**3GPP TSG-RAN WG4 Meeting # 98-e 　　　R4-20xxxxx**

**Electronic Meeting, 25 January – 5 February, 2021**

**Agenda item:** 16.1

**Source:** Moderator (NTT DOCOMO, INC.)

**Title:** Email discussion summary for [98e][153] BC\_simplification

**Document for:** Information

# Introduction

*In this email discussion we will handle following contributions submitted in AI 16.1: Simplification of band combinations in RAN4 specifications.*

*Following three topics are discussed in this summary:*

* ***Topic #1:* *Handling of agreements about band combinations***
  + *R4-2100089, R4-2100120 (also treated in Topic#2)*
* ***Topic #2: On optimization for band combination in RAN4 specifications***
  + *R4-2100120(also treated in Topic#1), R4-2100121, R4-2100122, R4-2100123, R4-2100124, R4-2100125, R4-2100126*
* ***Topic #3: LS on change of methodology for new LTE-CA REL-17 combinations***
  + *R4-2101818*

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| --- | --- | --- | --- |
| **Reference** | **TDoc** | **Title** | **Source** |
| [1] | [**R4-2100089**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100089.zip) | Handling of agreements about band combinations | Nokia, Nokia Shanghai Bell |
| [2] | [**R4-2100120**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100120.zip) | On optimization for band combination in RAN4 specifications | ZTE Corporation |
| [3] | [**R4-2100121**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100121.zip) | CR to TS 38.101-1 on optimization on delta TIB and RIB for band combinations (Rel-16) | ZTE Corporation |
| [4] | R4-2100122 | CR to TS 38.101-1 on optimization on delta TIB and RIB for band combinations (Rel-17) | ZTE Corporation |
| [5] | [**R4-2100123**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100123.zip) | CR to TS 38.101-2 on optimization on delta RIB for inter-band CA (Rel-16) | ZTE Corporation |
| [6] | R4-2100124 | CR to TS 38.101-2 on optimization on delta RIB for inter-band CA (Rel-17) | ZTE Corporation |
| [7] | [**R4-2100125**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100125.zip) | CR to TS 38.101-3 on optimization on delta TIB and RIB for inter-band EN-DC (Rel-16) | ZTE Corporation |
| [8] | R4-2100126 | CR to TS 38.101-3 on optimization on delta TIB and RIB for inter-band EN-DC (Rel-17) | ZTE Corporation |
| [9] | [**R4-2101818**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101818.zip) | Draft LS on change of methodology for new LTE-CA REL-17 combinations | Huawei, HiSilicon |

# Topic #1: Handling of agreements about band combinations

## Companies’ contributions summary

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| --- | --- | --- | --- |
| **Reference** | **T-doc number** | **Company** | **Proposals / Observations** |
| [1] | [**R4-2100089**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100089.zip) | Nokia, Nokia Shanghai Bell | **Proposal: Start to collect all the agreements by means of Permanent Document. If a SI is approved in the future, move the content of the Permanent Document to a TR for the SI.** |
| [2] | [**R4-2100120**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100120.zip) | ZTE Corporation | **Observation 1: Document type “*PRD*” is not widely used in 3GPP working groups although some working groups do retain some documents informally as internal files.**  **Observation 2: It’s hard for people to retrieve what a “*PRD*” document with a certain number refers to and specifies for what? More management efforts in RAN4 on document type “*PRD*” will be needed in the future.**  **Observation 3: For the purpose of establishing band combination optimization SI, it is to create a document that can be widely known not only by RAN4 but also by other 3GPP working groups or even by other industrial partners outside 3GPP.**  **Observation 4: The efforts on optimization for band combination should be visible in the RAN4 TU budget table.**  **Proposal 1: It is suggested to generate a regular SI to collect all the agreements and principles for band combination optimizations in a TR.**  *#Proposal 2, 3, and 4 are omitted here since those proposals are treaded in section 2 in Topic#2.* |

## Open issues summary

*NOTE: Since one paper has proposals on several topics on simplification, Topic#1 handle all proposals related to NR specification TS 38.101. Since R4-2100120 has a proposal on optimization for band combinations in RAN4 specifications, R4-2100120 is also listed in section 2 in Topic#2.*

### Sub-topic 1-1: Handling of agreements about band combinations

*This sub-topic discusses proposals from [1][2]*

**Issue 1-1-A: Handling of agreements about band combinations**

Proposals

* Option1: Use Permanent Documents that is defined in Section 9.1 in TS21.900.
  + A specific example can be seen in the following link. <https://www.3gpp.org/ftp/tsg_ran/WG5_Test_ex-T1/PRD>
* Option 2: RAN4 keeps carrying out current activities under the dedicated agenda item. RAN4 internally has a document, which may be with a t-doc or without it, to collect all the agreements. When the document becomes stable, a SI within one Quarter is generated just to create a TR.
* Option 3: Just simply generate a SI whose objectives just reflect what RAN4 has been addressing. All the agreements are collected in a TR for this SI.
* Option 4: Start to collect all the agreements by means of Permanent Document. If a SI is approved in the future, move the content of the Permanent Document to a TR for the SI. *# Proposal from [1]*

## Companies views’ collection for 1st round

### Open issues

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| **Sup-topic** | **Issue** | **Comments** |
| **1-1:**  **Handling of agreements about band combinations** | **Issue 1-1-A** | ZTE: Option 3.  For Permanent Document, due to the informal document in RAN4, it's hard for people in other working groups or even people outside 3GPP to reference in the spec. We agree that it is not worthwhile spending too much time on selecting the way to document the achieved agreements. What the most important now is to start the work on optimization for band combination and collect the agreements. Considering that R17 has already started, the later the band combination rules are determined, the more influence on the protocol modification will be. At present, the redundancy of band combination in the spec is mainly due to the lack consideration of BC simplification at the early stages such as R15 and R16. We believe that the determination of rules can be relatively stable after the SI research period ends. Although further modification is not excluded in BC, it should not be a wide range of changes, and it should not be a release based continual SI just like what basket WIs do right now. Based on the above consideration, we suggest option 3. |
| Huawei: We support option 2 or 3. |
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### 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.*

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| --- | --- |
| **CR/TP number** | **Comments collection** |
| *None* |  |
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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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| **Sub-topic** | **Status summary** |
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*Recommendations on WF/LS assignment*

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| --- | --- | --- |
| **T-doc** | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
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### CRs/TPs

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

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| **CR/TP number** | **CRs/TPs Status update recommendation** |
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## Discussion on 2nd round (if applicable)

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| **CR/TP/LS/WF number** | **Comments collection** |
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## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

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| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
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# Topic #2: On optimization for band combination in RAN4 specifications

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

## Companies’ contributions summary

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| **Reference** | **T-doc number** | **Company** | **Proposals / Observations** |
| [2] | [**R4-2100120**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100120.zip) | ZTE Corporation | *#Proposal 1 is omitted here since the proposal is treaded in section 1 in Topic#1.*  **Proposal 2: To further simplify the NR CA configuration for inter-band CA, the table template for two-band CA can be shown as in Fig 5 if more channel bandwidths are introduced.**  **Proposal 3: To further simplify the NR inter-band CA configurations with three or four bands, the templates for the configuration table can be organized as two options:**  ***Option (a)*: *All bands for channel bandwidth filled in one row***  ***Option (b)*: *All bands for channel bandwidth filled in two rows***  **To better adapt more new channel bandwidth introduced in the future, *Option (b)* in Fig 6 is preferred.**    **Proposal 4: To simplify ΔTIB,c and ΔRIB,c tables for band combinations, it is suggested to** **use the format of “E-UTRA or NR Band / ΔTIB,c (dB)” and “E-UTRA or NR Band / ΔRIB,c (dB)” shown as an example in Fig 8, with which the ΔTIB,c and ΔRIB,c values can be listed within one row for each configuration.** |
| [3] | [**R4-2100121**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100121.zip) | ZTE Corporation | To simplify the ΔTIB,c and ΔRIB,c tables for inter-band CA and SUL by using the format of “NR Band / ΔTIB,c (dB)” and “NR Band / ΔRIB,c (dB)”. |
| [4] | R4-2100122 | ZTE Corporation | *#Mirror CR of R4-1200121* |
| [5] | [**R4-2100123**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100123.zip) | ZTE Corporation | 1. To simplify the ΔRIB tables for inter-band CA by using the format of “NR Band / ΔRIB (dB)”. 2. Change “NR CA bands” to “Inter-band CA Combination”. |
| [6] | R4-2100124 | ZTE Corporation | *#Mirror CR of R4-1200123* |
| [7] | [**R4-2100125**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100125.zip) | ZTE Corporation | 1. To simplify the ΔTIB,c and ΔRIB,c tables for inter-band EN-DC by using the format of “E-UTRA or NR Band / ΔTIB,c (dB)” and “E-UTRA or NR Band / ΔRIB,c (dB)”. 2. Remove DC\_1-18-41\_n3, DC\_1-18-41\_n77 and DC\_1-18-41\_n78 from ΔTIB,c table for three bands. 3. Remove the redundant value for DC\_41-42\_n78 from Table 6.2B.4.2.3.2-1. |
| [8] | R4-2100126 | ZTE Corporation | *#Mirror CR of R4-1200125* |

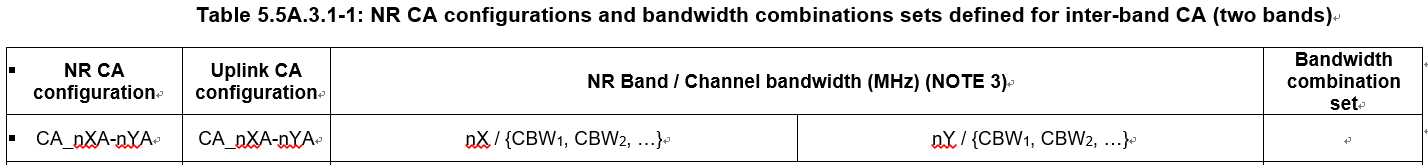
## Open issues summary

### Sub-topic 2-1: Simplification on NR inter-band CA configuration table

*This sub-topic discusses the proposals from [2].*

**Issue 2-1-A: Simplification on NR inter-band CA configuration table for 2 bands NR CA**

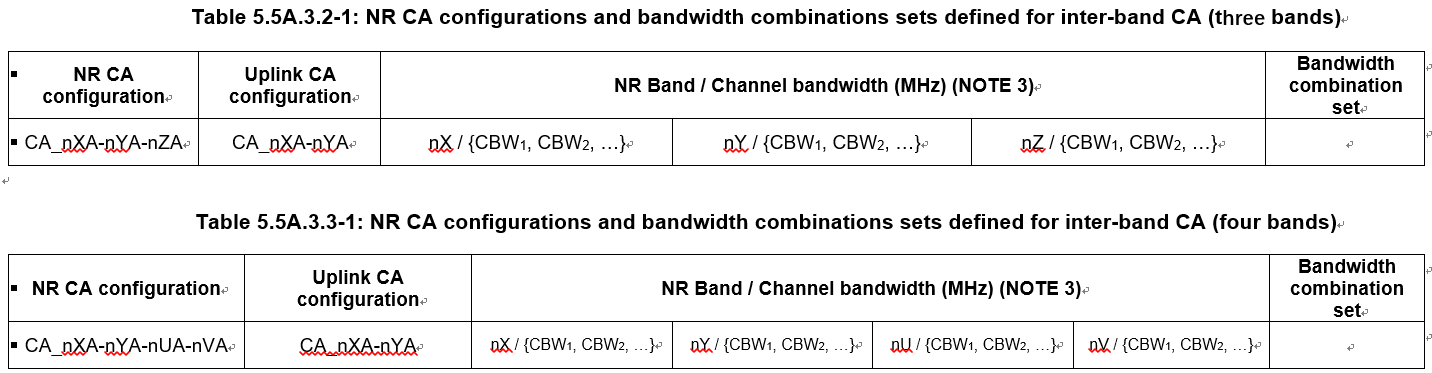
* Proposals
  + Option 1: The table template for two-band CA applies shown as in Fig 5 if more channel bandwidths are introduced. *#Proposal 2 from [2]*



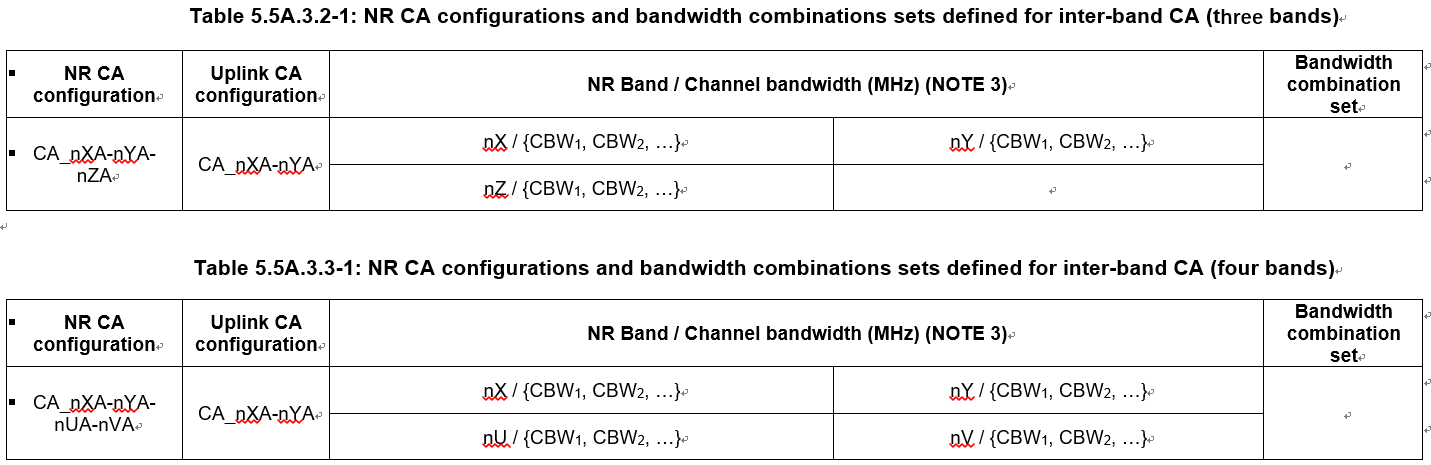
* + Option 2: Other

**Issue 2-1-B: Simplification on NR inter-band CA configuration table for more than 2 bands NR CA,**

* Proposals
  + Option (a): All bands for channel bandwidth filled in one row. *#Proposal 3 from [2]*



* + Option (b): Option (b): All bands for channel bandwidth filled in two rows *#Proposal 3 from [2]*



* + Option (c): Other

### Sub-topic 2-2: Simplification on ΔTIB,c and ΔRIB,c tables for band combinations

*This sub-topic discusses the proposals from [2][3][4][5][6][7][8].*

**Issue 2-2-A: Simplification on ΔTIB,c and ΔRIB,c tables for band combinations**

* Proposals　*#Proposal 4 from [2]*
  + Option 1: Use the format of “E-UTRA or NR Band / ΔTIB,c (dB)” and “E-UTRA or NR Band / ΔRIB,c (dB)”
    - Shown as an example in Fig 8, with which the ΔTIB,c and ΔRIB,c values can be listed within one row for each configuration.



* + Option 2: Other

## Companies views’ collection for 1st round

### Open issues

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| **Sup-topic** | **Issue** | **Comments** |
| **2-1:**  Simplification on NR inter-band CA configuration table for 2 bands NR CA | **Issue 2-1-A:**  For 2 bands CA | Huawei:  1. For simplification on configuration, all the channel bandwidths can be filled in one cell as below.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | NR CA configuration | Uplink CA configuration | NR Band | Channel bandwidth | BCS | | CA\_n1A-n3A | CA\_n1A-n3A | n1 | 5, 10, 15, 20 | 0 | |  |  | n3 | 5, 10, 15, 20, 25, 30 |  |   2. It can be implemented from Rel-17 since more channel bandwidths will be introduced. No need to increase workload from Rel-16.  3. If any agreements about configuration are reached, it's recommended that NR CA basket rapporteur can implement big CR from Rel-17 to avoid some duplicated work in this meeting.  ZTE2: Option 1. Reply to Huawei:  (1) There is no need to fill the channel bandwidth for NR band by line. It will double the size of 2-band CA configuration table. If take the template as in Option 1, the CA\_n1A-n3A will be shown as below, in which each configuration only occupies one row. The template can not only solve the problem of explosive table size, but also solve the problem of increasing channel bandwidths in one row.    (2) No strong opinion on which release will be introduced. The earlier introduced, the less impact it will be.  (3) It depends on what agreements achieved. Duplicated work should be avoided.  Nokia: We really thanks ZTE for this effort. This has some positive effect but may not be drastic while lose some readability if the number of bands increases…At least what Huawei proposed would not work because it does not decrease the number of row.  Qualcomm: Thanks for ZTE’s great efforts. However, we don’t see much benefit by this approach. The size of table would be different for different bands, e.g., n1 vs n79. We still need more rows for SCSs. |
| **Issue 2-1-B**  For more than 2bands CA | Huawei: Same comments on Issue 2-1-A  ZTE2: To balance between NR band in row and channel bandwidth in column, we prefer Option (b). Reply to Huawei:  (1) For inter-band CA with more than 2 bands, if using the method as you suggested, the configuration table size will be much larger than using the template as shown in Option (a) or (b).  Qualcomm: See the comments above. |
| **2-2:**  Simplification on ΔTIB,c and ΔRIB,c tables for band combinations | **Issue 2-2-A** | Huawei: 1. For Simplification on TIB RiB, there seems to be no gain but increase workload. No need to use this simplification.  ZTE2: Option 1. Reply to Huawei:  (1) With the increasing number of CA/DC configurations introduced, the configuration table has become more and more complicated. This is also one of the urgent problems needs to be solved in RAN4. According to our proposed CRs, in 101-1 the optimization can reduce the configuration table size from 19 pages to 9 pages, while in 101-3 from 89 pages to 43 pages for Rel-16. The size of spec optimize more than 50% in pages while no info lost. With the number of combinations increases in the future releases, the optimization effect of option 1 will be more obvious.  Nokia: This can surely reduce the number of pages but decrease readability. Can we go with somewhere in middle?  Qualcomm: Share the similar view with Nokia. The change will lead to low readability.    CHTTL: thanks ZTE for this effort, same view as Nokia, and this format might result in lots of empty cell due to the zero value on some bands. |

### 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** |
| [**R4-2100121**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100121.zip) | Company A |
| Company B |
|  |
| R4-2100122 | *# Mirror CR of R4-2100121* |
| [**R4-2100123**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100123.zip) | Company A |
| Company B |
|  |
| R4-2100124 | *# Mirror CR of R4-2100123* |
| [**R4-2100125**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100125.zip) | Company A |
| Company B |
|  |
| R4-2100126 | *# Mirror CR of R4-2100125* |

## 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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| **Sub-topic** | **Status summary** |
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*Suggestion on WF/LS assignment*

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| --- | --- | --- |
| **T-doc** | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
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### 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)

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| **CR/TP/LS/WF number** | **Comments collection** |
|  |  |

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
|  |  |

# Topic #3: LS on change of methodology for new LTE-CA REL-17 combinations

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

## Companies’ contributions summary

|  |  |  |  |
| --- | --- | --- | --- |
| **Reference** | **T-doc number** | **Company** | **Proposals / Observations** |
| [9] | [**R4-2101818**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101818.zip) | Huawei, HiSilicon | *# Draft LS on change of methodology for new LTE-CA REL-17 combinations* |

## Open issues summary

### Sub-topic 3-1: Alternative to creating new BCSs

*This sub-topic discusses the proposals from [9]*

**Issue 3-1-A: LS on change of methodology for new LTE-CA REL-17 combinations**

* Proposals
  + Option 1: Send LS as proposed in [9].
  + Option 2: Send LS with modification on the draft LS
  + Option 3: Other

## Companies views’ collection for 1st round

### Open issues

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| --- | --- | --- |
| **Sup-topic** | **Issue** | **Comments** |
| **3-1:** | **Issue 3-1-A** | Huawei: Option 1 |
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### 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** |
| *None* |  |
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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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| **Sub-topic** | **Status summary** |
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*Suggestion on WF/LS assignment*

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| --- | --- | --- |
| **T-doc** | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
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### 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)

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| **CR/TP/LS/WF number** | **Comments collection** |
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## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

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| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
|  |  |