneficial, but may need operator's confirmation.

6 – Nokia Japan

If LS is sent to RAN2, we suggest to remove followngs from draft LS in Appendix in RP-222513.

"Besides, in RAN2 TS38.306,....." to "defined in TS38.306 applied to Case 3"

ACTION 1

7 – Huawei Technologies France

We think that spectrum request from operators must have their own deployment consideration. Specifications should take the request into consideration. If some issues are identified already, we think the issue should be resolved among groups. We believe RAN4 is not the group to judge whether the configuration request is valid or not without confirmation from the proponent operator. As the issue has been discussed for almost two years without conclusion and the configurations are still in the spec, we can assume that the operator is well aware of the discussion. In that case, in our view, this inconsistent issue should be discussed in the affected WGs.

Suggestion by Nokia for the revision of the LS is ok for us. The remaining part just reflects the inconsistency observed in RAN4.

We propose to have an agreement in this meeting, i.e. RAN tasks RAN4 and RAN2 to check the inconsistency issue described in rev. RP-222513.

8 – Samsung Electronics Co.

Thanks for Apple's good point, we also would like to hear operator's view with taking Apple's clarification and suggestion into account.

If operator still requests to keep them, more clarification from RAN2 is necessary. From RAN4 aspect, we see no reason that this configuration is invalid, so we prefer to hear RAN2's view on:

"If there is deployment demand from operator, and we see no reason that this configuration is invalid in RAN4 aspect, does RAN2 have concern or difficulty to implement it?

With above consideration, Send LS to RAN2 is ok with us, actually we prefer include both "Action 1 and Action 2". Alternatively, task RAN4 and RAN2 have more discussion in parallel in Q4 is also acceptable to us. At least, two issues should be addressed.

1) Whether configuration in case 3 is valid from RAN4 and RAN2 point of view respectively.

2) In case of configuration in case 3 is confirmed as valid, whether a solution is necessary in RAN2 to address the ambiguity issue for configurations on some intra-band EN-DC band combinations with more than 2 carriers from Rel-15.

1.3.3 Summary and recommendation for further discussion

Thanks for the input in the intermediate round on this topic. Most of the input did not provide suggested text for the RAN ask of RAN4 and RAN2 to address in Q42022 but highlighted the goal of trying to reach agreement at this RAN Plenary that the Case 3 combinations should be removed from the RAN4 specification.

Although the moderator sees a good amount of support to remove the Case 3 combinations or at least continue discussion at this RAN Plenary to try to reach agreement, it seems difficult to achieve this without feedback from the interested operator(s).

At the conclusion of the initial round, it was confirmed that an LS to RAN2 could not be agreed at this RAN Plenary.

The moderator proposes that Huawei produce a revision of RP-222513 to remove the Annex for the proposed LS and to modify the paper to only present the inconsistency issues.

Based on the revision of RP-222513, the moderator proposes the following way forward based on a hybrid approach of the Huawei and Samsung proposed text. The Tdoc number will be updated in the WF once it is available.

- RAN tasks RAN4 and RAN2 to have more discussion in Q4 to check the inconsistency issue described in rev. RP-222513. At least, two issues should be addressed.
  - Whether configuration in Case 3 is valid from RAN4 and RAN2 point of view respectively.
  - In the case of configuration in Case 4 and in case of configuration in Case 3 is confirmed as valid, whether a solution is necessary in RAN2 to address the ambiguity issue for configurations on some intra-band EN-DC band combinations with more than 2 carriers from Rel-15.

During the intermediate round over email, Nokia requested to modify the status for Issue 1.2-1 to remove their name from the summary on this issue. The moderator has made these changes in this latest version of the NWM document.

1.4 Final Round

The final round will be focused on collecting company views on the moderator proposed way forward.

1.4.1 Open Issues

Issue 1.4-1: The moderator proposed way forward is to capture the following in the RAN #97-e meeting minutes based on the revision of RP-222513. The Tdoc number will be updated in the WF once it is available.

- RAN tasks RAN4 and RAN2 to have more discussion in Q4 to check the inconsistency issue described in rev. RP-222513. At least, two issues should be addressed.
  - Whether configuration in Case 3 is valid from RAN4 and RAN2 point of view respectively.
  - In the case of configuration in Case 4 and in case of configuration in Case 3 is confirmed as valid, whether a solution is necessary in RAN2 to address the ambiguity issue for configurations on some intra-band EN-DC band combinations with more than 2 carriers from Rel-15.

1.4.2 Collection of company views

Issue 1.4-1: Please provide your input on the moderator proposed way forward.

Feedback Form 5: Issue 1.4-1

1 – Google Inc.

Thanks for the above comments in the Intermediate Round. For CBRS band b48/n48, the channel allocation is determined by CBRS Spectrum Access System(SAS). There may be a possible scenario that the network is first granted with contiguous 48A-48A-n48A spectrum and then the middle channel 48A would

be turned off by SAS due to Tier-1 incumbent access users or higher interference. When the network gets the notification from SAS, it would be flexible to have the configuration DL DC_(n)48CA with UL DC_48A_n48A and only release the middle channel without LTE UL carrier reconfiguration. Since these band combinations has been existed in TS38.101-3 for a while, we would like to look for a solution instead of removing them. Hence, we are OK to the WF and thanks for the moderator's preparation to the WF.

2 – Google Inc.

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3 – Google Inc.

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4 – Google Inc.

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5 – Google Inc.

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6 – Google Inc.

Sorry for the duplicate comments. Could the moderator help to remove #2 to #5? Sorry for the inconvenience.

7 – Huawei Technologies France

Thanks moderator's proposal for the final round. We support the WF and will revise RP-222513 according to moderator's suggestion to only keep the inconsistency issues.

8 – Guangdong OPPO Mobile Telecom.

whether case 3 and/or case4 is valid or not is up to operators' requirement and we think it should be sufficient to be checked in one working group i.e. RAN4. If case 3 and/or case4 is valid, operators should also indicate whether those relevant band combinations are in use in the field or not. if they are in use then we need consider compatibilit issue otherwise it could be easier for either RAN2 or RAN4 to adopt a solution bearing new interpretation without any backwards compatibility issue. Finally there is no ambiguity for case where DL/UL are both contiguous or non-contiguous. so the concerned band combinations are those covered by either case 3 or case 4. here is rewording suggestion:

RAN tasks RAN4 in Oct. and then RAN2 in Nov. to have more discussion in Q4 to check the inconsistency issue described in rev. RP-222513. At least, **3** issues should be addressed in RAN4:

- Whether configuration in Case 3 and case 4 are valid from RAN4 ~~and RAN2~~ point of view ~~respectively~~.
- In case any of them are valid, whether valid cases are in use in field
- In the case of configuration in Case 4 and/or~~in case of configuration in~~ Case 3 is confirmed as valid, whether a solution is necessary in RAN2 to address the ambiguity issue for configurations on some intra-band EN-DC band combinations of case 3 and/or case 4~~with more than 2 carriers~~ from Rel-15

And for RAN2:

- Based on the conclusion in RAN4, RAN2 further discuss the potential ambiguity issue and figure out solution , if needed.

9 – Samsung Electronics Co.

Thanks for moderator's leading and companies' comment.

Response to OPPO on "In case any of them are valid, whether valid cases are in use in field ": From current RAN2 signalling perspective, we tend to think these configuration are not in use in field given that UE is not allowed to indicate intra-band contiguous/non-contiguous capability in UL, DL separately.

In our view, configuration in case 3 and case 4 are valid in RAN4 aspect and RAN2 is expected to take action to achieve them if no concern and difficulty in RAN2, but we are also fine to hear views from other companies in both RAN4 and RAN2. Hence we propose the text in intermediate round.

We support moderator's WF and have minor modification as follows.

RAN tasks RAN4 and RAN2 to have more discussion in Q4 to check the inconsistency issue described in rev. RP-222513. At least, two issues should be addressed.

- Whether configuration in Case 3 and Case 4~~is~~are valid from RAN4 and RAN2 point of view respectively.

- In the case of configuration in Case 4 and/or in case of configuration in Case 3 is confirmed as valid, whether a solution is necessary in RAN2 to address the ambiguity issue for configurations on some intra-band EN-DC band combinations with more than 2 carriers from Rel-15.

10 – Huawei Technologies France

To OPPO:

We think that it may not be very helpful to task RAN4 only to have further discussion in Oct meeting. With or without RAN task, anyway RAN4 will have further discussion. What matters is whether RAN2 could take the chance to check the cases have been discussed in both RAN4 and RAN. We prefer the original WF by moderator. Adding case 4 for the first bullet is fine for us.

The revised RP-222513 is available in the draft folder, which removes the annex and the proposals in the contribution.

https://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_97e/Inbox/Drafts/%5B97e-34-IntraBand-ENDC-Comb%5D

11 – Apple (UK) Limited

Thanks to Google on clarifying the scenario in CBRS band where Case 3 configuration may be preferred. If we understand correctly, such configuration would only be configured when the network is aware in advance that the middle spectrum may be occupied by Tier-1 incumbent access users from time to time. Otherwise, if the network does not have the prior knowledge on which part of the spectrum would be occupied by Tier-1 incumbent access users, we think it makes more sense to always configure the 2 UL carriers as contiguous when the 3 DL carriers are contiguous. On the other hand, even if it is the former case, we are somewhat skeptical on whether releasing the middle carrier without reconfiguration would work. To our understanding, this is equivalent to LTE SCell deactivation where the DL configuration is still kept as DC_(n)48CA. However, when the middle spectrum is occupied by other network, it may introduce strong blocking signal in the middle carrier. Therefore, despite the UE is capable of supporting non-contiguous DL configuration, it may not be able to handle the strong middle blocker without Rx path reconfiguration which would only take place when the DL is reconfigured from DC_(n)48CA to DC_41A-n41A. With that being said, if reconfiguration by the network is always needed when certain part of the spectrum is occupied by the other network, then it also makes sense to always configure the 2 UL carriers as contiguous when the 3 DL carriers are contiguous.

The same concept also applies to Case 4, meaning that for DC_48A_(n)48AA, it would make more sense to always configure UL as DC_(n)48AA. This is also what has been specified for CA_n48(A-B) in 38.101-1 where only UL CA_n48B is specified, but not CA_48A-48A.

We are open to have more discussions in both RAN4 and RAN2 if there is still strong interest from Operator(s) to deploy these special EN-DC configurations.

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14 – Ericsson LM

In our view there are two main issues:

1) Whether Case 3 and Case 4 configurations are valid scenarios and have relevant use cases.

2) Whether there is signaling support for them in RAN2 specs e.g. whether such capability signaling exists or not for the UE to indicate support for these cases.

Issue 1 is for RAN4 to discuss and decide. RAN2 should not be involved until RAN4 has reached the conclusion. Based on RAN4 outcome, RAN4 can decide whether to ask RAN2 to define signaling or not.

In summary we provide compromise proposal with clear tasks to RAN4 and RAN2 i.e.

- RAN4 to discuss whether Case 3 and Case 4 are configurations valid scenarios.
- RAN2 to inform only whether there is any existing UE capability signaling in current RAN2 specs to signal support for Case 3 and Case 4 configurations.

15 – Nokia Japan

Moderator's WF looks reasonable in principle. But the 2nd sub-bullet needs claification that RAN2 action is triggered by RAN4 LS based on the outcome of the sub-bullet 1 including Case 4.

Overall, the proposal by Ericsson looks also reasoable at this stage.

1.4.3 Summary and recommended conclusion

Thanks for the input in the final round on this topic and to Huawei for providing the draft revised RP-222513. Most of the input was supportive of the moderator proposed way forward with some minor suggested edits from Samsung which seemed reasonable.

Ericsson proposed alternate text to limit the discussion to RAN4 on whether Case 3 and Case 4 configurations are valid scenarios and to limit the RAN2 task to indicating if there is any existing UE capability signalling to support Case 3 and Case 4. In the moderator's view, RAN4 has not concluded on whether Case 3 and Case 4 are valid scenarios for many meetings and that it does not seem detrimental to have RAN2 experts also review the revised document from Huawei which is now only being presented for information at this RAN meeting.

Nokia suggested to modify the second sub-bullet that the RAN2 action is triggered by a RAN4 LS based on the outcome of sub-bullet 1. In this case, the moderator does not think that the RAN task needs to specify the RAN WG activities related to information sharing. The wording in sub-bullet 2 already indicates that the action would not occur until Case 3 and Case 4 are confirmed as valid. Therefore, it seems clear that RAN2 would need RAN4's input on this aspect to proceed.

Using the minor suggested edits from Samsung, the moderator proposes the modified way forward below which I hope is agreeable. The Tdoc number will be updated in the WF once it is available. There will no attempt to collect additional feedback in NWM at this time in any extended round until the RAN Chair confirms if this is required.

Moderator Way Forward:

- **Rev. RP-222513 [2] can be noted.**
- **RAN tasks RAN4 and RAN2 to have more discussion in Q4 to check the inconsistency issue described in rev. RP-222513 [2]. At least, two issues should be addressed.**
  - **Whether configurations in Case 3 and Case 4 are valid from RAN4 and RAN2 point of view respectively.**
  - **In the case of configuration in Case 3 and/or in case of configuration in Case 4 are/is confirmed as valid, whether a solution is necessary in RAN2 to address the ambiguity issue for configurations on some intra-band EN-DC band combinations with more than 2 carriers from Rel-15.**

2 Final Conclusions

The moderator recommendations for the discussion [97e-34-IntraBand-ENDC-Comb] can be found below.

1) The following way forward is asked to be captured in the meeting minutes related to [2].

Moderator Way Forward:

- **RAN tasks RAN4 and RAN2 to have more discussion in Q4 to check the inconsistency issue described in RP-222646 [2]. At least, two issues should be addressed.**
  - **Whether configurations in Case 3 and Case 4 are valid from RAN4 and RAN2 point of view respectively.**
  - **In the case of configuration in Case 3 and/or in case of configuration in Case 4 are(is) confirmed as valid, whether a solution is necessary in RAN2 to address the ambiguity issue for configurations on some intra-band EN-DC band combinations with more than 2 carriers from Rel-15.**

2) The following conclusions can be taken on the Tdocs.

Document [2] can be noted.

3 References

[1] RP-222513: Discussion on intra-band EN-DC combination; Huawei, Hisilicon

[2] RP-222646: Discussion on intra-band EN-DC combination; Huawei, Hisilicon