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

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

**Agenda item:** 5.6.1, 5.6.2.2.1, 5.6.2.2.3, 5.6.2.2.6

**Source:** Moderator (ZTE Corporation)

**Title:** Email discussion summary for [98-bis-e][210] NR\_RRM\_Enh\_2

**Document for:** Information

# Introduction

TDocs submitted to the following agenda items will be treated:

- 5.6.1 RRM core requirements maintenance (38.133)

- 5.6.2.2.1 SRS carrier switching requirements

- 5.6.2.2.3 CGI reading requirements with autonomous gap

- 5.6.2.2.6 Mandatory MG patterns

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

* 1st round: Companies provide comments on draft CRs and discuss open issues
* 2nd round: Finalize on the open issues. Check if revised draft CRs can be endorsed.

# Topic #1: Core Maintenance

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2104481 | ZTE Corporation | **Proposal 1: Clarify that the interruption requirements for SRS carrier based switching only apply for same frequency ranges but not across different frequency ranges.**  **Proposal 2: The clarification shall also be added to R17 spec through a Cat A CR.** |
| R4-2106611 | vivo, Qualcomm, Huawei, HiSilicon, MediaTek Inc., Apple, Nokia | Draft CR to 38.133 correction on SRS carrier based switchig core requirements  Summary of change:   * Removed requirements for NR SRS carrier based switching between FR1 and FR2 |
| R4-2106612 | Vivo | *Observation 1: SRS carrier switching between FR1 and FR2 was never discussed in RF session.*  ***Proposal 1: Remove interruption requirements for SRS carrier switching between FR1 and FR2.***  ***Proposal 2: No new UE capability is needed, at least in R16, to indicate the UE is capable of SRS carrier switching between FR1 and FR2.***  ***Proposal 3: LS to RAN2 to clarify that UE capability*** *SRS-SwitchingTimeNR* ***is to indicate interruption time during RF retuing for SRS carrier switching between a carrier on one band and another (PUSCH-less) carrier on the other band in the same frequency range to transmit SRS.*** |
| R4-2106930 | Huawei, HiSilicon | Correction on SRS carrier switching  Summary of change:   1. ENDC, revised the condition to “the SRS switching is not colliding with any SSB/CSI-RS based measurements in SCG”; 2. In SA, adding the condtion “the SRS switching is not colliding with any SSB/CSI-RS based measurements”; 3. In NEDC, adding the condtion “the SRS switching is not colliding with any SSB/CSI-RS based measurements in MCG”; 4. In NRDC, adding the condtion “the SRS switching is not colliding with any SSB/CSI-RS based measurements”; |

## 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 Remove core requirements on SRS carrier switching between FRs

*Sub-topic description:*

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

**Issue 1-1: Whether to remove interruption requirements for SRS carrier switching between FR1 and FR2**

* Proposals
  + Option 1: Remove interruption requirements for SRS carrier switching between FR1 and FR2 (ZTE, vivo, Qualcomm, Huawei, HiSilicon, MediaTek Inc., Apple, Nokia)
    - Option 1a: The clarification shall also be added to R17 spec through a Cat A CR. (ZTE)
* Recommended WF
  + Can we go with Option 1 / Option 1a?

**Issue 1-2: New UE capability**

* Proposals
  + Option 1: No new UE capability is needed, at least in R16, to indicate the UE is capable of SRS carrier switching between FR1 and FR2. (vivo)
* Recommended WF
  + Can we go with Option 1?

**Issue 1-3: Send LS to RAN2 on UE capability SRS-SwitchingTimeNR**

* Proposals
  + Option 1: LS to RAN2 to clarify that UE capability SRS-SwitchingTimeNR is to indicate interruption time during RF retuing for SRS carrier switching between a carrier on one band and another (PUSCH-less) carrier on the other band in the same frequency range to transmit SRS. (vivo)
* Recommended WF
  + Can we go with Option 1?

## Companies views’ collection for 1st round

### Open issues

*One of the two formats, i.e. either example 1 or 2 can be used by moderators.*

**Example 1**

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Issue 1-1:  Issue 1-2:  Issue 1-3: |
| ZTE | Issue 1-1: Support Option 1 and 1a.  Issue 1-2: Support Option 1. No new UE capability is needed as no UE currently supports this. |
| Huawei | Issue 1-1: Support option 1.  Issue 1-2: Support option 1. |
| Nokia | Issue 1-1: Fine with the recommended WF.  Issue 1-2: We understood such capability is needed only if some UE is capable of SRS carrier switching between FR1 and FR2. If this is not the case, probably no need to introduce new capability for now.  Issue 1-3: We don’t see it necessary to send LS to RAN2 or change the existing capability. Currently the problem arises because of no support from UE vendors. We can remove the corresponding requirements in RAN4, but nothing is wrong in the existing UE capability srs-switchingTimeNR. |

### 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** |
| R4-2106611 | Company A |
| Company B |
|  |
| R4-2106930 | Nokia: Is the addition to the CR the same as the condition in following bullet? It seems current conditions for applicability is sufficient. Hence, we do not see a need for this CR.  - for UE, which does not support simultaneous reception and transmission for inter-band TDD CA specified in TS 38.331 [2], and is compliant to the requirements for inter-band CA with uplink in one NR band and without simultaneous Rx/Tx specified in TS 38.101 [5], the SRS transmission are not simultaneously scheduled with DL SSB/CSI-RS for L3 or L1 measurements transmission on other carriers. |
| 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 #1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 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** |
| R4-2106611 | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |
| R4-2106930 |  |

## Discussion on 2nd round (if applicable)

# Topic #2: SRS carrier switching requirements (Perf)

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2104899**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2104899.zip) | Qualcomm, Inc. | 38.133 CR on SRS test cases  Summary of change:  Update the SRS carrier switching test cases |
| [**R4-2106613**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2106613.zip) | vivo | Draft CR to 38.133 correction on SRS carrier based switching test cases  Summary of change:   * Changed SRS transimission from periodic to aperiodic * Corrected SRS configurations * Added missing test parameters |

## Open issues summary

Companies are encouraged to provide feedback directly for the two draft CRs.

## Companies views’ collection for 1st round

### 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** |
| [**R4-2104899**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2104899.zip) | Company A |
| Company B |
|  |
| [**R4-2106613**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2106613.zip) | Anritsu: Could you clarify the reason to change SRS transmission from periodic to aperiodic? If we see removed Table A.4.5.2.8.1-4 or associated reference table A.3.24-1, it seems resource type is defined as periodic. Anyway we would like to suggest merging contents with R4-2104899. |
| Company B |
|  |

## Summary for 1st 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** |
| [**R4-2104899**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2104899.zip) | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |
| [**R4-2106613**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2106613.zip) |  |

## 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”.*

# Topic #3: CGI reading requirements with autonomous gap (Perf)

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2104568**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2104568.zip) | MediaTek inc. | DraftCR on SA CGI identification of E-UTRA neighbor cell Test Case  Summary of change:  In R4-2017363 it is agreed to add 30ms LTE power up time for CGI reading delay of LTE target cell. Include the 30ms LTE power up time in this reporting delay. |
| [**R4-2104900**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2104900.zip) | Qualcomm, Inc. | CR: CGI reading TCs  Summary of change:  Update the CGI reading test cases |

## Open issues summary

Companies are encouraged to provide feedback directly for the two draft CRs.

## Companies views’ collection for 1st round

### 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** |
| [**R4-2104568**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2104568.zip) | Huawei: OK with the change, but some other test requirements need to be updated also, e.g. the highlighted ones:  The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.  ...   * The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170 ms at least the following number of ACK/NACK shall be detected as being transmitted by the UE.Config 1, 2, 4, 5: 80 ACK/NACK * Config 3, 6: 160 ACK/NACK   The rate of correct events observed during repeated tests shall be at least 90%.  NOTE: The overall ACK/NACK number is caused by two parts. Firstly, at least 60/120 ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement in Clause 9.4.7.1. Secondly, given that continuous DL data allocation, additional 20/40 ACK/NACK shall be sent from the start of T3 until 170 ms excludes 150 ms for identifying the cell global identifier of cell 2. |
| Company B |
|  |
| [**R4-2104900**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2104900.zip) | Huawei:  Change #1 is fine.  Change #2 is overlapping with 4568, and we prefer to define the interruption requirements in number of ACK/NACKs, as this is how core requirements are defined in 8.2.2.2.15.  Change #3 is fine, except that the clause number referred for interruption requirement should be 8.2.2.2.14. |
| Company B |
|  |

## Summary for 1st 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** |
| [**R4-2104568**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2104568.zip) | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |
| [**R4-2104900**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2104900.zip) |  |

## 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”.*

# Topic #4: Mandatory MG patterns (Perf)

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2104480**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2104480.zip) | ZTE Corporation | **Proposal 1: R15 test cases on mandatory gap patterns shall be inherited completely to R16 specifications, and R16 UEs shall pass all test cases.** |
| [**R4-2104862**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2104862.zip) | Apple | **Observation 1:** besides newly introduced tests configured with #2, #3 and #17, there are still quite a lot of existing test cases configured with “legacy” MG patterns.  **Observation 2:** if the UE can successfully pass the new test case configured new mandatory gap pattern, it can also survive the corresponding test case with “legacy” MG pattern.  **Proposal 1: For the scenario which is without SSB time index detection and when DRX is not used, the Rel-15 MG related test cases can be skipped if UE passes the Rel-16 new introduced MG related test cases for the same scenario. For other scenarios, no Rel-15 test cases can be skipped.** |
| [**R4-2104863**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2104863.zip) | Apple | CR for test applicability for mandatory gap patterns  Summary of change: Introduce test applicablity for test cases with different MG pattern to allow UE to skip some existing test cases if it can pass the new test cases. |
| [**R4-2104947**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2104947.zip) | CMCC | ***Proposal 1: from our point of view, we prefer option 2, but we are also fine with option 1 to move forward.*** |
| [**R4-2106886**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2106886.zip) | Ericsson | **Observation 1 :** The newly defined test cases for mandatory measurement gap take approximately 10 minutes each for FR1 and FR2 which is an extremely small part of the total UE RRM certification testing time  **Observation 2 :** It is not desirable to eliminate test coverage based on assumptions and pre-conceptions about likely failure modes in a very complicated implementation and system such as NR  **Observation 3 :** Test case lists are developed and maintained by many bodies and organisations within the industry who do not expect that test coverage will be removed in a future release  **Observation 4 :** The business incentive to develop and certify test implementation is less if they are only used for testing a single release of UE  **Proposal 1 : A release 16 UE is expected to pass tests with release 15 MG patterns, and additionally the tests defined in [1] and [2] for release 16 mandatory gap patterns. This corresponds to Option 2 in the WF.** |
| [**R4-2106931**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2106931.zip) | Huawei, HiSilicon | **Proposal: Introduce the limited number of test cases for R16 mandotory MG and no R15 test cases are skipped:**  **- SA: inter frequency measurement without SSB index detection and with no DRX (FR1 and FR2)**  **- ENDC: inter frequency measurement without SSB index detection and with no DRX (FR1 and FR2)**  **Where**   * + - **#3 for per-UE gap capable UE in FR1**     - **#2 for per-FR gap capable UE in FR1**     - **#17 in FR2** |

## 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 4-1 Allowing UEs to skip R15 TCs?

*Sub-topic description:*

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

**Issue 4-1: Whether to allow R16 UEs to skip some of R15 TCs**

* Proposals
  + Option 1: No (ZTE, CMCC, Ericsson, Huawei)
  + Option 2: Partly. For the scenario which is without SSB time index detection and when DRX is not used, the Rel-15 MG related test cases can be skipped if UE passes the Rel-16 new introduced MG related test cases for the same scenario. For other scenarios, no Rel-15 test cases can be skipped. (Apple, CMCC)
* Recommended WF
  + Discussion is needed

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Issue 4-1: |
| ZTE | Issue 4-1: Support Option 1. We do not see clear logic why R15 TCs shall be skipped since this is not the common practice. To safeguard the UE performance and then the overall network performance, we don’t think skipping TCs is a good idea. |
| Huawei | Issue 4-1: Support option1.  We understand the motivation of option 2 is to reduce test number, however this may have potential risk if some fundamental R15 test cases are untested. The event triggered reporting test without SSB time index and without DRX is one critical test to be verified. In R15, pattern #0 for per UE gap capable UE or pattern#4 for per FR gap capable UE is configured. As we know the MGL length of pattern #0 and pattern#2 is different. If only pattern#2 is verified by R16 UE, the performance of MG pattern #0 is not verified for the same scenario. |

### 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** |
| [**R4-2104863**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2104863.zip) | Huawei: depending on the conclusion of issue 4-1 |
| 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 #1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 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** |
| [**R4-2104863**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2104863.zip) | *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)

# Recommendations for Tdocs

## 1st round

**New tdocs**

|  |  |  |
| --- | --- | --- |
| **Title** | **Source** | **Comments** |
| WF on … | YYY |  |
| LS on … | ZZZ | To: RAN\_X; Cc: RAN\_Y |
|  |  |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2106611 | Draft CR to 38.133 correction on SRS carrier based switching core requirements | vivo, Qualcomm, Huawei, HiSilicon, MediaTek Inc., Apple, Nokia | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-2106930 | Correction on SRS carrier switching | Huawei, HiSilicon |  |  |
| [**R4-2104899**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2104899.zip) | CR: SRS carrier switching TCs | Qualcomm, Inc. |  |  |
| [**R4-2106613**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2106613.zip) | Draft CR to 38.133 correction on SRS carrier based switching test cases | vivo |  |  |
| [**R4-2104568**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2104568.zip) | DraftCR on SA CGI identification of E-UTRA neighbor cell Test Case | MediaTek inc. |  |  |
| [**R4-2104900**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2104900.zip) | CR: CGI reading TCs | Qualcomm, Inc. |  |  |
| [**R4-2104863**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2104863.zip) | CR for test applicability for mandatory gap patterns | Apple |  |  |

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 |  |
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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