[95e-09-RAN4-R18-BandComb] - Version 0.0.8
RAN

3GPP TSG-RAN Plenary Meeting # 95-e RP-220869

Electronic Meeting, Mar 17th – Mar 23rd, 2022

Agenda item: 9.1.4

Source: Moderator (ZTE)

Title: Email discussion summary for [95e-09-RAN4-R18-BandComb]

Document for: Information

1 Introduction

List of contributions treated in this thread:

Table 1:

TDoc	Title	Source	Moderator's remarks
RP-220024	Moderator's summary for discussion [RAN95e-RAN4-R18Prep-06] Other RAN4 Enhancements	RAN4 chair (Huawei)	Initial objectives captured for the SI.
RP-220058	New SI: Simplification of band combination specification	RAN4 chair (Huawei)	SI proposal with justifications and objectives according to Pre-RAN#95e discussions.
RP-220168	Motivation on simplification of band combination specification	ZTE Corporation	Motivation of the SI. Rel-17 left issues Not optimized specs organization currently Overlapping efforts among different basket WIDs Redundancy in the current specs

RP-220169	New SID on simplification of band combination specification	ZTE Corporation	SID proposal. Adding [] for reducing test configurations for MSD, subject to the outcome of the extended Rel-17 BCS4 works
RP-220187	View of RAN4 Rel-18 package	OPPO	Support the item "Simplification of band combination specification"
RP-220212	Brief views on RAN4 Rel-18 package	Xiaomi	For "Simplification of specification": Ok with current objectives in the email summary RP-220024
RP-220579	Views on RAN4 Rel-18 package	China Telecom	Support to at least have: One SI on Simplification of band combination specification
RP-220592	Views on RAN4 Rel-18 Package	vivo	The following working scope should be included in Rel-18 RAN4 package Simplification of band combination specification (SI)
RP-220725	Consideration and motivation for Rel-18 new SI on simplification of band combination specification	Huawei, HiSilicon	Motivations: Further optimization and improvement of the working procedure to specify a huge number of band combos and configurations Investigation on the dependency and applicability for RF requirements among different features for the same spectrum combination to reduce the redundant tests.
RP-220757	MediaTek Views on RAN4 package	MediaTek Inc.	Simplification of band combo specification • Needed

2 Topic #1: Justification and motivations

2.1 Initial round

Justification texts:

Table 2:

Firstly, the huge number of band combinations and configurations with different downlink CC numbers and uplink CC numbers configured are specified since Rel-15. RAN4 spent lots of time to introduce band combinations following the current working procedure. It can be observed that the further optimization and improvement of the working procedure would be useful in order to improve the efficiency to specify band combinations and the quality of specifications. And the current procedure also results in a lot of errors and workload like reviewing and flagging the documents with errors. The process can only be simplified to improve the efficiency if we develop guideline, rules and tools to ensure good quality of the submitted contributions. Secondly, in the current specifications, the UE RF requirements are specified per feature (e.g., CA, DC, EN-DC, SUL) for a band combination (e.g., band A+B+C). But most of RF requirements depend on which spectrum are combined, how many Tx antennas are used, and on which spectrum UL will be transmitted, and are independent of those above features. As a result, there would be redundancy during the verification of RF requirements for a combination of bands. Currently, the UE needs to pass the similar CA and EN-DC RF requirements on the same combination of bands, e.g., CA_nA-nB, EN-DC_A_nB, EN-DC_B_nA, where A and nA correspond to the same spectrum for LTE and NR separately. But the RF implementation under the verification for CA and EN-DC would be the same. It's better to investigate the dependency and applicability for RF requirements among different features for the same spectrum combination to reduce the redundant tests. Thirdly, in the current specification, most of RF requirements are band combination specific except for MSD. It's better to study methodology to simplify RF requirements specifications for MSD requirement to reduce the test configurations with different bandwidth combinations. For the other band specific RF requirements including Delta_TIB, Delta_RIB and Delta_TC,c, it's better to further optimize the specification structure.

2.1.1 Companies views' collection for initial round

Issue 1-1: Do you have any comment on the justification texts?

Feedback Form 1: Comment collections on Issue 1-1

1 – Apple (UK) Limited We support the efforts on band combinations simplification in technical specifications to minimize the RAN4 workload and improve the CR process efficiency on introducing new band combinations.
2 – LG Electronics Deutschland We think the texts are clear enough to justify this SI.

3 – Ericsson LM Looks fine.
4 – Huawei Technologies Sweden AB Support the SI with the aim not only to focus on improving the quality of spec, but also to reduce the test burden. Justification text looks ok.
5 – VODAFONE Group Plc Echo Apple's comment.
6 – China Unicom We support the justification text.
7 – AT&T GNS Belgium SPRL We support the proposed text for the justification.

2.1.2 Summary for initial round

Issue 1-1 on justification texts:

Justification texts look sufficient and stable.

No further discussion in the intermediate round.

2.2 Intermediate round (if applicable)

2.2.1 Companies views' collection for intermediate round

2.2.2 Summary for intermediate round

2.3 Final round (if applicable)

2.3.1 Companies views' collection for final round

2.3.2 Summary for final round

3 Topic #2: Objectives

3.1 Initial round

Table 3:

- Investigate and simplify the working procedure for approving documents for TS and TR to improve the efficiency to specify band combinations and the quality of specifications
    - Improve the efficiency considering
        - RAN4 reduces the redundant and unnecessary work for big CRs, draft CRs and/or TPs, if any
        - The following rules will be investigated and defined if necessary
            - Investigate whether the workflow can be improved under the condition that quality can be guaranteed.
            - Develop rules or guidelines covering the process of not for block approval.
        - Develop the necessary tools to reduce RAN4's workloads if feasible
    - Improve the quality considering
        - RAN4 improves the procedures for cross-checking to avoid conflict between big CR/CRs across basket WIs and other WIs
    - RAN4 captures the agreements about the rules and guidelines including <u>but not being limited to</u> the outcome of the above sub-bullets in the corresponding TR
- Investigate the feasibility and optimize the specification structure and reduce the test burden
    - Study the methodology to simplify the test efforts for a UE supporting multiple features, e.g., NR-CA, EN-DC on the same band combination
        - Study of similarity and dependency of RF requirements for different features on the same band combination
    - Study the methodology to simplify RF requirement specifications for
        - [MSD requirements in 38.101-1 and 38.101-3, e.g., reducing the test configurations with different bandwidth combinations]
        - For Delta_TIB and Delta_RIB requirements, investigate and define the framework of the general principle or requirements with band-combination specific exceptions
        - For Delta_TC,c, investigate whether it can be removed in low boundary formula for Pcmax
- NOTE 1: The requirements applicable to UE won't be increased.
- NOTE 2: The work should be applied to all the power classes

Issue 2-1: Do you have any comment on the objectives?

Feedback Form 2: Comment collection on Issue 2-1

1 – Skyworks Solutions Inc.

On: Develop rules or guidelines covering the process of not for block approval. the ultimate goal would be to evolve the block approval templates to cover those cases and move back to block approval the BC types that have stable specification framework and added section in block approval TP templates.

2 – T-Mobile USA Inc.

Under ”Improve the efficiency considering,” we propose to add the following bullet:

RAN4 to investigate if it is necessary to define BCSs for inter-band NR-CA and NR-DC combinations with FR1 and FR2 bands since no RF requirements are defined for FR1+FR2 combinations. RAN4 workload could potentially be reduced by using the FR1 and FR2 BCSs, but capability signaling changes may be required.

3 – Apple (UK) Limited

Maybe it is sufficient to list the high-level objectives at this stage. The details can be left in the SI phase. Here are a few suggestions:

1. TP/CR process efficiency improvement
2. Technical specifications simplification
   - Editorial improvement (table format changes, better grouping, reconsideration of Excel based documentation, etc.)
   - Technical contents reduction without losing requirements coverage, such as MSD due to UL harmonics, harmonic mixing, and cross-band isolation test points reduction
3. Test efforts optimization
   - May be better handled by RAN5

4 – Beijing Xiaomi Mobile Software

We support all the objectives, including the contents in the bracket. i.e. [MSD requirements in 38.101-1 and 38.101-3, e.g., reducing the test configurations with different bandwidth combinations].

5 – Qualcomm Incorporated

In general, the scope of this SI should focus on the efficiency improvement, quality improvement and specifications simplification. This is a SI and it should not change the current requirements. Agree with Apple that it is better to consider the test efforts reducing in RAN5 and this might lead to core requirements change.

For NOTE1, we suggest to making the following change:

NOTE 1: The requirements applicable to UE won't be changed and increased.

6 – LG Electronics Deutschland

This SI is targeting to improve the procedure, efficiency and reduce the test burden of UE supporting CA/DC so we are supportive of most of the objectives listed here.

7 – ZTE Corporation

To Skyworks:

In Rel-17, non-block approval was discussed separately with block approval, and some rules were developped. Whether or not the block approval tempalte can cover the non-block approval could be discussed in this Rel-18 SID. Any new rules related to non-block approval are not precluded.

To T-mobile USA.

It may impossible to list all the specific issues in the SID and it is not a efficient. Actually, some concrete issues are listed here for example *reduces the redundant and unnecessary work for big CRs, draft CRs and/or TPs, if any*, which is important for the simplification of the RAN4's work, this issue is severe for band combination work.

Actually, this SID will not exclude any other possible issues, we have this one: *RAN4 captures the agreements about the rules and guidelines including but not being limited to the outcome of the above sub-bullets in the corresponding TR*. So the issue proposed by T-mobile USA can be still discussed in Rel-18 if needed.

To Apple:

Thanks for your good suggestions.

We understand your points on the high level but it will large modify the original objectives which were discussed for a long time.So we think it may not proper to do it. In the corresponding Rel-17 SID, 'high level' method was adopted. After long discussion in Rel-17, lots of issues were solved, but there are still lots of issues may need to be resolved in Rel-18. In this Rel-18 SID, some issues such as *'redundant and unnecessary work for big CRs, draft CRs and/or TPs'* were found and needed to be solved in Rel-18, so in the objectives, some specific problems were listed here for the clear purpose.

Of course, there may exist some other issue which were not listed here, and there is a bullet to cover it.

RAN4 captures the agreements about the rules and guidelines including but not being limited to the outcome of the above sub-bullets in the corresponding TR

For the RAN5 issue, it was discussed before, it should be triggered by LS-based approach, that is no RAN5 as secondary group included. I copy &paste the Xizeng's reply last time for your convenience:

Regarding whether RAN5 should be involved or not, there was no consensus. In the moderator's view, RAN4 can send LS to RAN5 if needed, which is a usual business. Thus moderator suggests not to have any secondary working group for this SI.

To QC:

Changing and increasing requirements are not the intention of this SID, instead simplification the band combination specification. So we are fine to add note 1.

8 – vivo Communication Technology

We are supportive for the objectives. it's valuable to simplify the test efforts for UEs support multiple features.

9 – Deutsche Telekom AG

We see that avoiding defining BCSs for FR1+FR2 combinations could save a lot of RAN4 work. We should investigate if new signalling would be needed to indicate separate BCS for FR1 and FR2, or if BCS shall only applies to FR1.

10 – Ericsson LM

We are fine with the objectives.

We support the view from T-Mobile US that it is worth investigating if we really need to define BCS's for band combinations with FR1 and FR2 bands. So our preference is to add the objective proposed by T-Mobile US in the first comment.

But as suggested by ZTE if it is common understanding that such details are part of the scope of R18 SID then it is also OK not to explicitly list all details. The key point is that RAN4 should be able to investigate this issue.

11 – VODAFONE Group Plc

We support the objectives. Any opportunity to simplify, optimise and improve the procedure for specifying band combinations is welcome.

12 – China Unicom

We are fine with the objectives.

13 – AT&T GNS Belgium SPRL

We are OK with the objectives but also agree with Qualcomm that it should be clarified that there is no intent to modify existing UE requirements. We also support the proposal from Apple to leave the test effort optimization to RAN5.

Issue 2-2: Since reducing test configurations for MSD requirements is still discussed under Rel-17 BCS4 WID which is supposed to be extended to June 2022, do you agree to put square brackets for this sub-objective?

Feedback Form 3: Comment collection on Issue 2-2

1 – Qualcomm Incorporated OK to keep this objective as square brackets. But again, we should make sure it will not change the current requirements.
2 – ZTE Corporation Actually the reducing test configurations for MSD requirements were triggered and discussed under Rel-17 BCS4 WID, and Rel-17 BCS4 WID will be extend one quarter to solve this problem, so the discussion will continue in May meeting. As discussed under Rel-17 BCS4 WID, companies will try to solve and complete this discussion in May meeting. So here we put [] for this objectives.
3 – Ericsson LM It is fine to put in brackets.
4 – Huawei Technologies Sweden AB OK to keep this objective in brackets.

3.1.1 Companies views' collection for initial round

3.1.2 Summary for initial round

Issue 2-1 objectives:

The current objectives are fine, and there are also several concerns raised during the initial round discussion:

- Concern 1: Develop rules or guidelines covering the procedures for non-block approval
  - This is covered by the sub-objective "RAN4 captures the agreements about the rules and guidelines including but not being limited to the outcome of the above sub-bullets in the corresponding TR" thus could be discussed within this SID.
- Concern 2: Separate BCSs for inter-band CA/DC for the FR1+FR2 band combos.
  - This can be covered by the sub-objective "RAN4 captures the agreements about the rules and guidelines including but not being limited to the outcome of the above sub-bullets in the corresponding TR", and is not explicitly listed in the SID.
- Concern 3: RAN5 involvements on test effort reduction
  - Following RAN4's recommendation on triggering RAN5's work by LS from RAN4 to RAN5 as usual.
- Concern 4: Revise Note 1 to avoid core requirements change

- Change Note 1 to “NOTE 1: The requirements applicable to UE won’t be changed or increased.”

Issue 2-2 square brackets for the the sub-objective on test configuration reduction for MSD requirements:

  - Keep square brackets for the sub-objective on test configuration reduction for MSD requirements.
  - No more discussion in the intermediate round.

3.2 Intermediate round (if applicable)

With the discussions and clarification in the initial round, the justification and objectives are stable.

Issue 2-3: Are the current justification and objectives agreeable where Note 1 is revised to: “The requirements applicable to UE won’t be changed or increased”?

- **Option 1: Yes**
- **Option 2: No, please provide your suggested revision on the objectives.**

3.2.1 Companies views’ collection for intermediate round

Feedback Form 4: Comment collection on Issue 2-3

1 – AT&T GNS Belgium SPRL We support Option 1.
2 – ZTE Corporation Option 1 is fine to us.
3 – CATT Option 1 is fine for us
4 – vivo Communication Technology We are OK with Option 1
5 – Qualcomm Incorporated Support option 1
6 – China Unicom Option 1 is fine for us.

7 – VODAFONE Group Plc We support option 1.
8 – Ericsson LM Option 1 is OK
9 – China Mobile Com. Corporation Support option 1.

3.2.2 Summary for intermediate round

Unanimous consensus on Option 1 on agreeing the justification texts and revised objectives, and the SID is ready for approval. No further discussion in the final round.

Proposal: Revise RP-220169 with the agreed justification texts and objectives where Note 1 is updated as ”The requirements applicable to UE won’t be changed or increased”, and approve the SID in this plenary.

The revised version can also be found at:

https://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_95e/Inbox/Drafts/%5B95e-09-RAN4-R18-BandComb%5D/RevisionOfRP-220169%20–%20New%20SID%20on%20simplification%20of%20band%20combination%20specification_r1.docx

3.3 Final round (if applicable)

3.3.1 Companies views’ collection for final round

For the TU, it is initially suggested in RP-220169 as below:

R1	R2	R3	R4RF	R4RD	RAN	R1	R2	R3	R4RF	R4RD	R1	R2	R3	R4RF	R4RD	RAN	R1	R2	R3	R4RF	R4RD	RAN	R1	R2	R3	R4RF	R4RD	R1	R2	R3	R4RF	R4RD	RAN
110	119	117	104	104	97 Sep. 22	110bis	119bis	117bis	104bis	104bis	111	120	118	105	105	98 Dec 22	112	121	119	106	106	99 March 23	112bis	121bis	119bis	106bis	106bis	113	122	120	107	107	100 June 23
			0.5						1					1						1						1					1		

Figure 1: TU budget

The updated TU budget according to Chair’s latest guideline could be found in https://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_95e/Inbox/Drafts/%5B95e-09-RAN4-R18-BandComb%5D/RP-20xxxx_Revised_SID_FS_SimBC_Time_budget_request_r1.xls.

Feedback Form 5: Comment collection on the proposed TU budget

In order to facilitate indication of supporting the SID, please kindly comment below if you would like to be listed as one of the supporting companies.

Feedback Form 6: If you would like to be listed in the supporting companies, please kindly comment here.

1 – Qualcomm Incorporated Please add ”Qualcomm Incorporated” to the supporting company list.
2 – Beijing Xiaomi Mobile Software Please include “Xiaomi” in the supporting company list.
3 – Apple (UK) Limited Please add ”Apple Inc.” to the supporting company list.
4 – SoftBank Corp. Please add ”SoftBank Corp.” to the supporting company list.
5 – LG Electronics Deutschland Please add ”LG Electronics” as the supporting company
6 – China Unicom Please add China Unicom as supporting company.
7 – VODAFONE Group Plc Please add Vodafone as a supporting company.
8 – AT&T GNS Belgium SPRL Please add AT&T as a supporting company.

3.3.2 Summary for final round

Proposal: Approve the SID RP-220956 in this plenary.