**3GPP TSG-RAN WG4 Meeting # 102-e R4-2206340**

**Electronic Meeting, February 21 – March 3, 2022**

**Agenda item:** 11.3

**Source:** Moderator (ZTE)

**Title:** Email discussion summary for [102-e][140] FS\_BC\_handling

**Document for:** Information

# Introduction

*In this email discussion we will handle following contributions submitted in AI 11.3: Study on band combination handling in RAN4 [SID: FS\_NR\_ENDC\_combo\_rules].*

*Following four (sub-)topics are discussed in this summary:*

* *Topic #1: General and TR*
  + - *R4-2203987, R4-2204010*
* *Topic #2: Information of rules and guidelines of specifying band combinations (TP format, notation, band configurations, BCS)*
  + - *R4-2204760, R4-2205666, R4-2205707, R4-2205708*
* *Topic #3: Improving RAN4 specification structures and reducing redundant contents*
  + *Sub-topic #3-1 Optimization of delta TIB and delta RIB*
    - *R4-2204011, R4-2204785*
  + *Sub-topic #3-2 Optimizations to other redundancy*
    - *R4-2204005, R4-2204009*

*List of candidate target of email discussion for 1st round and 2nd round*

* 1st round: To collect the companies’ views on each topic.
* 2nd round: Try to reach agreements and handle WF if needed.

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| **Reference** | **TDoc** | **Title** | **Source** |
| [1] | **R4-2203987** | TR 38.862 V060 Band combination handling | ZTE Corporation |
| [2] | **R4-2204005** | Further discussion on simplification for DC configuration table in Rel-18 | ZTE Corporation |
| [3] | **R4-2204009** | TP to TR 38.862 on simplification for EN-DC and NE-DC configuration tables | ZTE Corporation |
| [4] | **R4-2204010** | TP to TR 38.862 on symbols and abbreviations | ZTE Corporation |
| [5] | **R4-2204011** | TP to TR 38.862 on template of delta TIB and RIB tables | ZTE Corporation |
| [6] | **R4-2204760** | Update template for Rel-18 NR CA and SUL band combinations | ZTE Corporation |
| [7] | **R4-2204785** | TP to TR 38.862: Statistics of dTib and dRib | Nokia, Nokia Shanghai Bell |
| [8] | **R4-2205666** | TP to TR38.862 on BC not for block approval and guidelines on single band UL configurations using intra-band UL CA | Skyworks Solutions Inc. |
| [9] | **R4-2205707** | TP to 38.862 on that higher order TP(s) are pending approval of fallback(s) | Ericsson |
| [10] | **R4-2205708** | TP to 38.862 on rule about not merging cells in CA configuration tables | Ericsson |

# Topic #1: General and TR

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2203987 | ZTE Corporation | TR 38.862 v060 Band combination handling |
| R4-2204010 | ZTE Corporation | In this proposal, a TP to add symbols and abbreviations into the TR is proposed.  **Proposal 1: It is suggested to adopt the following TP for symbols and abbreviations in TR 38.862.** |

## Open issues summary

*Before e-Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

### Sub-topic 1-1 Draft TR 38.862

*Sub-topic description: This sub-topic is to discuss the content of the draft TR 38.862 v060 based on the agreed TPs in RAN4#102-e.*

**Issue 1-1A: TR 38.862 v060**

*No open issues and candidate options before e-meeting.*

### Sub-topic 1-2 Add symbols and abbreviations into TR 38.862

*Sub-topic description: This sub-topic is to add the symbols and abbreviations used in TR 38.862.*

*Open issues and candidate options before e-meeting:*

**Issue 1-2A: Is the TP in R4-2204010 for symbols and abbreviations acceptable?**

* Proposals
  + Option 1: Yes.
  + Option 2: No (Please provide some reasons).
  + Option 3: Others.
* Recommended WF
  + TBA

## Companies views’ collection for 1st round

### Open issues

* **Sub topic 1-1 Draft TR 38.862**

*Issue 1-1A*: TR 38.862 v060

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| **Company** | **Comments** |
| *Moderator* | *[Moderator Note] The TR V060 which intends to include the approved TPs in RAN4#102-e is reserved for email approval after the meeting. No open issue for 1st round discussion.* |

* **Sub topic 1-2 Add symbols and abbreviations into TR 38.862**

*Issue 1-2A*: Is the TP in R4-2204010 for symbols and abbreviations acceptable?

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| **Company** | **Comments** |
| ZTE | Option 1. |
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### CRs/TPs comments collection

*For close-to-finalize WIs and maintenance work, comments collections can be arranged for TPs and CRs. For ongoing WIs, suggest to focus on open issues discussion on 1st round.*

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| **CR/TP number** | **Comments collection** |
| R4-2204010 | ZTE: See above. |
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## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

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|  | **Status summary** |
| **Sub-topic #1-1** | *Tentative agreements:*  *TR v060 is for email approval to capture the agreed TPs in this meeting. No discussion in the first round.*  *Candidate options:*  *Recommendations for 2nd round:*  *No discussion is needed in the 2nd round.* |
| **Sub-topic #1-2** | *Tentative agreements:*  *Since no comments received, the TP is suggested to be approved.*  *Candidate options:*  *Recommendations for 2nd round:*  *No further discussion is needed in the 2nd round.* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provides recommendation on CRs/TPs Status update.*

*Note: The tdoc decisions shall be provided in Section 3 and this table is optional in case moderators would like to provide additional information.*

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| **CR/TP number** | **CRs/TPs Status update recommendation** |
| R4-2203987 | *For email approval* |
| R4-2204010 | *Agreeable* |

## Discussion on 2nd round (if applicable)

# Topic #2: Information of rules and guidelines of specifying band combinations (TP format, notation, band configurations, BCS)

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2204760 | ZTE Corporation | ***Proposal: Approve the update template for NR CA and SUL band combinations.***  1. The ‘Cover sheet’ are keep unchanged, due to the details on Rel-18 basket WID are unclear, it would need to be updated further if the details are clear.  2. The following sheets are keep unchanged:   * ‘Band combination table’, * ‘FR1 Intra-band CA BCS table’, * ‘FR2 intra-band CA BCS table’, * ‘FR2 intra-band NCCA BCS table’, * ‘Intra-band ENDC BCS table’   3. The following sheets are updated:   * ‘FR1 inter-band BCS table’ * ‘FR2 inter-band BCS table’ * ‘FR1+FR2 inter-band BCS table’ * ‘SUL band combination BCS table’ |
| R4-2205666 | Skyworks Solutions, Inc. | In this contribution we provide the suggested texts and TR re-organization to introduce the aspects pertaining to band combinations not for block approval.  **Proposal on TR structure:**   * **Add a section “6.2.1.2 The workflow on introduction of band combinations not for block approval”. This section covers band combinations not valid and band combinations not for block approval in Release 17.** * **Modify Figure 6.2.1.1-1 to include the band combinations not valid or not for block approval in release 17. The figure may be promoted to before section 6.2.1.1 to represent the whole band combination work flow.** * **Add a section “7.3 Guidelines on introduction of intra-band combinations including intra-band ULCA in their UL configurations”. Sub-sections will cover the two cases: single band UL IMD related MSD and dual band UL triple beat related MSD.** |
| R4-2205707 | Ericsson | This contribution is a text proposal for TR 38.862 on that higher order TP(s) are pending approval of fallback(s). |
| R4-2205708 | Ericsson | This contribution is a text proposal for TR 38.862 TP on a rule about not merging cells in CA configuration tables. |

## Open issues summary

*There are four Tdocs submitted in this topic which are related to the rules and guidelines of specifying band combinations. One is for updating the template for NR CA and SUL band combinations. One is for the rules and related frameworks of band combinations not for block approval. The other two are related to the rules of higher order TPs and the merging cells in CA configuration tables.*

### Sub-topic 2-1 Update the template for NR CA and SUL band combinations

*Sub-topic description: R4-2204760 is to provide an update template for NR CA and SUL band combinations to TR 38.862.*

*The latest template for Rel-17 EN-DC, NR CA and SUL band combination could be found at the website:* [*https://www.3gpp.org/ftp/tsg\_ran/WG4\_Radio/Templates*](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/Templates.), *which is* *R4-2016936.*

*The following rules are suggested to be applied to the template of ‘FR1 inter-band BCS table’, ‘FR2 inter-band BCS table’, ‘FR1+FR2 inter-band BCS table’ and ‘SUL band combination BCS table’:*

- *Merging all the channel bandwidth columns into one column.*

- *Using ‘,’ between two adjacent channel bandwidths.*

- *Removing the channel bandwidth number in the table head.*

- *(Only for inter-band NR CA) Using simple texts like ‘CA\_nXC\_BCS0’ or ‘CA\_nX(2A)\_BCS0’ for the constitute band supporting intra-band contiguous or non-contiguous CA , respectively, associated with a new note of “The CA configurations are given in Table 5.5A.1-1 or Table 5.5A.2-1 in this specification”.*

*Open issues and candidate options before e-meeting:*

**Issue 2-1A: Is the update template for NR CA and SUL band combinations acceptable?**

* Proposals
  + Option 1: Yes.
  + Option 2: No (Please provide some reasons).
  + Option 3: Others.
* Recommended WF
  + TBA.

### Sub-topic 2-2 Rules for band combinations not for block approval

*Sub-topic description: R4-2205666 is to provide a TP to capture the agreements in “band combinations not for block approval”. TR re-organization for this aspect is also suggested.*

*Open issues and candidate options before e-meeting:*

**Issue 2-2A: Is the content in R4-2205666 for the new section “6.2.1.2 Band combinations not valid or not for block approval in release 17” acceptable?**

* Proposals
  + Option 1: Yes.
  + Option 2: No (Please provide some reasons).
  + Option 3: Others.
* Recommended WF
  + TBA.

**Issue 2-2B: Is the content in R4-2205666 for the new section “7.3 Guidelines on introduction of band combinations with intra-band ULCA in UL configuration” acceptable?**

* Proposals
  + Option 1: Yes.
  + Option 2: No (Please provide some reasons).
  + Option 3: Others.
* Recommended WF
  + TBA.

**Issue 2-2C: Does it need to modify the Figure 6.2.1.1-1 in TR 38.862 to include the band combinations not valid or not for block approval? If yes, in which section to include the modified Figure?**

* Proposals
  + Option 1: Yes, modify the Figure 6.2.1.1-1 and set a common section to include it.
  + Option 2: No, no need to modify the Figure 6.2.1.1-1 or just have a new Figure in Section 6.2.1.2 for “not valid or not for block approval”.
  + Option 3: Others.
* Recommended WF
  + TBA.

### Sub-topic 2-3 Rules of higher order TPs and merging cells in CA configuration tables

*Sub-topic description: R4-2205707 is to provide a TP to TR 38.862 on the rules of higher order TPs which are pending approval of fallbacks. R4-2205708 is to provide a TP for not merging cells in CA configuration tables.*

*Open issues and candidate options before e-meeting:*

**Issue 2-3A: Is the rule for higher order TPs which are pending approval of fallbacks acceptable?**

* Proposals
  + Option 1: Yes.
  + Option 2: No (Please provide some reasons).
  + Option 3: Others.
* Recommended WF
  + TBA.

**Issue 2-3B: Is the rule for not merging cells in CA configuration tables acceptable?**

* Proposals
  + Option 1: Yes.
  + Option 2: No (Please provide some reasons).
  + Option 3: Others.
* Recommended WF
  + TBA.

## Companies views’ collection for 1st round

### Open issues

* **Sub topic 2-1 Update the template for NR CA and SUL band combinations**

*Issue 2-1A*: Is the update template for NR CA and SUL band combinations acceptable?

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| **Company** | **Comments** |
| T-Mobile USA | Is there any practical reason to specify FR1+FR2 BCSs in 38.101-3other than the currently signalling only indicates one BCS per band combination? Since there is no MSD analysis for FR1+FR2, it seems like FR1+FR2 BCSs aren’t really necessary, and not a great use of RAN4’s time. Currently all the BCSs defined for FR2 NR CA combinations are BCS0. There are probably existing devices that use the FR1+FR2 BCS so it is probably too late to eliminate them now. But what if we stopped adding new ones and changed the way BCSs are signalled for NR-CA and NR-DC combinations with FR1+FR2? Here are two options:  Option 1: Signal the BCS for FR1 separately from the BCS for FR2. This would require at least one new capability IEs for FR2. If the new FR2 IE is present, then it would indicate that the existing BCS IE would be for the FR1 BCS in 38.101-1.  Option 2: Since the FR2 BCS is most likely to be BCS0, a new bit could be introduced to indicate if the BCS signalled for FR1+FR2 combinations was an FR1+FR2 BCS from 38.101-3, or an FR1 BCS from 38.101-1. |
| ZTE | So far there were no MSD defined for FR1+FR2 combs, however, we are not sure if it is true forever, as we know, the frequency range of FR1 and FR2 may be extend in future. Also all of the existing FR1+FR2 combs so far are for the ≤5GHz FR1 band and >24GHz FR2 band, and one of the agreements was:  *For FR1+FR2 TDD-TDD band combination, the simultaneous Rx/Tx capability is mandatory for band combination with FR1 bands up to 5GHz and FR2 bands above 24GHz. Whether the FR1 bands can be extended to 7.125GHz is FFS until there are such FR1+FR2 band combinations available in RAN4.*  For the two options proposed by T-USA, RAN4 never discuss it before. Also the current IE *supportedBandwidthCombinationSet* is per BC signaling, which is defined the supported bandwidth combination set for a band combination as defined in TS 38.101-1, TS 38.101-2 and TS 38.101-3.  Therefore, if removing the BCS for FR1-FR2, then it would conflict with RAN2 signaling. So in our view, keep BCS for FR1-FR2 inter-band CA although it is conservative. |
| CHTTL | Yes, anyway the template needs to be aligned with the spec. |
| Huawei | Option 3. The update for ‘FR1 inter-band BCS table’, ‘FR2 inter-band BCS table’, ‘FR1+FR2 inter-band BCS table’ and ‘SUL band combination BCS table’ can be acceptable. However, the template should be further updated based on the approved R18 basket WIs. And the R18 basket WIs will be approved in June RAN plenary meeting. That means RAN4 still have one quarter to discuss the template in May RAN4 meeting. |
| Qualcomm | In general, we are OK with the option 1. But the template should align with the approved Rel-18 basket. For FR1+FR2 BCS, this is no need for the current stage, but we are OK to keep it in the template now. |
| ZTE | As we explained in the Tdoc:  1. The ‘Cover sheet’ are keep unchanged, due to the details on Rel-18 basket WID are unclear, it would need to be updated further if the details are clear.  So i think it was already address HW’s and QC’s concern.  Our intention is to foucs on these four sheets in this meeting: ‘FR1 inter-band BCS table’, ‘FR2 inter-band BCS table’, ‘FR1+FR2 inter-band BCS table’ and ‘SUL band combination BCS table’. |
| Samsung | Option1 |
| Skyworks | Why the template needs cover cases that can be currently introduced directly with CRs? It should be part of the guidelines. I don’t think it is needed to speculate on future cases, we can derive the guidelines and template at the time. As stated by other companies the template will have to evolve to encompass new R18 cases or even cases that are currently not for block approval could be added once a stable specification frame work is available. |
| AT&T | In general, we are OK with Option 1 and share the same view as QC the template needs to be aligned with the approved Rel-18 baskets before formal endorsement. In addition, the timeline for use identified in the Word document may need to be adjusted based on the RAN4 Chair’s proposal to extend the Rel-17 baskets until June. |

* **Sub topic 2-2 Rules for band combinations not for block approval**

*Issue 2-2A*: Is the content in R4-2205666 for the new section “6.2.1.2 Band combinations not valid or not for block approval in release 17” acceptable?

*Issue 2-2B*: Is the content in R4-2205666 for the new section “7.3 Guidelines on introduction of band combinations with intra-band ULCA in UL configuration” acceptable?

*Issue 2-2C*: Does it need to modify the Figure 6.2.1.1-1 in TR 38.862 to include the band combinations not valid or not for block approval? If yes, in which section to include the modified Figure?

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| **Company** | **Comments** |
| Nokia | *Issue 2-2A*:Yes  *Issue 2-2B*:Yes  *Issue 2-2C*:Yes |
| T-Mobile USA | *Issue 2-2A*:Yes  *Issue 2-2B*:Yes  *Issue 2-2C*:Yes |
| ZTE | *Issue 2-2C*:  We think not only the Figure 6.2.1.1-1 need to modify, but also the text contents above the Figure 6.2.1.1-1 (i.e. the workflow) are needed to be updated.  The question is the Figure 6.2.1.1-1 in the TR is not editable, also it depends on the contents above. So we are wondering whether it is ok to delete figure 6.2.1.1-1, just only update the text contents. Otherwise, this Figure may need to be updated again and again as long as the procedures are changed. |
| CHTTL | *Issue 2-2A*: In general ok, just wonder whether “not for block approval” is targeting to be applied for Rel.17 only or also for the future releases. |
| Huawei | Issue 2-2A:  I don’t think “the figure 6.2.1.1-1 should be modified to reflect the “not valid” and “not for block approval” aspects in workflow”, since it’s only the workflow for block approval band combinations. In new section 6.2.1.2, it’s just clarified that which band combinations are not for block approval.  For the band combinations which are not valid in release 17, in my understanding, these band combinations can’t be handled by basket WIs in both block approval and non-block approval procedures. But it’s still allowed to introduce these band combinations by a dedicated WI based on RAN plenary’s discussion. It should be clarified in the new section.  Sub-clause number 6.2.1.1.1 and 6.2.1.1.2 should be changed into 6.2.1.2.1 and 6.2.1.2.2.  Issue 2-2B:  There are two formula for IMD order calculation. Please clarify the difference between them. What does the gap mean? And how about the other variables? Some examples are appreciated,  “The IMD order can be calculated for contiguous UL CA: IMD order = 2\*ceil(Gap/maxUL aggregated BW)+1”  “The IMD order can be calculated for contiguous UL CA: IMD order = 2\*ceil(Gap/min(BW separation class, UL band bandwidth)+1”  For the exemplary combination CA\_n1(2A)-n3-n34, band n3 can be removed due to no impacts on this band. We can only consider the fallback combination CA\_n1(2A)-n34.  For CA\_n25A-n41C, the fc for n41C are 2545 and 2595 respectively, but the channel bandwidths are 90 and 100MHz. Is the overlapping CA assumed for this case?  Issue 2-2C:  Option 2.  I don’t think “the figure 6.2.1.1-1 should be modified to reflect the “not valid” and “not for block approval” aspects in workflow”, since it’s only the workflow for block approval band combinations. In new section 6.2.1.2, it’s just clarified that which band combinations are not for block approval instead of the workflow for non-block approval. |
| Qualcomm | *Issue 2-2A*:  Share the same comments as CTTL. The rule should apply for the future release as well? |
| Skyworks | *Issue 2-2A*:Yes  *Issue 2-2B*:Yes, note that further improvement in the guidelines may allow to move some of these cases to the block approval in R18 after developing the proper template  *Issue 2-2C*:Yes but we are fine if some text is used to describe the overall process. It should feasible anyhow to generate an editable diagram.  To CHTTL and Qualcomm: I can’t say if all the “not for block approval” cases will stay as is but one of our aim is to develop a specifications framework and guidelines that will allow to move some of the cases to block approval in the future.  To Huawei, we are OK to address some of the clarification in a revision. For 41C in the US the band is 194 MHz thus 190MHz CA is feasible  If the figure is not changes, it is OK for us as long as it is clearly indentified as “block approval” process and the general part has some text to define the 3 cases:  1 – not valid in a given release  2 – for block approval  3 – Not for block approval. |

* **Sub topic 2-3 Rules of higher order TPs and merging cells in CA configuration tables**

*Issue 2-3A*: Is the rule for higher order TPs which are pending approval of fallbacks acceptable?

*Issue 2-3B*: Is the rule for not merging cells in CA configuration tables acceptable?

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| **Company** | **Comments** |
| Nokia | *Issue 2-3A*: Yes  *Issue 2-3B*: Yes |
| ZTE | *Issue 2-3A*: Yes  *Issue 2-3B*: Yes |
| Samsung | *Issue 2-3A*: Yes  *Issue 2-3B*: Yes |
| Skyworks | *Issue 2-3A*: Yes  *Issue 2-3B*: Yes, but for the UL configurations it may be useful to use all the row already available (without merging) |

### CRs/TPs comments collection

*For close-to-finalize WIs and maintenance work, comments collections can be arranged for TPs and CRs. For ongoing Wis, suggest to focus on open issues discussion on 1st round.*

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| **CR/TP number** | **Comments collection** |
| R4-2204760 |  |
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| R4-2205666 |  |
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| R4-2205707 |  |
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| R4-2205708 |  |
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## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

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|  | **Status summary** |
| **Sub-topic#2-1** | *Tentative agreements:*  *In general, the template for the sheets in ‘FR1 inter-band BCS table’, ‘FR2 inter-band BCS table’, ‘FR1+FR2 inter-band BCS table’ and ‘SUL band combination BCS table’ are OK. However, the templates should also align with the approved Rel-18 basket before formal endorsement.*  *Candidate options:*  *Recommendations for 2nd round:*  *A WF to capture the agreements on future templates for Rel-18 basket is suggested to be discussed in the 2nd round. The WF for this sub topic will be merged into sub topic#3-2 for 2nd round discussion.* |
| **Sub-topic#2-2** | *Tentative agreements:*  *In general, the contents of TP are OK. But for the detail wording, the TP needs to be further refined so as to capture companies’ concern in the first round:*   * *To clarify the scope or in which release the rules are targeting to be applied for.* * *A general part is suggested to be added to define the following 3 cases*   + *Not valid in a given release*   + *For block approval*   + *Not for block approval* * *To clarify which band combinations are not for block approval instead of modifying the workflow for block approval in figure 6.2.1.1-1.* * *More exemplary combinations are suggested to be added.* * *Some editorial issues*   + *Sub-clause number 6.2.1.1.1 and 6.2.1.1.2 should be changed into 6.2.1.2.1 and 6.2.1.2.2.*   + *Hanging paragraphs in section 6.2.1.2 should be avoided.*   *Candidate options:*  *Recommendations for 2nd round:*  *To further discuss the revised TP for band combination not for block approval and guidelines on single band UL configurations using intra-band UL CA in the 2nd round.* |
| **Sub-topic#2-3** | *Tentative agreements:*  *Issue 2-3A: The TP for the rules of higher order TP(s) which are pending approval of fallback(s) is suggested to be approved.*  *Issue 2-3B: The TP for the rules of not merging cells in CA configuration tables is suggested to be approved.*  *Candidate options:*  *Recommendations for 2nd round:*  *No further discussion is needed in the 2nd round.* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provides recommendation on CRs/TPs Status update*

*Note: The tdoc decisions shall be provided in Section 3 and this table is optional in case moderators would like to provide additional information.*

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| **CR/TP number** | **CRs/TPs Status update recommendation** |
| R4-2204760 | *Noted* |
| R4-2205666 | *To be revised* |
| R4-2205707 | *Agreeable* |
| R4-2205708 | *Agreeable* |

## Discussion on 2nd round (if applicable)

*Moderator can provide summary of 2nd round here. Note that recommended decisions on tdocs should be provided in the section titled ”Recommendations for Tdocs”.*

*The 2nd round discussion mainly focuses on sub-topic #2-1 and sub-topic #2-2. For sub-topic #2-1, the WF discussion will be moved to section 3.5. In this section, we only focus on the revised TP for sub-topic #2-2.*

* ***Sub-topic #2-2 (2nd round) Rules for band combinations not for block approval***

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| **Company** | **Comments** |
|  | *Sub-topic #2-2 (2nd round)*: *(Revised R4-2205666)* |
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# Topic #3: Improving RAN4 specification structures and reducing redundant contents

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2204011 | ZTE Corporation | In RAN4#101-e meeting, a new template for delta TIB and RIB tables has been approved. In this proposal, a TP to capture the new template for delta TIB and RIB tables is proposed.  **Proposal 1: It is suggested to adopt the following TP for the new template of delta TIB and RIB tables in TR 38.862.** |
| R4-2204785 | Nokia | This contribution is a TP into TR 38.862 to introduce statistical distribution of dTib and dRib values specified in 38.101. |
| R4-2204005 | ZTE Corporation | **Observation 1: There are some limitations on using the delimiter “/” as the notation of CA or DC configurations in TR 38.862.**  **Observation 2: The redundancy for CA/DC configurations including FR2 band is more serious than the configurations having only FR1 band.**  **Observation 3: Due to the BCS issue in the configuration, the inter-band NR-DC combination is not suitable for using “/” to simplify the notation of different FR2 CA BW classes.**  **Proposal 1: For the DC configuration tables having FR2 band, the following simplification rules are suggested to be applied for EN-DC and NE-DC configurations.**  **(1) Merge different intra-band contiguous CA BW classes with field delimiter “/” for NR FR2 band in the configurations having the common FR1 part.**   * **For EN-DC configurations, only CA BW classes for the last NR FR2 band can be merged.** * **For NE-DC configurations, only CA BW classes for the first NR FR2 band can be merged.**   **(2) The first configuration with a common FR1 part should be in a separate row in EN-DC and NE-DC configuration tables.**  **Proposal 2: For searching the DC configuration with FR2 band, the following two options can be applied.**   * **(*Option a*) Use the first configuration with the common FR1 part to locate the higher order DC configurations.** For example, if we want to search DC\_n257H\_1A-3A, we can first locate DC\_n257A\_1A-3A and then find DC\_n257H\_1A-3A in the following configurations. * **(*Option b*) Use the DC configuration by removing the higher order of CA BW class to locate the higher order DC configurations.** For example, if we want to search DC\_1A\_n257G, we can use the phrase “DC\_1A\_n257” as the first step, and then we will find DC\_1A\_n257G in the following configurations. * **For searching the EN-DC configuration including FR2 band or including FR1 and FR2 band, either *Option a* or *Option b* can be used*.*** * **For searching the NE-DC configuration including FR2 band, only *Option a* can be used.**   **Observation 4: By using the delimiter “/” in the new band combination request EXCEL sheet, the extraction of supported combinations will be affected.**  **Proposal 3: Considering the consistency between the new band combination request EXCEL sheet and RAN4 specifications, it is recommended that “/” to be used for FR2 CA BW class both in EXCEL sheet and RAN4 specifications.**  **Proposal 4: We recommend using the delimiter “/” for DC combinations in Rel-18 as early as possible so as to simplify FR2 CA BW classes with a common FR1 part.** |
| R4-2204009 | ZTE Corporation | This contribution is a TP to reflect the usage of the field delimiter “/” proposed in R4-2204005 for the notation of FR2 CA BW classes in EN-DC and NE-DC configurations having the common FR1 part.  **Proposal 1: It is proposed to approve the text proposal provided in this contribution.** |

## Open issues summary

*There are four Tdocs submitted in this Topic which are related to the improving of RAN4 specification structures and reducing of redundant contents. Two papers are proposed for rule-set based delta TIB and RIB optimization approach. The other two are related to further discuss the possible improving for DC configuration table in Rel-18.*

### Sub-topic 3-1 Optimization to delta TIB and RIB

*Sub-topic description: The optimization to delta TIB and RIB has been discussed in the past RAN4 meetings for quite a few time. Some agreements on the table template and statistical analyses of CA and EN-DC delta TIB and RIB values have been achieved.*

*R4-2204011 is a TP to capture the agreements on the new template of delta TIB and RIB tables for TS 38.101. R4-2204785 is a TP* *into TR 38.862 to introduce statistical distribution of dTib and dRib values specified in TS 38.101.*

*Open issues and candidate options before e-meeting:*

**Issue 3-1A: Is the TP content in R4-2204011 for the new template of delta TIB and RIB acceptable?**

* Proposals
  + Option 1: Yes.
  + Option 2: No (Please provide some reasons).
  + Option 3: Others.
* Recommended WF
  + TBA.

**Issue 3-1B: Is the TP content in R4-2204785 for the statistical distribution of delta TIB and RIB values specified in 38.101 acceptable?**

* Proposals
  + Option 1: Yes.
  + Option 2: No (Please provide some reasons).
  + Option 3: Others.
* Recommended WF
  + TBA

### Sub-topic 3-2 Optimizations to other redundancy

*Sub-topic description: R4-2204005 is to further discuss the possible optimizations for DC configuration tables in the timeframe of Rel-18. At present, TS 38.101-3 configuration table already contains a large number of combinations including FR2. As more and more new CA BW classes are being introduced, it can be predicted that the DC combinations including FR2 will become more redundant in the future.*

*Open issues and candidate options before e-meeting:*

**Issue 3-2A: Is the following approach for further optimization to the DC configuration tables acceptable?**

For the DC configuration tables having FR2 band, the following simplification rules are suggested to be applied.

* Merge different intra-band contiguous CA BW classes with field delimiter “/” for NR FR2 band in the configurations having the common FR1 part.
  + For EN-DC configurations, only CA BW classes for the last NR FR2 band can be merged.
  + For NE-DC configurations, only CA BW classes for the first NR FR2 band can be merged.
* The first configuration with a common FR1 part should be in a separate row in EN-DC and NE-DC configuration tables.
* Proposals
  + Option 1: Yes.
  + Option 2: No (Please provide some reasons).
  + Option 3: Others.
* Recommended WF
  + TBA

**Issue 3-2B: Will the new template be adopted both in RAN4 specifications and in EXCEL file for inter-band EN-DC/NE-DC including FR2, inter-band EN-DC including FR1 and FR2 band combination request?**

* Proposals
  + Option 1: Yes.
  + Option 2: No (Please provide some reasons).
  + Option 3: Others.
* Recommended WF
  + TBA

## Companies views’ collection for 1st round

### Open issues

* **Sub topic 3-1 Optimization to delta TIB and RIB**

*Issue 3-1A*: Is the TP content in R4-2204011 for the new template of delta TIB and RIB acceptable?

*Issue 3-1B*: Is the TP content in R4-2204785 for the statistical distribution of delta TIB and RIB values specified in 38.101 acceptable?

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Nokia | *Issue 3-1A*:Yes  *Issue 3-1B*:Yes |
| ZTE | *Issue 3-1A*:Yes  *Issue 3-1B*:Yes |
| CHTTL | *Issue 3-1A*:Yes  *Issue 3-1B*:Yes |
| Apple | *Issue 3-1A*:Yes  *Issue 3-1B*:Neutral, interesting information, but why would we need such information in the TR? |
| Samsung | *Issue 3-1A*:Yes  *Issue 3-1B:*Neutral, thanks Nokia for the statics, but not sure if it has reference value when delta Tib and Rib are defined. |
| Skyworks | *Issue 3-1A*:Yes  *Issue 3-1B*:Neutral, it could have used different frequency ranges in some areas. We are not suggesting a change however as the info is already useful |

* **Sub topic 3-2 Optimizations to other redundancy**

*Issue 3-2A*: Is the following approach for further optimization to the DC configuration tables acceptable?

*Issue 3-2B*: Will the new template be adopted both in RAN4 specifications and in EXCEL file for inter-band EN-DC/NE-DC including FR2, inter-band EN-DC including FR1 and FR2 band combination request?

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| --- | --- |
| **Company** | **Comments** |
| Nokia | *Issue 3-2A: Yes*  *Issue 3-2B: Yes* |
| ZTE | *Issue 3-2A: Yes*  *Issue 3-2B: Yes* |
| Apple | Issue 3-2A: No  Introducing “/” to combine multiple combinations into one entry will corrupt the tables, so that it will not be possible to automatically search for supported combinations. What is described as a solution to manual search doesn’t really work, if you want to detect in an automated way, if a combination is supported in the spec. For this it is needed to have each combination listed separately in the specification, so that an automated search and detection is possible.  This issue is even noted in option 4 of the paper:  **Observation 4: By using the delimiter “/” in the new band combination request EXCEL sheet, the extraction of supported combinations will be affected.**  Especially critical is when this is combined with the notes as presented in this paper: How can you automatically detect that DC\_1A\_n77(2A)-n257D2/G2/H2/I2 is including DC\_1A\_n77(2A)-n257H?  This example shows that also having the notes within the band combination notation is really an issue, as it disturbes the notation completely.  The next issue is that such a notation needs to be consistent for all classes of combinations. Especially when looking at those combinations that take up most of the space in the tables: combined contiguous and non-contiguous combinations like DC\_2A\_13A\_n261(2A-G), DC\_2A\_13A\_n261(2A-H), …  Would these become DC\_2A\_13A\_n261(2A)/(3A)/(4A)/(2G)/(2H)/(A-G)/(A-H)/(A-I)/(A-J)/(A-K)/(A-2G)/(A-G-H)/(A-G-I)/(2A-G)/(2A-H)/(2A-I)/… ? This would be crazy to read, nobody understands this and also searching or extracting such a combination would not be possible with a reasonable effort  This is not at all a simplification, it is making band combinations lists very complicated instead, the only advantage is that the tables may be slightly shorter, but nobody can read or use them anymore, not as a human, nor as a machine.  Also it would make the whole notation inconsistent, when we only can use it for a small number of combinations, but not generally for all combinations.  The conclusion is that this change is not desirable as it will result in very big issues when using the resulting tables in development as well as in 3GPP.  Issue 3-2B: No. Please see explanation above. |
| Huawei | Issue 3-2A:  Option 2.  We are drafting the standard. We can’t violate the standard of notation principle just for simplification. This is a R17 SI, so I don’t understand how we can conclude or specify something for R18. In TR 38.862, it’s clearly stated that some incorrect examples include DC\_1A-2A\_n260A/G/H/I/J/K/L/M, but right now we try to specify these incorrect examples.  We agree with Apple’s observations.  Issue 3-2B:  Option 2. |
| ZTE2 | Reply to Apple and Huawei:  We agree that by introducing “/” to combine multiple combinations, the ability of extraction of supported combinations will be affected just as we proposed in Observation 4. However, considering that more and more new CA BW classes are being introduced, the configuration table size for inter-band CA/DC especially for the configurations having FR2 bands grows explosively. It is really a big issue to be solved in future releases. We believe our solution is a tradeoff between the complexity and trackability of the configuration table.  Regarding to the issue of “note in configuration”, we think this is not a conflict with our Proposal 2. In our Proposal 2, we suggest two options for searching a certain combination. Considering that “note” only appears in the end of each combination, it will not disturb the notation. Just as the example in the comment, for DC\_1A\_n77(2A)-n257D2/G2/H2/I2 , if we want to search DC\_1A\_n77(2A)-n257H, the expression DC\_1A\_n77(2A)-n257 could be used according to Proposal 2.  Regarding to the issue of “combined contiguous and non-contiguous combinations”, if DC\_2A\_13A\_n261(2A)/(3A)/(4A)/(2G)/(2H)/(A-G)/(A-H)/(A-I)/(A-J)/(A-K)/(A-2G)/(A-G-H)/(A-G-I)/(2A-G)/(2A-H)/(2A-I)/… looks too long to read, how about if we split it into several parts in several rows? For example,  DC\_2A\_13A\_n261(2A)/(3A)/(4A)/(2G)/(2H)  DC\_2A\_13A\_n261(A-G)/(A-H)/(A-I)/(A-J)/(A-K)/(A-2G)  DC\_2A\_13A\_n261(A-G-H)/(A-G-I)/(2A-G)/(2A-H)/(2A-I)/…  Furthermore, we think in this case, currently repeated rows for so many combined contiguous and non-contiguous combinations in the table are also not good for readability.  Regarding to the issue of “notation principle”, we don’t think the optimization is a violation to the principle. It is true this is a Rel-17 SI, however the recommendation for future optimization should not be excluded. |
| Samsung | *Issue 3-2A: Yes*  *Issue 3-2B: Yes*  *Samsung are planning to help our operator customer propose more than 200 FR1+FR2 CA and DC combos in May meeting or in Rel-18. I do see the necessity of this simplification, not matter from the spec simplification perspective or reducing the work of TP/CR proponent perspective, it is helpful.* |
| Skyworks | We support further optimization but “/” is probably not a good delimitator to use. May be we need to think along the lines to only list the highest order case and have the lower fallbacks as implicit. Not sure we can agree on this in R17. |

### CRs/TPs comments collection

*For close-to-finalize WIs and maintenance work, comments collections can be arranged for TPs and CRs. For ongoing Wis, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2204011 |  |
|  |
|  |
| R4-2204785 |  |
|  |
|  |
| R4-2204009 | Apple: This TP is not acceptable, as the result would be an inconsistent and complicated notation, not a simplification. |
|  |
|  |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic#3-1** | *Tentative agreements:*  (*Issue 3-1A*) *The TP for the template of delta TIB and RIB is suggested to be approved.*  (*Issue 3-1B*) *The TP for the statistical distribution of delta TIB and RIB values is suggested to be approved.*  *Candidate options:*  *Recommendations for 2nd round:*  *No further discussion is needed in the 2nd round.* |
| **Sub-topic#3-2** | *Tentative agreements:*  *The requirements to optimize the inter-band DC configurations having FR2 bands are recognized. However no consensus has been reached on whether use delimiter “/” or not. Further discussion on other possible optimizations are suggested.*  *Candidate options:*  *Recommendations for 2nd round:*  *Further discussion on possible optimizations for the inter-band DC configurations having FR2 bands and A WF (to be merged together with the WF in sub-topic #2-1) is to collect the concerns or agreements.* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provided recommendation on CRs/TPs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| R4-2204011 | *Agreeable* |
| R4-2204785 | *Agreeable* |
| R4-2204009 | *To be discussed in 2nd round* |

## Discussion on 2nd round (if applicable)

*Moderator can provide summary of 2nd round here. Note that recommended decisions on tdocs should be provided in the section titled ”Recommendations for Tdocs”.*

*The 2nd round discussion mainly focuses on sub-topic #3-2, which is to further discuss the possible optimizations for the inter-band DC configurations having FR2 bands. A WF will be used to collect the related agreements or companies’ concern. The discussion for sub-topic #2-1 to update the template for NR CA and SUL band combinations will also be included in the WF.*

* ***Sub-topic #2-1 (2nd round) Update the template for NR CA and SUL band combinations***
* ***Sub-topic #3-2 (2nd round) Optimizations to other redundancy***

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| --- | --- |
| **Company** | **Comments** |
|  | *Sub-topic #2-1 & #3-2 (2nd round)*: *(WF on further simplification for band combinations)* |
|  |  |
|  |  |

# Recommendations for Tdocs

## 1st round

**New tdocs**

|  |  |  |
| --- | --- | --- |
| **Title** | **Source** | **Comments** |
| *WF on further simplification for band combinations* | *ZTE Corporation* |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2203987 | TR 38.862 V060 Band combination handling | ZTE Corporation | *For email approval* |  |
| R4-2204005 | Further discussion on simplification for DC configuration table in Rel-18 | ZTE Corporation | *Noted* |  |
| R4-2204009 | TP to TR 38.862 on simplification for EN-DC and NE-DC configuration tables | ZTE Corporation | *To be discussed in 2nd round* |  |
| R4-2204010 | TP to TR 38.862 on symbols and abbreviations | ZTE Corporation | *Agreeable* |  |
| R4-2204011 | TP to TR 38.862 on template of delta TIB and RIB tables | ZTE Corporation | *Agreeable* |  |
| R4-2204760 | Update template for Rel-18 NR CA and SUL band combinations | ZTE Corporation | *Noted* |  |
| R4-2204785 | TP to TR 38.862: Statistics of dTib and dRib | Nokia, Nokia Shanghai Bell | *Agreeable* |  |
| R4-2205666 | TP to TR38.862 on BC not for block approval and guidelines on single band UL configurations using intra-band UL CA | Skyworks Solutions Inc. | *Revised* |  |
| R4-2205707 | TP to 38.862 on that higher order TP(s) are pending approval of fallback(s) | Ericsson | *Agreeable* |  |
| R4-2205708 | TP to 38.862 on rule about not merging cells in CA configuration tables | Ericsson | *Agreeable* |  |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics incl. existing and new tdocs.
2. For the Recommendation column please include one of the following:
   1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
   2. Other documents: Agreeable, Revised, Noted
3. For new LS documents, please include information on To/Cc WGs in the comments column
4. Do not include hyper-links in the documents

## 2nd round

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-210xxxx | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-210xxxx | WF on … | YYY | Agreeable, Revised, Noted |  |
| R4-210xxxx | LS on … | ZZZ | Agreeable, Revised, Noted |  |
|  |  |  |  |  |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics.
2. For the Recommendation column please include one of the following:
   1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
   2. Other documents: Agreeable, Revised, Noted
3. Do not include hyper-links in the documents

# Annex

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|  |  |  |
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Note:

1. Please add your contact information in above table once you make comments on this email thread.
2. If multiple delegates from the same company make comments on single email thread, please add you name as suffix after company name when make comments i.e. Company A (XX, XX)