**3GPP TSG-RAN WG4 Meeting # 98-e R4-210xxxx**

**Electronic Meeting, Jan. 25-Feb. 5, 2021**

**Agenda item:** 9.33.1

**Source:** Moderator (China Telecom)

**Title:** Email discussion summary for [98e][131] DL\_intrpt\_combos\_TxSW\_R17

**Document for:** Information

# Introduction

This email discussion thread is related to Downlink interruption for band combinations basket WI, and will focus on the topic of following aspects:

* Topic #1: TR skeleton, work plan and revised WID
* Topic#2: Downlink interruption analysis
	+ Issue 2-1-1: DL interruption applicability for inter-band CA with 3bands
	+ Issue 2-1-2: TP’s for approval

Note that the tables for collecting comments for sub-topic issues are arranged just below each issue.... and the tables for collecting comments for CR/TP are still kept at the original position.

# Topic #1: TR skeleton, work plan and revised WID

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations/Abstracts** |
| R4-2100373 | CATT | TR skeleton for Downlink interruption for band combinations to conduct dynamic Tx Switching |
| R4-2100374 | CATT | TR 37.xxx 0.1.0 for Downlink interruption for band combinations to conduct dynamic Tx Switching |
| R4-2101127 | China Telecom | Work plan on downlink interruption for band combinations to conduct dynamic Tx switching |
| R4-2101128 | China Telecom | revised WID, Update the WI title, code and TR remarks according to MCC suggestion |

## 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: Work plan, TR skeleton and revised WID

This sub-topic will discuss rapporteur input for TR skeleton, work plan and revised WID.

**Issue 1-1-1: TR skeleton, draft TR**

* Recommended WF
	+ It is recommended to agree TR skeleton of R4-2100373
	+ It is recommended for email approval for the draft TR of R4-2100374

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| **Company** | **Comments on Issue 1-1-1: TR skeleton, draft TR** |
|  |  |

**Issue 1-1-2: Revised WID**

* Summarization for the WID revision
	+ Update the WI title, code and TR remarks according to MCC suggestion.
* Recommended WF
	+ It is recommended to endorse the revised WID of R4-2101128

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| **Company** | **Comments on Issue 1-1-2: Revised WID** |
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**Issue 1-1-3: Work plan**

* Recommended WF
	+ It is recommended to approve the work plan of R4-2101127

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| **Company** | **Comments on Issue 1-1-3: Work plan** |
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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.*

|  |  |
| --- | --- |
|  | **Status summary**  |
| **Sub-topic#1** | *Tentative agreements:* No comments on the Work plan, TR skeleton and revised WID, the corresponding tdoc are recommended as approved.*Candidate options:**Recommendations for 2nd round:* No need discussion on 2nd round. Topic #1 is closed |

*Recommendations on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title**  | **Assigned Company,****WF or LS lead** |
| #1 |  |  |

### CRs/TPs

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

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation**  |
| R4-2100373 | agreed |
| R4-2100374 | for email approval |
| R4-2101127 | approved |
| R4-2101128 | endorsed |

## Discussion on 2nd round (if applicable)

Topic #1 is closed

## 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**  |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

# Topic #2: Downlink interruption analysis

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations/Abstracts** |
| R4-2100812 | CMCC | Proposal: It is proposed to list the list the uplink configurations for “no DL interruption allowed” for inter-band CA with more than 2 bands.  |
| [R4-2100806](file:///E%3A%5C01%20%E6%A0%87%E5%87%86%5C15%20Tx%20Switching%5CRAN4_98_e%5CDocs%5CR4-2100806.zip) | CMCC | TP on DL applicability of CA\_n3-n40-n41 for 37.xxx |
| [R4-2100807](file:///E%3A%5C01%20%E6%A0%87%E5%87%86%5C15%20Tx%20Switching%5CRAN4_98_e%5CDocs%5CR4-2100807.zip) | CMCC | TP on DL applicability of CA\_n3-n41-n79 for 37.xxx |
| [R4-2100808](file:///E%3A%5C01%20%E6%A0%87%E5%87%86%5C15%20Tx%20Switching%5CRAN4_98_e%5CDocs%5CR4-2100808.zip) | CMCC | TP on DL applicability of CA\_n8-n39-n41for 37.xxx |
| [R4-2100809](file:///E%3A%5C01%20%E6%A0%87%E5%87%86%5C15%20Tx%20Switching%5CRAN4_98_e%5CDocs%5CR4-2100809.zip) | CMCC | TP on DL applicability of CA\_n8-n41-n79 for 37.xxx |
| [R4-2100810](file:///E%3A%5C01%20%E6%A0%87%E5%87%86%5C15%20Tx%20Switching%5CRAN4_98_e%5CDocs%5CR4-2100810.zip) | CMCC | TP on DL applicability of CA\_n39-n41-n79 for 37.xxx |
| [R4-2100811](file:///E%3A%5C01%20%E6%A0%87%E5%87%86%5C15%20Tx%20Switching%5CRAN4_98_e%5CDocs%5CR4-2100811.zip) | CMCC | TP on DL applicability of CA\_n40-n41-n79 for 37.xxx |

## 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 2-1: Downlink interruption analysis

This sub-topic will discuss DL interruption applicability for inter-band CA with 3bands and corresponding TP’s for approval.

**Issue 2-1-1: DL interruption applicability for inter-band CA with 3bands**

* Proposals (R4-2100812)
	+ Proposal: It is proposed to list the list the uplink configurations for “no DL interruption allowed” for inter-band CA with more than 2 bands. The proposed specification changes are:

**Table 5.2A.2.2-1: Inter-band CA operating bands involving FR1 (three bands)**

|  |  |  |
| --- | --- | --- |
| **NR CA Band** | **NR Band****(Table 5.2-1)** | **NO DL interruption allowed** **(Note 3)** |
| CA\_n3-n40-n41 | n3, n40, n41 | CA n3-n40, CA n3-n41 |
| CA\_n3-n41-n79 | n3, n41, n79 | CA n3-n41, CA n3-n79, CA n41-n49 |
| CA\_n8-n39-n41 | n8, n39, n41 | CA n8-n39, CA n8-n41, CA n39-n41 |
| CA\_n8-n41-n79 | n8, n41, n79 | CA n8-n41, CA n8-n79, CA n41-n79 |
| CA\_n39-n41-n79 | n39, n41, n79 | CA n39-n79, CA n41-n79, CA n39-n41 |
| CA\_n40-n41-n791,2 | n40, n41, n79 | CA n40-n79, CA n41-n79 |
| NOTE 1: The frequency range below 2506 MHz for Band n41 is not used in this band combination.NOTE 2: Applicable for frequency range above 4800 MHz for Band n79 in this band combination.NOTE 3: Applicable when dynamic switching between two uplink carriers is conducted. The DL interruption requirement is specified in clause 8.2.2.2.10 of 38.133 [13]. |

* Recommended WF
	+ Collect views on this proposal

|  |  |
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| **Company** | **Comments on Issue 2-1-1: DL interruption applicability for inter-band CA with 3bands** |
| Nokia | We need a consistency at least within a specification… If Table 5.2A.2.1-1 captures combination which DL interruption is allowed, Table 5.2A.2.2-1 needs to follow the same way. |
| CHTTL | BTW, currently the DL interruption table for the fallback CA n3-n40 is empty, does it need to be updated (or need to be requested)?Another question just for clarification, can all of the DL interruption results of the 2 band CA/EN-DC apply to the higher order combos? or there might be some special cases, or there are some other general rules. Thanks. |
| CMCC | To Nokia: We are OK to further discuss how to keep the consistency in the spec. In Table 5.2A.2.1-1, “NO” is indicated in the “DL interruption allowed” column. If we follow the same logic, “No” means DL interruption is not allowed for all the UL band pairs. If not all the uplink band pairs mandate no DL interruption, then it is still necessary to list the uplink configurations. Maybe changes in the following way?

|  |  |  |
| --- | --- | --- |
| **NR CA Band** | **NR Band****(Table 5.2-1)** | **~~NO~~ DL interruption allowed** **(Note 3)** |
| CA\_n3-n40-n41 | n3, n40, n41 | No for CA n3-n40, CA n3-n41 |
| CA\_n3-n41-n79 | n3, n41, n79 | No ~~CA n3-n41, CA n3-n79, CA n41-n49~~ |
| CA\_n8-n39-n41 | n8, n39, n41 | No ~~CA n8-n39, CA n8-n41, CA n39-n41~~ |
| CA\_n8-n41-n79 | n8, n41, n79 | No ~~CA n8-n41, CA n8-n79, CA n41-n79~~ |
| CA\_n39-n41-n79 | n39, n41, n79 | No ~~CA n39-n79, CA n41-n79, CA n39-n41~~ |
| CA\_n40-n41-n791,2 | n40, n41, n79 | No for CA n40-n79, CA n41-n79 |
| NOTE 1: The frequency range below 2506 MHz for Band n41 is not used in this band combination.NOTE 2: Applicable for frequency range above 4800 MHz for Band n79 in this band combination.NOTE 3: Applicable when dynamic switching between two uplink carriers is conducted. The DL interruption requirement is specified in clause 8.2.2.2.10 of 38.133 [13]. |

To CHTTL: We also noticed that CA n3-n40 is not captured for no DL interuption. We can update is directly, or request it following the procedure of basket WI. Either way is OK.For the question, our understanding is Yes. All of the DL interruption results of 2 bands apply to higher order combos. |
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**Issue 2-1-2: TPs for approval**

* Proposed TPs
	+ R4-2100806, R4-2100807, R4-2100808, R4-2100809, R4-2100810, R4-2100811
* Recommended WF
	+ Collect the comments for proposed TPs in the section 2.3.1. If no comments for certain of TP’s, the TP’s will be recommended as approved.

## Companies views’ collection for 1st round

### CRs/TPs comments collection

The following table aims to collect the comments for proposed TPs. If no comments for certain of TP, the TP will be recommended as approved in the summary for 1st round.

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2100806 | company A: |
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| R4-2100807 |  |
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| R4-2100808 |  |
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| R4-2100809 |  |
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| R4-2100810 |  |
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| R4-2100811 |  |
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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.*

|  |  |
| --- | --- |
|  | **Status summary**  |
| **Sub-topic#1** | *Tentative agreements:* The relative TP’s need to be revised.*Candidate options:**Recommendations for 2nd round:* Does CMCC’s response address the comments? Continue discuss on the TP’s. |

*Recommendations on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **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*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation**  |
| [R4-2100806](file:///E%3A%5C01%20%E6%A0%87%E5%87%86%5C15%20Tx%20Switching%5CRAN4_98_e%5CDocs%5CR4-2100806.zip) | revised to R4-2103221 |
| [R4-2100807](file:///E%3A%5C01%20%E6%A0%87%E5%87%86%5C15%20Tx%20Switching%5CRAN4_98_e%5CDocs%5CR4-2100807.zip) | revised to R4-2103222 |
| [R4-2100808](file:///E%3A%5C01%20%E6%A0%87%E5%87%86%5C15%20Tx%20Switching%5CRAN4_98_e%5CDocs%5CR4-2100808.zip) | revised to R4-2103223 |
| [R4-2100809](file:///E%3A%5C01%20%E6%A0%87%E5%87%86%5C15%20Tx%20Switching%5CRAN4_98_e%5CDocs%5CR4-2100809.zip) | revised to R4-2103224 |
| [R4-2100810](file:///E%3A%5C01%20%E6%A0%87%E5%87%86%5C15%20Tx%20Switching%5CRAN4_98_e%5CDocs%5CR4-2100810.zip) | revised to R4-2103225 |
| [R4-2100811](file:///E%3A%5C01%20%E6%A0%87%E5%87%86%5C15%20Tx%20Switching%5CRAN4_98_e%5CDocs%5CR4-2100811.zip) | revised to R4-2103226 |

## Discussion on 2nd round (if applicable)

**Issue 2-1-2 (Continual): TPs for approval**

Continue discussion on the revised TPs in section 2.4.2.

The following table aims to collect the comments for revised TPs.

|  |  |
| --- | --- |
| **Company** | **Comments on Issue 2-1-2 (Continual): TPs for approval** |
| **CMCC** | **Regarding how to capture the DL interruption applicability for inter-band CA with more than 3 bands, there are two options****Option 1: list the DL interruption allowed UL band pairs for 3 bands CA.**

|  |  |  |
| --- | --- | --- |
| **NR CA Band** | **NR Band****(Table 5.2-1)** | **~~NO~~ DL interruption allowed** **(Note 3)** |
| CA\_n3-n40-n41 | n3, n40, n41 | No for CA n3-n40, CA n3-n41 |
| CA\_n3-n41-n79 | n3, n41, n79 | No ~~CA n3-n41, CA n3-n79, CA n41-n49~~ |
| CA\_n8-n39-n41 | n8, n39, n41 | No ~~CA n8-n39, CA n8-n41, CA n39-n41~~ |
| CA\_n8-n41-n79 | n8, n41, n79 | No ~~CA n8-n41, CA n8-n79, CA n41-n79~~ |
| CA\_n39-n41-n79 | n39, n41, n79 | No ~~CA n39-n79, CA n41-n79, CA n39-n41~~ |
| CA\_n40-n41-n791,2 | n40, n41, n79 | No for CA n40-n79, CA n41-n79 |
| NOTE 1: The frequency range below 2506 MHz for Band n41 is not used in this band combination.NOTE 2: Applicable for frequency range above 4800 MHz for Band n79 in this band combination.NOTE 3: Applicable when dynamic switching between two uplink carriers is conducted. The DL interruption requirement is specified in clause 8.2.2.2.10 of 38.133 [13]. |

**Option 2: Add additional note to 2 bands CA table, e.g.**Note8: Applicable for all the higher order CA configurations with the corresponding uplink band pairs.Suggestions on the wording of the note are welcome. And if option 2 is adopted, it seems that only 2 bands CA need to be requested. 3 bands or higher order CA can adopt the same conclusion automatically. Then do we still need the TPs for 3 bands CA?Table 5.2A.2.1-1: Inter-band CA operating bands involving FR1 (two bands)

|  |  |  |
| --- | --- | --- |
| NR CA Band | NR Band(Table 5.2-1) | DL interruption allowed (Note 7, 8) |
| CA\_n1-n3 | n1, n3 |  |
| CA\_n1-n7 | n1, n7 |  |
| CA\_n1-n8 | n1, n8 |  |
| CA\_n1-n28 | n1, n28 |  |
| CA\_n1-n40 | n1, n40 |  |
| CA\_n1-n41 | n1, n41 |  |
| CA\_n1-n77 | n1, n77 | No |
| CA\_n1-n78 | n1, n78 | No |
| CA\_n1-n79 | n1, n79 | No |
| CA\_n2-n5 | n2, n5 |  |
| CA\_n2-n48 | n2, n48 |  |
| CA\_n2-n66 | n2, n66 |  |
| CA\_n2-n77 | n2, n77 |  |
| CA\_n2-n78 | n2, n78 |  |
| CA\_n3-n7 | n3, n7 |  |
| CA\_n3-n8 | n3, n8 |  |
| CA\_n3-n28 | n3, n28 |  |
| CA\_n3-n38 | n3, n38 |  |
| CA\_n3-n40 | n3, n40 |  |
| CA\_n3-n41 | n3, n41 | No |
| CA\_n3-n771 | n3, n77 | No |
| CA\_n3-n781 | n3, n78 | No |
| CA\_n3-n791 | n3, n79 | No |
| CA\_n5-n7 | n5, n7 |  |
| CA\_n5-n66 | n5, n66 |  |
| CA\_n5-n77 | n5, n77 |  |
| CA\_n5-n78 | n5, n78 | No |
| CA\_n5-n79 | n5, n79 | No |
| CA\_n7-n25 | n7, n25 |  |
| CA\_n7-n28 | n7, n28 |  |
| CA\_n7-n66 | n7, n66 |  |
| CA\_n7-n78 | n7, n78 |  |
| CA\_n8-n391 | n8, n39 |  |
| CA\_n8-n40 | n8, n40 |  |
| CA\_n8-n41 | n8, n41 | No |
| CA\_n8-n751 | n8, n75 |  |
| CA n8-n781 | n8, n78 | No |
| CA\_n8-n791 | n8, n79 | No |
| CA\_n20-n282 | n20, n28 |  |
| CA\_n20-n75 | n20, n75 |  |
| CA\_n20-n78 | n20, n78 |  |
| CA\_n25-n41 | n25, n41 |  |
| CA\_n25-n466 | n25, n46 |  |
| CA\_n25-n66 | n25, n66 |  |
| CA\_n25-n71 | n25, n71 |  |
| CA\_n25-n78 | n25,n78 |  |
| CA\_n28-n40 | n28, n40 |  |
| CA\_n28-n41 | n28, n41 |  |
| CA\_n28-n50 | n28, n50 |  |
| CA\_n28-n752 | n28, n75 |  |
| CA\_n28-n77 | n28, n77 | No |
| CA\_n28-n781 | n28, n78 | No |
| CA\_n29-n66 | n29, n66 |  |
| CA\_n29-n70 | n29, n70 |  |
| CA\_n38-n66 | n38, n66 |  |
| CA\_n38-n781 | n38, n78 |  |
| CA\_n39-n40 | n39, n40 |  |
| CA\_n39-n41 | n39, n41 | No |
| CA\_n39-n791 | n39, n79 | No |
| CA\_n40-n41 | n40, n41 |  |
| CA\_n40-n78 | n40, n78 |  |
| CA\_n40-n791,4 | n40, n79 | No |
| CA\_n41-n501 | n41, n50 |  |
| CA\_n41-n66 | n41, n66 |  |
| CA\_n41-n711 | n41, n71 |  |
| CA\_n41-n78 | n41, n78 |  |
| CA\_n41-n791,3 | n41, n79 | No |
| CA\_n46-n486 | n46, n48 |  |
| CA\_n46-n666 | n46, n66 |  |
| CA\_n48-n66 | n48, n66 |  |
| CA\_n50-n78 | n50, n78 |  |
| CA\_n66-n70 | n66, n70 |  |
| CA\_n66-n71 | n66, n71 |  |
| CA\_n66-n77 | n66, n77 |  |
| CA\_n66-n78 | n66, n78 |  |
| CA\_n70-n71 | n70, n71 |  |
| CA\_n75-n781 | n75, n78 |  |
| CA\_n76-n781 | n76, n78 |  |
| CA\_n77-n79 | n77, n79 |  |
| CA\_n78-n795 | n78, n79 |  |
| CA\_n78-n92 | n78, n92 |  |
| NOTE 1: Applicable for UE supporting inter-band carrier aggregation with mandatory simultaneous Rx/Tx capability.NOTE 2: The frequency range in band n28 is restricted for this band combination to 703-733 MHz for the UL and 758-788 MHz for the DL.NOTE 3: The frequency range below 2506 MHz for Band n41 is not used in this combination.NOTE 4: Applicable for frequency range above 4800 MHz for Band n79 in this combination.NOTE 5: Simultaneous Rx/Tx capability does not apply for UEs supporting band n78 with a n77 implementation.NOTE 6: The PCell is allocated in the licensed band in this combination.NOTE 7: Applicable when dynamic switching between two uplink carriers is conducted. The DL interruption requirement is specified in clause 8.2.2.2.10 of 38.133 [13].NOTE 8: Applicable for all the higher order CA configurations with the corresponding uplink band pairs.  |

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| **Nokia** | Thanks CMCC for taking into account our comment. It looks better. Perhaps, I think that it may be better to add that NOTE into tables for higher order combinations saying something like DL interruption applicability for all the CA configurations in this table shall be the same as those for the corresponding uplink band pairs in Table 5.2A.2.1-1. |
| **MediaTek** | To CMCC, my apologies we missed comment for round 1. We have concern on 3 bands or higher order CA can adopt the same conclusion automatically if there’s no DL interruption on 2 bands. For example, UL\_CA\_n3-n40, there’s no DL interruption for two band combination. But if the third band is band n1, then DL interruption would be needed for n1.In our view, it would be ok on 4 bands or higher order CA can adopt the same conclusion automatically if there’s no DL interruption on 2 bands and 3 bands. Table for 3-bands combinations for DL interruption indication is also needed.  |
| **CHTTL** | Thanks CMCC for taking into account our comment and listing the options, actually we don’t have strong view, our original comment is a clarification question. if all of the 2 band results can be applied to the higher order, them a note seems better, but if not, we are also fine with the table.  |
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