**3GPP TSG-RAN WG4 Meeting # 98-bis-e Rev. of R4-2105217**

**Electronic Meeting, 12th – 20th April, 2021**

**Agenda item:** 9.6

**Source:** Moderator (ZTE)

**Title:** Email discussion summary for [98-bis-e][144] FS\_BC\_handling

**Document for:** Information

# Introduction

*In this email discussion we will handle following contributions submitted in AI 9.6: Study on band combination handling in RAN4.*

*Following four topics are discussed in this summary:*

* *Topic #1: General and TR*
  + *R4-2104865, R4-2104874, R4-2106683*
* *Topic #2: How to introduce band combinations including TP format*
  + *R4-2107045*
* *Topic #3: Rules and guidelines of specifying band combinations including notations of CA/DC combinations*
  + *R4-2104892*
* *Topic #4: Improving RAN4 specification structures and reducing redundant contents*
  + *R4-2104864, R4-2104875, R4-2104876, R4-2104877*

*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] | [**R4-2104864**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2104864.zip) | Further considerations on delta TIB and RIB simplification for band combinations | ZTE Corporation |
| [2] | [**R4-2104865**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2104865.zip) | On band combination handling | ZTE Corporation |
| [3] | [**R4-2104874**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2104874.zip) | TR skeleton 38.xxx v001 Band combination handling | ZTE Corporation |
| [4] | [**R4-2104875**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2104875.zip) | draft CR to TS 38.101-1 on optimization to channel bandwidth per operating band (Rel-16) | ZTE Corporation |
| [5] | [**R4-2104876**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2104876.zip) | draft CR to TS 38.101-2 on optimization to channel bandwidth per operating band (Rel-16) | ZTE Corporation |
| [6] | [**R4-2104877**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2104877.zip) | draft CR to TS 38.104 on optimization to BS channel bandwidths and SCS per operating band (Rel-16) | ZTE Corporation |
| [7] | [**R4-2104892**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2104892.zip) | TP on rules and guidelines for specifying band combinations | Apple |
| [8] | [**R4-2106683**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2106683.zip) | Discussion on Band combination handling | Huawei, HiSilicon |
| [9] | [**R4-2107045**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2107045.zip) | Discussion on guidelines for handling SDL related EN-DC combinations | CHTTL |

# Topic #1: General and TR

## Companies’ contributions summary

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| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2104865 | ZTE Corporation | **Proposal 1:** It is recommended to introduce the following aspects in the TR with the timetable as follows.   * + To capture the rules and guidance of current template for Rel-17 basket WIs in the first stage.     - If a new template is adopted in the future discussion, it should be then captured in the TR accordingly.   + To collect agreements on the rules of specifying band combinations in the first stage.     - If there is any other new rules agreed in the future, it should be introduced later in the TR.   + To collect the agreed optimization rules for band combinations in the first stage.     - If any changes to the existing rules having impacts on the basket WID, apply all the new changes in batch to RAN4 specifications in the meeting just before the end of Rel-17. |
| R4-2104874 | ZTE Corporation | TR skeleton 38.xxx v001 Band combination handling |
| R4-2106683 | Huawei, HiSilicon | **Observation 1:** There is no need to further update the template of request sheets except for updating coversheet for new basket WIs in Rel-17.  **Observation 2:** The earlier the general issues are identified, the better companies can move forward the process for specific band combinations.  **Proposal 1:** It’s proposed to capture current approved template of band combination request sheets for Rel-17 basket WI into the TR.  **Proposal 2:** It’s better to capture all the agreements into an official document, which is related to the procedure on the introduction of band combinations.  **Proposal 3:** Rapporteurs, contact persons and delegates are encouraged to identify the general issues as early as possible to avoid inefficient discussion when band combinations are requested. |

## Open issues summary

### Sub-topic 1-1 TR Skeleton

*Sub-topic description: This sub-topic is to discuss the skeleton of the TR.*

**Issue 1-1A: Is the structure of TR skeleton reasonable?**

* Proposals
  + Option 1: Yes
  + Option 2: No

### Sub-topic 1-2 Template of band combination request sheet

*Sub-topic description: This sub-topic is to discuss if the template of band combination request sheet needs further update.*

**Issue 1-2A: Does it need to capture the current approved template of band combination request sheet in TR?**

* Proposals
  + Option 1: Yes
  + Option 2: No

**Issue 1-2B: Does the template of band combination request sheet need further update?**

* Proposals
  + Option 1: Yes
  + Option 2: No
  + Option 3: Depend on needs.

### Sub-topic 1-3 Timeline of capturing the rules

*Sub-topic description: This sub-topic is to discuss the timeline of capturing the rules of specifying band combination, optimization of band combination and template for basket WI if needed.*

**Issue 1-3A: To capture the agreed rules of specifying band combination, optimization of band combination and template for basket WI in TR in the first stage. New optimization is not excluded.**

* Proposals
  + Option 1: Yes
  + Option 2: No

**Issue 1-3B: For newly introduced rules of band combination, when to apply the changes to RAN4 specifications?**

* Proposals
  + Option 1: Apply the changes as soon as the new rules are approved.
  + Option 2: If no impacts on the basket WID, apply the changes when the rules are approved. Otherwise, apply the changes in batch to RAN4 specifications in the meeting just before the end of Rel-17.
  + Option 3: Other.

**Issue 1-3C: Guidelines for CA/DC combinations Block/Approval?**

* Open discussion
  + Question 1: To refine the scope of “Combinations Not for Block Approval” in RP-210892.
  + Question 2:Rapporteurs, contact persons and delegates identify the general issues as early as possible when band combinations are requested.
  + Question 3: Other.

## Companies views’ collection for 1st round

### Open issues

* **Sub topic 1-1 TR Skeleton**

Issue 1-1A: Is the structure of TR skeleton reasonable?

|  |  |
| --- | --- |
| **Company** | **Comments** |
| ZTE | Option 1. |
| CHTTL | I am really really sorry about this… but my computer said it is dangerous to open R4-2104874, the TR skeleton… and blocked it. Is there anyone having the same issue? |
| ZTE2 | To CHTTL. Regarding to the issue mentioned, I suggest to unzip the file before open it instead of open the zip file directly. Sometimes it works. Anyway, considering the structure of TP in R4-2104892 proposed by Apple, I have revised the TR structure in the folder “\Inbox\Drafts\[98bis-e][144] FS\_BC\_Handling\Round1” and link as below. Further modification will be possible based on discussion.  <https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_98bis_e/Inbox/Drafts/%5B98bis-e%5D%5B144%5D%20FS_BC_Handling/Round%201/R4-2104874-r1%20%20%20%20%20TR%20skeleton%2038.XXX%20V001%20Band%20combination%20handling.docx> |
| Nokia | Is there a place holder where to collect guidelines on what needs to be studied. Current TR templates do not do that instead of agreements have been lost in various TDocs. As on example receiver harmonic mixing for which TRs do not give any guidance on how many orders of harmonics need to be evaluated. There are many other examples. |

* **Sub topic 1-2 Template of band combination request sheet**

Issue 1-2A: Does it need to capture the current approved template of band combination request sheet in TR?

Issue 1-2B: Does the template of band combination request sheet need further update?

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| --- | --- |
| **Company** | **Comments** |
| ZTE | Issue 1-2A: Option 1.  Issue 1-2B: Option 3. Although the current template is relatively stable, we cannot ensure that no updates will be introduced in the future. There may be room for further improvement. For example, the application for band combination is very complicated right now, is there any possibility of introducing some kind of automatic tools to check the validity of data filled in the template? |
| Huawei | Issue 1-2A: Option 1.  Issue 1-2B: If RAN4 agree some updates, it can be applied to Rel-18 instead of Rel-17. We need to consider the version control for the template. |
| CHTTL | Issue 1-2A: The template is an excel sheet, maybe it can be attached in the zip file of TR?  Issue 1-2B: for Rel.17 maybe it is no need to update. (As more and more different kinds of baskets are rising, maybe some update can applied for Rel.18 if necessary) |
| Nokia | templates/requests could be placed to ftp and TR could have a link there, Then when templates are updated TR do not need an update. |

* **Sub topic 1-3 Timeline of capturing the rules**

Issue 1-3A: To capture the agreed rules of specifying band combination, optimization of band combination and template for basket WI in TR in the first stage. New optimization is not excluded.

Issue 1-3B: For newly introduced rules of band combination, when to apply the changes to RAN4 specifications?

Issue 1-3C: Guidelines for CA/DC combinations Block/Approval?

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| --- | --- |
| **Company** | **Comments** |
| ZTE | Issue 1-3A: Option 1.  Issue 1-3B: Option 2. Considering the need to keep the basket WID work stable without confusing the rapporteur, it is helpful to apply the new rules to RAN4 specs in a batch just before the end of Rel-17. However, the agreed optimization rules in each meeting can be captured in the TR.  Issue 1-3C: To improve the efficiency of Block/Approval, the guideline for CA/DC combination approval should be captured in the TR. For the new band combination requests which are in the scope of “Combinations Not for Block Approval” in RP-210892, the requests should not be started before the general issues are identified and studied. A dedicated AI should be set under the basket WI agenda. |
| Huawei | Issue 1-3A: Option 1.  Issue 1-3B: Option 3. RAN4 need to consider the version control for the template.  Issue 1-3C: Option 2 |
| CHTTL | Issue 1-3C: it seems like this issue is discussed in thread 106. |
| ZZZ |  |

### 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** |
| XXX | Company A |
| Company B |
|  |
| YYY | Company A |
| Company B |
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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** | **Issue 1-1A: Is the structure of TR skeleton reasonable?**   * Proposals   + Option 1: Yes     - ZTE   + Option 2: No   + Others     - Nokia: Has concerns on a place holder in the TR to collect guidelines on what needs to be studied.   ***Tentative agreements:*** *The overall structure of TR skeleton is reasonable, but a place holder in the TR to collect guidelines on what needs to be studied should be considered.*  ***Candidate options:***  ***Recommendations for 2nd round:*** *Further discuss on what should be added as a place holder in the TR skeleton.* |
| **Sub-topic #1-2** | **Issue 1-2A: Does it need to capture the current approved template of band combination request sheet in TR?**   * Proposals   + Option 1: Yes     - ZTE, Huawei, CHTTL, Nokia   + Option 2: No   **Issue 1-2B: Does the template of band combination request sheet need further update?**   * Proposals   + Option 1: Yes   + Option 2: No   + Option 3: Depend on needs.     - ZTE, Huawei (for Rel-18), CHTTL (for Rel-18)   *Several companies raised concerns on how to capture the band combination request template in TR. Two options are provided during discussion. One is to attach the template in the zip file of TR. The other is to place the template on ftp server and TR references through a hyperlink.*  *Tentative agreements: Agree to capture the template of band combination request sheet in the TR. It can be further updated in Rel-18 if needed. The way how to capture the template will be further discussed in the 2nd round.*  *Candidate options: How to capture the template in the TR?*   1. *Option 1: Attached in the zip file of TR.* 2. *Option 2: Use a hyperlink to the FTP server.* 3. *Option 3: Others.*   *Recommendations for 2nd round: To further discuss how to capture the template in the TR. The following options are to be considered.*   1. *Option 1: Attached in the zip file of TR.* 2. *Option 2: Use a hyperlink to the FTP server.* 3. *Option 3: Others.* |
| **Sub-topic #1-3** | **Issue 1-3A: To capture the agreed rules of specifying band combination, optimization of band combination and template for basket WI in TR in the first stage. New optimization is not excluded.**   * Proposals   + Option 1: Yes     - ZTE, Huawei   + Option 2: No   **Issue 1-3B: For newly introduced rules of band combination, when to apply the changes to RAN4 specifications?**   * Proposals   + Option 1: Apply the changes as soon as the new rules are approved.   + Option 2: If no impacts on the basket WID, apply the changes when the rules are approved. Otherwise, apply the changes in batch to RAN4 specifications in the meeting just before the end of Rel-17.     - ZTE   + Option 3: Other.     - Huawei: RAN4 need to consider the version control for the template.   **Issue 1-3C: Guidelines for CA/DC combinations Block/Approval?**   * Open discussion   + Question 1: To refine the scope of “Combinations Not for Block Approval” in RP-210892.   + Question 2:Rapporteurs, contact persons and delegates identify the general issues as early as possible when band combinations are requested.   + Question 3: Other.   *Several companies discuss issue 1-3C. ZTE thinks for the new band combination requests which are in the scope of “Combinations Not for Block Approval” in RP-210892, the requests should not be started before the general issues are identified and studied. A dedicated AI should be set under the basket WI agenda. Huawei suggests that Rapporteurs, contact persons and delegates identify the general issues as early as possible when band combinations are requested. CHTTL mentioned that the topic is discussed in the thread #106.*  *Tentative agreements: It is agreeable to capture the agreed rules of specifying band combination, optimization of band combination and template for basket WI in TR in the first stage.*  *Candidate options:*  *Recommendations for 2nd round: No further discussion in 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.*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

* **Sub topic 1-1 TR Skeleton**

*Further discussion on what should be added as a place holder in the TR skeleton?*

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| **Company** | **Comments** |
| ZTE | We have uploaded the revised TR skeleton as below. Further comments are welcome.  https://www.3gpp.org/ftp/tsg\_ran/WG4\_Radio/TSGR4\_98bis\_e/Inbox/Drafts/%5B98bis-e%5D%5B144%5D%20FS\_BC\_Handling/Round%202/R4-2104874-r2%20%20%20%20%20TR%20skeleton%2038.XXX%20V001%20Band%20combination%20handling.docx |
| Nokia | We still do not see a placeholder on issues what needs to be studied for particular band combination type. Is the intention to capture that information elsewhere, Now TR is about how to name a configuration, a process how to get TP agree and how to simplify TS. But apart from missing section TR skeleton looks good. Can you add a Clause 7 (current 7 🡪8) **Guidelines for technical studies for band combinations.** We can do sub-clauses in next meeting. |
| ZZZ |  |

* **Sub topic 1-2 Template of band combination request sheet**

*To further discuss how to capture the template in the TR. The following options are to be considered.*

1. *Option 1: Attached in the zip file of TR.*
2. *Option 2: Use a hyperlink to the FTP server.*
3. *Option 3: Others.*

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| **Company** | **Comments** |
| ZTE | Both option 1 and option 2 are ok. For option 1, if we update the template, the TR should also be updated accordingly. For option 2, we should decide in which folder on ftp server the template to place. We slightly prefer option 2. |
| Nokia | Option 2 |
| Huawei | Both Option 1 and Option 2 are OK. Maybe rapporteur can check both option1 and option2 with MCC if there is something missing.  For option 1, if we need to update this TR for different Release, we can go option 1 using the version control.  If we go Option 2, it’s recommended to include the web address or hyperlink of the ftp server into the TR. It’s convenient to download the template for readers. |
| ZZZ |  |

# Topic #2: How to introduce band combinations including TP format

## Companies’ contributions summary

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| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2107045 | CHTTL | **Proposal 1:** RAN4 to discuss the general guidelines for handling SDL related EN-DC combinations, including the following questions:   1. Which basket WI is the place to analyze the Rx impact of the two bands EN-DC combinations with one SDL band? 2. Do the two bands EN-DC combinations with one SDL band need to be requested to the basket individually? 3. Do two bands EN-DC combinations with one SDL band need to be listed as a configuration in 38.101-3? |

## Open issues summary

### Sub-topic 2-1 Handling of SDL related EN-DC combinations

*Sub-topic description: This sub-topic is to discuss the guidelines for handling SDL related EN-DC combinations.*

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

**Issue 2-1A: Which basket WI is the place to analyze the Rx impact of the two bands EN-DC combinations with one SDL band?**

* Proposals
  + Option 1: 1 LTE band and 1 NR band basket.
  + Option 2: Based on the higher order combos, 2 LTE band and 1 NR band or 1 LTE band and 2 NR band
  + Option 3: Other

**Issue 2-1B: Do the two bands EN-DC combinations with one SDL band need to be requested to the basket individually?**

* Proposals
  + Option 1: Yes.
  + Option 2: No.

**Issue 2-1C: Do two bands EN-DC combinations with one SDL band need to be listed as a configuration in 38.101-3?**

* Proposals
  + Option 1: Yes with a note mentioning that this configuration cannot be used alone as there is no UL on the SDL band.
  + Option 2: No need.

## Companies views’ collection for 1st round

### Open issues

* **Sub topic 2-1 Handling of SDL related EN-DC combinations**

Issue 2-1A: Which basket WI is the place to analyze the Rx impact of the two bands EN-DC combinations with one SDL band?

Issue 2-1B: Do the two bands EN-DC combinations with one SDL band need to be requested to the basket individually?

Issue 2-1C: Do two bands EN-DC combinations with one SDL band need to be listed as a configuration in 38.101-3?

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| --- | --- |
| **Company** | **Comments** |
| ZTE | Issue 2-1A: Option 1.  Issue 2-1B: Option 1.  Issue 2-1C: Option 1. |
| Huawei | Issue 2-1A: Option 2.  Thanks for rising this issues.  One alternative is to analysis the corresponding requriements under the WI (2 LTE bands + 1 NR band or 1 LTE band + 2 NR bands), since there is no fallback reuqirements can be referred.  Issue 2-1B: Option 2. I’m not sure whether one SDL LTE band + one NR band is a valid band combination. If we go option 1, the redundant work has to be done in RAN4.  Issue 2-1C: Option 2. We just list the valid band combinations. |
| CHTTL | Issue 2-1A: Option 1.  Issue 2-1B: Option 1.  Issue 2-1C: Option 1.  In general we are ok, but we slightly prefer option 1 as above, since there is one drawback on option 2, since there might be plenty of higher order combos, given Y is an SDL band, there might be DC\_A-Y\_nX, DC\_B-Y\_nX, DC\_C-Y\_nX… and so on, it might be difficult to trace whether and where the DC\_Y\_nX is analyzed. |
| ZZZ |  |

### CRs/TPs comments collection

*Major close to finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| XXX | Company A |
| Company B |
|  |
| YYY | Company A |
| Company B |
|  |

## 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** | **Issue 2-1A: Which basket WI is the place to analyze the Rx impact of the two bands EN-DC combinations with one SDL band?**   * Proposals   + Option 1: 1 LTE band and 1 NR band basket.     - ZTE, CHTTL   + Option 2: Based on the higher order combos, 2 LTE band and 1 NR band or 1 LTE band and 2 NR band     - Huawei   + Option 3: Other   **Issue 2-1B: Do the two bands EN-DC combinations with one SDL band need to be requested to the basket individually?**   * Proposals   + Option 1: Yes.     - ZTE, CHTTL   + Option 2: No.     - Huawei   **Issue 2-1C: Do two bands EN-DC combinations with one SDL band need to be listed as a configuration in 38.101-3?**   * Proposals   + Option 1: Yes with a note mentioning that this configuration cannot be used alone as there is no UL on the SDL band.     - ZTE, CHTTL   + Option 2: No need.     - Huawei   *There are different views on alternatives to Handling of SDL related EN-DC combinations. A WF is suggested to catch some agreements on this issue.*  *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round: A WF is suggested in 2nd round to further discuss possible alternatives to handle the SDL related EN-DC combinations.* |

### CRs/TPs

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

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| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## 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”.*

* **Sub topic 2-1 Handling of SDL related EN-DC combinations**

*WF on Handling of SDL related EN-DC combinations. More comments and constructive suggestions on the sub-topic are encouraged in the 2nd round discussion.*

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| --- | --- |
| **Company** | **Comments** |
| XXX |  |
| YYY |  |
| ZZZ |  |

# Topic #3: Rules and guidelines of specifying band combinations including notations of CA/DC combinations

## Companies’ contributions summary

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| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2104892 | Apple | **Proposal 1:** It is proposed to approve the text proposal provided in this contribution. |

## Open issues summary

### Sub-topic 3-1 CA/DC band configurations TP

*Sub-topic description: This sub-topic is to discuss the rules on request sheet and notations for CA/DC configurations as a text proposal in the TR.*

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

**Issue 3-1A: Is the content of the TP acceptable?**

* Proposals
  + Option 1: Yes.
  + Option 2: No.

## Companies views’ collection for 1st round

### Open issues

* **Sub topic 3-1 CA/DC band configurations TP**

Issue 3-1A: Is the content of the TP acceptable?

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| --- | --- |
| **Company** | **Comments** |
| ZTE | One general question. In the TP, some guidelines are related to LTE configurations. We are not sure if LTE related guidelines should also be included in the TR. We have no strong opinion on this but would like to hear other companies’ view. Some other comments are as below.  (1) In sub-clause X.1, the notation of DC combination is described as two list (first LTE, then NR) of bands with bandwidths. However, the notation is not suitable for NE-DC configuration. The cases for NE-DC should also be included.  (2) In sub-clause X.2.2.1, the sentence “Non-contiguous CA combinations are just listing multiple single carriers separated by “-” is inaccurate. The example configuration “CA\_4A-4E” just following the sentence does not meet the above definition.  (3) For sub-clause X.4.2, it is related to “request sheet”. Since we are discussing if there is a specific clause for “Band combination request”, we suggest to move the related content to the “Band combination request” specific clause.  (4) Can we move sub-clause X.4.1 to X.3? It seems they are all related to the usage of band combination notation.  (5) A typo in X.3. In the first bullet, “V2X\_ should be “V2X\_”. The right quotation mark is missing. |
| DISH Network | Reading the good TP, I started to think NR DC Notation should perhaps be further discussed. There are already NR DC cases for FR1-FR1 with Intra-band CA within one/both connectivities, e.g DC\_n48(2A)-n66A. In this case it is somewhat obvious that one connectivity is “n48(2A)” and other is “n66A”. However, nothing precludes to assume that connectivities were “n48A” and “n48A-n66A”. In future, there will also probably be some cases with 3 bands like in LTE. Lets use DC\_n48A-n66A-n71A as an example.  If there is no way to distinguish between different connectivity options i.e all options are supported by default, then on actions are necessary. However, if there is a need to distinguish, should we consider using “\_” in between connectivities? For instance DC\_n48(2A)\_n66A identifies clearly that “n48(2A)” is one and “n66A” is another one. For 3 band cases the need to distinguish might be higher, I believe. |
| Huawei | To DISH, it seems that we discussed this issue in previous meeting. In RAN4, my understanding is not to distinguish cases. If DC\_n48A-n66A-n71A was introduced into the spec, it means that all the possibilities can be supported in RAN4’s spec, such as DC\_n48A\_n66A-n71A, DC\_n48A-n66A\_n71A, DC\_n48A-n71A \_n66A…. If possible, we can introduce some texts to clarify it in general. |
| Qualcomm | The rules and guideline captured in the TP should apply for both NR and LTE.  We echo DISH’s comments. For the banc combo such as DC\_n48(2A)-n66A, we should clarify if all the possible fallback combinations including DC\_n48A-n66A have to be supported by UE or not. What’s the rule for the current band combo request? It should be clarified and captured in the TR. |
| Nokia | To ZTE we think that having LTE guidelines in this TR is justified. We support the TP but seems that there are some modifications needed based on other comments. |
| NTT DOCOMO | We also would like to clarify the same point that DISH pointed out, and if it is common understanding that Huawei mentioned above, we would like to capture it in the TR. |
| Apple | Many thanks to all the companies for commenting on the TP. We would like to try to respond to some of the good points raised by the commenting companies below.  To ZTE: it is true that pure LTE configurations might be beyond the scope of the SI, although it might be helpful to capture the LTE example just for clarity. Perhaps such an informational comment can be added to the TP in a further revision. We also agree to add an example of an NE-DC configuration. The sentence in X.2.2.1 “In sub-clause X.2.2.1, the sentence “Non-contiguous CA combinations are just listing multiple single carriers separated by “-”” can be corrected to say “listing multiple sub-blocks separated by “-“”. Regarding the comment to X.4.2, we are fine to shift this to a different clause based on the decision related to the TR skeleton. Similarly regarding X.4.1: it is fine to move this content to X.3. Also, thank you for catching the typo in the V2X example in X.3.  Regarding the NR-DC notation, we are fine to check the fallback rule from band combination requests and to document the outcome. |

### CRs/TPs comments collection

*Major close to finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2104892 | ZTE: see the comments above. |
| Company B |
|  |

## 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** | * **Sub topic 3-1 CA/DC band configurations TP**   **Issue 3-1A: Is the content of the TP acceptable?**   * Proposals   + Option 1: Yes.   + Option 2: No.   *Regarding to the TP, some questions have been raised. For example, whether LTE related combinations should be included or not. And for NR-DC notation, whether different connectivities should be distinguished or not.*  *Tentative agreements: To be revised.*  *Candidate options:*  *Recommendations for 2nd round: To capture companies’ comments in 1st round and further check in 2nd round.* |

### 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** |
| R4-2104892 | *To be revised* |

## 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”.*

* **Sub topic 3-1 CA/DC band configurations TP**

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| Revised  R4-2104892 | Company A: |
| Company B: |
| Company C: |

# Topic #4: Improving RAN4 specification structures and reducing redundant contents

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2104864 | ZTE | **Observation 1:** The total row reduced ratio for ΔTIB,c and ΔRIB,c tables by using solution “*Option 2*” is higher than using solution “*Option 1*”.  **Observation 2:**  Since “*Option 2*” has a fixed interval for each configuration with only one row in the table, the readability of “*Option 2*” will be better than “*Option 1*” to some extent.  **Observation 3:**  “*Option 3*” uses the format “Band(s) / ΔTIB,c” or “Band(s) / ΔRIB,c” to arrange in columns, and merges different frequency bands having the same ΔTIB,c or ΔRIB,c values. Its simplicity and readability are better than those of “*Option 1*” and “*Option 2*”.    **Proposal 1:** The template in “*Option 3*” is suggested for ΔTIB,c and ΔRIB,c tables for CA/DC configurations due to the better simplicity and readability.  **Proposal 2:**  It is recommended to collect the agreements into the newly approved TR for “band combination handling” for now and apply the new template for ΔTIB,c and ΔRIB,c in “Option 3” before the end of Rel-17. |
| R4-2104875 | ZTE | To replace NR band supporting channel bandwidth “Yes” with the UE channel bandwidth value in Table 5.3.5-1. |
| R4-2104876 | ZTE | To replace NR band supporting channel bandwidth “Yes” with the UE channel bandwidth value in Table 5.3.5-1. |
| R4-2104877 | ZTE | To replace NR band supporting *BS channel bandwidth* “Yes” with the *BS channel bandwidth* value in table 5.3.5-1 and table 5.3.5-2.  To remove the cell boarder line of column “NR Band” in table 5.3.5-1 and table 5.3.5-2 |

## Open issues summary

### Sub-topic 4-1 Optimization to channel bandwidths for each NR band

*Sub-topic description: This sub-topic is to discuss the optimization to channel bandwidths for each NR band.*

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

**Issue 4-1A: Is the optimization to the table of *UE channel bandwidth* per *operating band* acceptable? (****R4-2104875 / R4-2104876)**

* Proposals
  + Option 1: Yes.
  + Option 2: No.

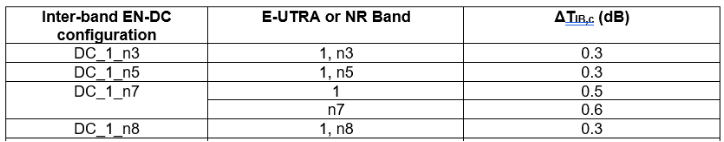
**Issue 4-1B: Is the optimization to the table of *BS channel bandwidth* per *operating band* acceptable? (R4-2104877)**

* Proposals
  + Option 1: Yes.
  + Option 2: No.

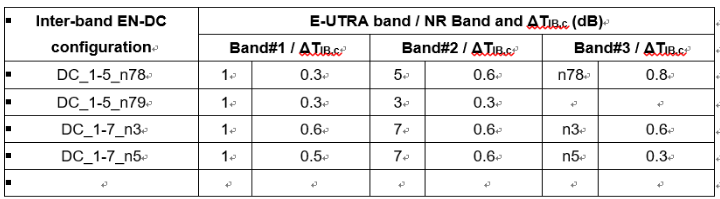
### Sub-topic 4-2 Optimization to the tables of ΔTIB,c and ΔRIB,c

**Issue 4-2A: Which optimization to the tables of ΔTIB,c and ΔRIB,c is *acceptable (R4-2104864)?***

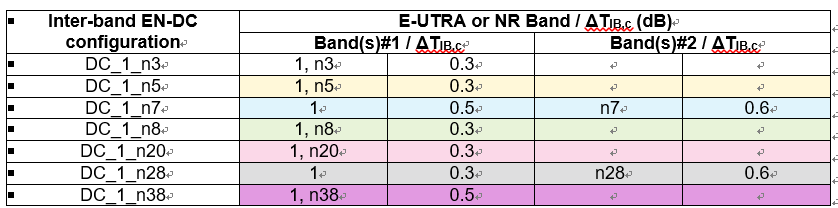
* Proposals
  + Option 1:



* + Option 2:



* + Option 3:



* + Option 4: Others.

**Issue 4-2B: If the optimization to tables of ΔTIB,c and ΔRIB,c is acceptable, when is the appropriate time to apply to RAN4 spec?**

* Proposals
  + Option 1: Right now.
  + Option 2: To capture the template in TR now and apply to RAN4 spec in the meeting before the end of Rel-17.
  + Option 3: Other.

## Companies views’ collection for 1st round

### Open issues

* **Sub topic 4-1 Optimization to channel bandwidths for each NR band**

Issue 4-1A: Is the optimization to the table of UE channel bandwidth per operating band acceptable? (R4-2104875 / R4-2104876)

Issue 4-1B: Is the optimization to the table of BS channel bandwidth per operating band acceptable? (R4-2104877)

|  |  |
| --- | --- |
| **Company** | **Comments** |
| ZTE | Issue 4-1A: Option 1.  Issue 4-1B: Option 1. |
| Huawei | 1. Any updates or corrections In the specifications should be from Rel-17 at least instead of Rel-16 in this WI. It isn’t maintenances. |
| CHTTL | Issue 4-1A and Issue 4-1B, are those really needed? it seems like the length of the table remains the same, we slightly prefer to keep the traditional way, would like to hear other companies view. |
| ZTE2 | To Huawei. Thanks for pointing out the issue. We are ok to update from Rel-17 on.  To CHTTL. Thank you for raising the question. Actually the table length for this optimization will be no change. However, if we look at the table for the bands on the second half page, the table heading for channel bandwidth is not shown. We cannot decide which column “Yes” refers to at first glance. In such case, we always need to scroll up to find which bandwidth it belongs to. Below is an example for this case. |
| Nokia | 4-1A: acceptable from REL17 but perhaps all CR’s are put on hold and implemented at the end of the SI  4-1B: should be submitted to some BS spec maintenance agenda in next meeting so relevant people see the proposal. It makes no sense to agree CR to BS spec in study on band combination handling |
| Apple | Issues 4-1A and 4-1B seems to propose just changing the “Yes” to a duplicated value of the column heading. We agree with CHTTL that the proposal doesn’t change the table size. |

* **Sub topic 4-2 Optimization to the tables of ΔTIB,c and ΔRIB,c**

Issue 4-2A: Which optimization to the tables of ΔTIB,c and ΔRIB,c is acceptable (R4-2104864)?

Issue 4-2B: If the optimization to tables of ΔTIB,c and ΔRIB,c is acceptable, when is the appropriate time to apply to RAN4 spec?

|  |  |
| --- | --- |
| **Company** | **Comments** |
| ZTE | Issue 4-2A: Option 3.  Issue 4-2B: Option 2. |
| Huawei | Issue 4-2A: Option 2 may be better than others. Putting different bands into the same cell may cause the confusion.  Issue 4-2B: Any updates or corrections In the specifications should be from Rel-17 at least in this WI. |
| CHTTL | Issue 4-2A: prefer option 1, since other options might leave a lot of empty cells. |
| ZTE2 | To Huawei. Regarding to Issue 4-2A, we have no strong opinion on Option 2 or 3. Our intention is to simplify the number of rows in the ΔTIB,c and ΔRIB,c tables. From this point of view, both Option 2 and 3 are ok.  To CHTTL. As pointed out in R4-2104864, in current RAN4 spec such as TS 38.101-3 v17.0.0, the ΔTIB,c and ΔRIB,c tables account for 1/6 pages of the total spec, i.e., 110 pages out of 610 pages in the length of the spec. We believe that the main problem for optimization is that the ΔTIB,c and ΔRIB,c tables are too redundant. With regard to Option 1, we see that reduction ratio is much lower than Option 2 or 3. |
| Nokia | 4-2A: None of the options look “perfect” thus option 4 which is to comeback in next meeting. But from first three ones maybe option 1.  4-2B: Option 3 continue discussion and once agreement is reached then TR is updated and REL17 specs also, This needs to be done before end of REL17. |
| Apple | Issue 4-2A: Option 1 seems to be a reasonable way to limit the table size; Option 2 and 3 seem to detract from the overall readability.  Issue 4-2B: Agree with Huawei: the earliest these changes can be applied is in Rel-17. |

### CRs/TPs comments collection

*Major close to finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2104875 | ZTE: See above. |
| Huawei: See above. |
| Nokia: acceptable from REL17 but perhaps all CRS are put on hold and implemented at the end of the SI |
| R4-2104876 | ZTE: See above. |
| Huawei: See above. |
| Nokia: acceptable from REL17 but perhaps all CRS are put on hold and implemented at the end of the SI |
| R4-2104877 | ZTE: See above. |
| Huawei: See above. |
| Nokia: should be submitted to some BS spec maintenance agenda in next meeting so relevant people see the proposal. It makes no sense to agree CR to BS spec in study on band combination handling |

## 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#4-1** | * **Sub topic 4-1 Optimization to channel bandwidths for each NR band**   **Issue 4-1A: Is the optimization to the table of *UE channel bandwidth* per *operating band* acceptable? (R4-2104875 / R4-2104876)**   * Proposals   + Option 1: Yes.     - ZTE, Nokia   + Option 2: No.   + Other comments:     - Huawei: Any updates or corrections in the specifications should be from Rel-17     - CHTTL, Apple: Length of the table remains the same   **Issue 4-1B: Is the optimization to the table of *BS channel bandwidth* per *operating band* acceptable? (R4-2104877)**   * Proposals   + Option 1: Yes.     - ZTE, Nokia (re-submit under BS maintenance AI in next meeting)   + Option 2: No.   *Some companies raised concerns that the modification does not reduce the length of the table. The contributor of the proposals explains that the draft CR is to optimize the readability of the table. For the bands on the second half page of the table, in current spec we always need to scroll up to find which bandwidth it belongs to.*  *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round: Further discuss the necessity of modification in the draft CR. If agreed, it should be started from Rel-17.* |
| **Sub-topic#4-2** | * **Sub topic 4-2 Optimization to the tables of ΔTIB,c and ΔRIB,c**   **Issue 4-2A: Which optimization to the tables of ΔTIB,c and ΔRIB,c is acceptable (R4-2104864)?**   * Proposals   + Option 1     - CHTTL, Apple, Nokia   + Option 2     - Huawei   + Option 3     - ZTE   + Option 4.   **Issue 4-2B: If the optimization to tables of ΔTIB,c and ΔRIB,c is acceptable, when is the appropriate time to apply to RAN4 spec?**   * Proposals   + Option 1: Right now.   + Option 2: To capture the template in TR now and apply to RAN4 spec in the meeting before the end of Rel-17.     - ZTE   + Option 3: Other.     - Nokia: Continue discussion and once agreement is reached then TR is updated and REL17 specs also, This needs to be done before end of REL17.     - Huawei, CHTTL: Any updates or corrections in the specifications should be from Rel-17.   *Companies have different views toward the optimization to the tables of ΔTIB,c and ΔRIB,c. It is suggested to comeback in next meeting. In this meeting, a WF is suggested to be discussed in 2nd round.*  *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round: Further discuss a WF on Optimization to the tables of ΔTIB,c and ΔRIB,c in 2nd round.* |

### 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** |
| R4-2104875 | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |
| R4-2104876 | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |
| R4-2104877 | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## 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”.*

* **Sub topic 4-1 Optimization to channel bandwidths for each NR band**

*Further discuss the necessity of modification in the draft CR. If agreed, it should be started from Rel-17.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2104875 | ZTE: The original intention of this draft CR is not to shorten the table size but to resolve the readability issue of the channel bandwidth table. For those bands displayed on the second half of the screen, it’s difficult for us to determine which column a certain “yes” in the table refers to since the table heading is only shown on the first page of the table. So if we want to know the exact channel bandwidth for the bands listed on the second half of the screen, we have to scroll up to check the table headings. This will make the readability worse. Furthermore, this optimization is not a new one, since the tables in clause 5.5A.3 also use such approach. Regarding to the comments received in 1st round, we are ok to bring the CR from Rel-17. And for the BS part we can also comeback next meeting in TEI agenda. |
| Nokia we agree that readability is improved. This is REL17 SI no REL16 CR is possible. Should investigate how to get rid of scs aspect of table as it is clear that 5 MHz in only 15 kHz scs etc. This information can be included as normative text before the table. |
| Company C: |
| R4-2104876 | ZTE: See above. |
| Nokia we agree that readability is improved. This is REL17 SI no REL16 CR is possible. Should investigate how to get rid of scs aspect of table as it is clear that 5 MHz in only 15 kHz scs etc. This information can be included as normative text before the table. |
| Company C: |
| R4-2104877 | ZTE: See above. |
| Nokia Submit to BS maintenance agenda in next meeting This is REL17 SI no REL16 CR is possible. |
| Company C: |

* **Sub topic 4-2 Optimization to the tables of ΔTIB,c and ΔRIB,c**

*WF on Optimization to the tables of delta TIB and RIB*

|  |  |
| --- | --- |
| **Company** | **Comments** |
| ZTE | We have uploaded the WF as below. Further comments are welcome.  https://www.3gpp.org/ftp/tsg\_ran/WG4\_Radio/TSGR4\_98bis\_e/Inbox/Drafts/%5B98bis-e%5D%5B144%5D%20FS\_BC\_Handling/Round%202/R4-21xxxxx\_WF%20on%20optimization%20to%20the%20tables%20of%20delta%20TIB%20and%20RIB.pptx |
| Nokia | We want to also study “rule” based approach on drastic reduction of need for dTib and dRib tables. But as WF mentioned “Other options for optimization are not precluded” we assume this is possible. We try to bring paper for next meeting, |
| ZZZ |  |

# Recommendations for Tdocs

## 1st round

**New tdocs**

|  |  |  |
| --- | --- | --- |
| **Title** | **Source** | **Comments** |
| *WF on Handling of SDL related EN-DC combinations* | *[CHTTL]* |  |
| *WF on Optimization to the tables of delta TIB and RIB* | *ZTE* |  |
| *TP on rules and guidelines for specifying band combinations* | *Apple* |  |
| *TR skeleton 38.XXX V001 Band combination handling* | *ZTE* |  |
|  |  |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| *R4-2104892* | *TP on rules and guidelines for specifying band combinations* | *Apple* | *Revised* |  |
| *R4-2104874* | *TR skeleton 38.XXX V001 Band combination handling* | *ZTE* | *Revised* |  |
| *R4-2104864* | *Further considerations on delta TIB and RIB simplification for band combinations* | *ZTE* | *Noted* |  |
| *R4-2104865* | *On band combination handling* | *ZTE* | *Noted* |  |
| *R4-2104875* | *draft CR to TS 38.101-1 on optimization to channel bandwidth per operating band (Rel-16)* | *ZTE* | *2nd Round* |  |
| *R4-2104876* | *draft CR to TS 38.101-2 on optimization to channel bandwidth per operating band (Rel-16)* | *ZTE* | *2nd Round* |  |
| *R4-2104877* | *draft CR to TS 38.104 on optimization to BS channel bandwidths and SCS per operating band (Rel-16)* | *ZTE* | *2nd Round* |  |
| *R4-2106683* | *Discussion on Band combination handling* | *Huawei, HiSilicon* | *Noted* |  |
| *R4-2107045* | *Discussion on guidelines for handling SDL related EN-DC combinations* | *CHTTL* | *Noted* |  |

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