**3GPP TSG-RAN WG4 Meeting # 111 R4-2408015**

[Fukuoka City,](https://www.3gpp.org/Specification-Groups/) Japan, 20 May – 24 May, 2024

**Agenda item:** 7.15.3

**Source:** Moderator (vivo)

**Title:** Topic summary for [111][218] NR\_DualTxRx\_MUSIM

**Document for:** Information

# Introduction and recommendations

*Briefly introduce background, the scope of this email discussion (e.g. list of treated agenda items) and provide some guidelines for email discussion if necessary.*

This document provides the summary of topic [111][218] NR\_DualTxRx\_MUSIM.

*List of candidate target of discussions for this topic.*

Recommendation topic to be discussed online in order of priority identified by the moderator.

**Issue 1-1-2: Scenarios for the case where the MO to be measured without MG have to be measured in the associated MG**

**Issue 1-1-1: Mandatory MUSIM gap patterns or constraints on MUSIM gap request from UE side**

**Issue 1-1-3: How to capture agreements on MUSIM and Type-1 collision handling when their MGRP is identical**

**Issue 1-1-5: Clarification on MUSIM related operations within allocated MUSIM gaps**

**Issue 1-1-4: Clarification on network schedule on dropped gaps**

# Topic #1: RRM core requirements maintenance for Rel-17 MUSIM gaps

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

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2407843**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407843.zip) | Xiaomi | **Proposal 1: No need to discuss further whether to introduce mandatory MUSIM gap patterns.**  **Proposal 2: Do not define constraints on MUSIM gap request from UE side.** |
| [**R4-2408157**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408157.zip) | Nokia | 1. Introduce 1 or 2 mandatory MUSIM gaps. 2. As minimum the UE shall support MUSIM gap with MGL=6ms and MGRP=80ms. 3. Capture in the MUSIM requirements section a new section 9.1.10.7 that no requirements apply if collisions occur between a MUSIM gap and any measurement gap without assigned priority if the two gaps collide and have the same MGRP. 4. Remove the ‘(activated)’ in section ‘Applicability of requirements for MUSIM gaps’. 5. Clarify in section 9.1.10 that the operations listed concerning cell detection, measurements, paging reception and SI reception are for MUSIM operations and shall be performed within the allocated MUSIM gaps. 6. Capture in section 9.1.10 that the network can schedule the UE in gaps (MUSIM and measurement gaps) which are dropped due to gap collision handling. 7. UE scheduling availability in dropped gaps shall be clarified covering both sections 9.1.10.4 and 9.1.10.5. 8. Clarify that the MUSIM requirements applies when UE is allocated one or more of the requested MUSIM gaps. 9. Support P1. If UE is configured to perform measurement without gap which partially overlap with measurement gaps but which measurement occasions outside measurement gaps are fully overlapping with the union of the measurement gaps and the allocated MUSIM gaps, the UE shall perform the measurements within the measurement gaps. 10. For P1-1 – apply same principle as for P1. 11. RAN4 need to discuss potential impact from UE autonomous MUSIM operation using a separate (MUSIM) receiver. 12. RAN4 to provide a clarification within Rel-18 regarding Rel-18 MUSIM operation using separate receiver. |
| [**R4-2408158**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408158.zip) | Nokia | CR |
| [**R4-2408319**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408319.zip) | Ericsson | ***Proposal 1: The UE which supports MUSIM feature shall support at least one MUSIM gap pattern within a subset of MUSIM gap patterns.***  ***Proposal 2: UE shall know the preferred MUSIM gap patterns from NW*** ***before UE requesting the MUSIM gaps.***  ***Proposal 3: When UE performs a measurement without gap which is partially overlapping with the MG but fully overlapping with the union of the NW-A’s gap and MUSIM gaps, UE shall perform the measurement within MG.*** |
| [**R4-2408623**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408623.zip) | vivo | **Observation 1: Introducing this mandatory gap will reduce the chance a UE request MUSIM several attempt since the requested MUSIM gaps in previous attempt were not supported by the network side, which benefits both UE and network side.**  **Proposal 1: For compromise, when UE requests more than one periodic MUSIM gaps, at least one MUSIM gap has a MGRP larger than x ms where x could be 1280.**  **Proposal 2: For the scenario when measurement gap and MUSIM gaps are configured, where intra/inter-frequency measurement is measured with no measurement gap however part of the SMTC occasions of this intra/inter-frequency measurement object are overlapped with the measurement gap and all its SMTC are overlapping with the union of measurement gap and MUSIM gaps. Clarify the measurement will be performed within measurement gap.**  **Proposal 3: For the scenario when concurrent gaps and MUSIM gaps are configured, where intra/inter-frequency measurement is measured with no measurement gap however part of the SMTC occasions of this intra/inter-frequency measurement object are overlapped with the associated measurement gap of concurrent gap and all its SMTC are overlapping with the union of concurrent gaps and MUSIM gaps. Clarify the measurement will be performed within the associated measurement gaps.**  **Proposal 4: For the scenario when concurrent gaps and MUSIM gaps are configured, where intra/inter-frequency measurement is measured with no measurement gap and this measurement object is not associated with any concurrent gap, no requirement applies when all its SMTC are overlapping with the union of concurrent gaps and MUSIM gaps.** |
| [**R4-2408709**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408709.zip) | vivo | CR |
| [**R4-2409281**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409281.zip) | Huawei, HiSilicon | **Proposal 1: RAN4 not to introduce mandatory MUSIM gap patterns, or define constraints on MUSIM gap request from UE side.**  **Proposal 2: The MO that can be measured without MG should be measured in the associated MG if the SMTC is fully overlapping with union of MUSIM gap and MG.** |
| [**R4-2409282**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409282.zip) | Huawei, HiSilicon, vivo, ZTE, MediaTek | CR |
| [**R4-2409688**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409688.zip) | ZTECorporation,Sanechips | **Observation 1: There is no enough time for RAN4 to discuss this issue without any agreement which maybe impacts the further discussion of the design of test cases.**  **Observation 2: The UE can indicate its preferred gap patterns but the NW has the power to decide to support or not.**  **Observation 3: The NW may support all possible MUSIM gaps but the large overhead will be existed at NW side.**  **Observation 4: The gap requested by UE will be different from NW supported.**  **Observation 5:**   * **Which/How to test the such many MUSIM gaps requested by UE?** * **How/Whether the TE vendor handles such MUSIM gap patterns if NW supports all possible MUSIM gaps?**   **Observation 6: How to avoid the interruption in NW A when UE performing related operations in NW B such as paging since the NW/TE will not allocate the MUSIM gaps to UEs.**  **Proposal 1: RAN4 shall introduce the mandatory MUSIM gap(s).**  **Proposal 2: The detailed option for mandatory MUSIM gap patterns shall refer to p2 and p4.** |
| [**R4-2409727**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409727.zip) | MediaTek inc. | **Proposal 1: No need to discuss further whether to introduce mandatory MUSIM gap patterns.** |
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## Open issues summary

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

### Sub-topic 1-1 RRM core requirements maintenance for Rel-17 MUSIM gaps

**Issue 1-1-1: Mandatory MUSIM gap patterns or constraints on MUSIM gap request from UE side**

* Proposals
  + P1: No need to introduce mandatory MUSIM gap patterns and constraints on MUSIM gap request from UE side (xiaomi Huawei MTK)
  + P2: Define 1 or 2 mandatory MUSIM gap patterns, as minimum the UE shall support MUSIM gap 6ms MGL and 160ms MGRP (Nokia ZTE)
  + P3: UE support at least one MUSIM gap pattern within a subset of MUSIM gap patterns and UE shall know the preferred MUSIM gap patterns from NW before UE requesting the MUSIM gaps.(Ericsson)
  + P4: For compromise, when UE requests more than one periodic MUSIM gaps, at least one MUSIM gap has a MGRP larger than x ms where x could be 1280 (vivo ZTE)
  + P5: Discuss whether an LS is needed to RAN5 confirming that RAN4 assumption is reasonable. (Nokia)

*Recommendations:*

**Issue 1-1-2: Scenarios for the case where the MO to be measured without MG have to be measured in the associated MG**

* Proposals
  + P1-1: When UE performs a measurement without gap which is partially overlapping with the MG but fully overlapping with the union of the NW-A’s gap and MUSIM gaps, UE shall perform the measurement within MG. (Ericsson Huawei Nokia)
  + P1-2: (vivo):
    - Case 1: For the scenario when measurement gap and MUSIM gaps are configured, where intra/inter-frequency measurement is measured with no measurement gap however part of the SMTC occasions of this intra/inter-frequency measurement object are overlapped with the measurement gap and all its SMTC are overlapping with the union of measurement gap and MUSIM gaps. Clarify the measurement will be performed within measurement gap.
    - Case 2: For the scenario when concurrent gaps and MUSIM gaps are configured, where intra/inter-frequency measurement is measured with no measurement gap however part of the SMTC occasions of this intra/inter-frequency measurement object are overlapped with the associated measurement gap of concurrent gap and all its SMTC are overlapping with the union of concurrent gaps and MUSIM gaps. Clarify the measurement will be performed within the associated measurement gaps.
    - Case 3: For the scenario when concurrent gaps and MUSIM gaps are configured, where intra/inter-frequency measurement is measured with no measurement gap and this measurement object is not associated with any concurrent gap, No requirement applies when all its SMTC are overlapping with the union of concurrent gaps and MUSIM gaps.

Recommendations:

To moderator’s understanding Case 1 plus case 2 in P1-2 is the same as P1-1.

The only extra case is:

When a MO measured without gap is not associated with any one of concurrent gap however all of its SMTC are overlapping with the union of concurrent and MUSIM gaps, no requirement applies under this scenario.

**Issue 1-1-3: How to capture agreements on MUSIM and Type-1 collision handling when their MGRP is identical**

* Proposals
  + P1: Capture in the MUSIM requirements section a new section 9.1.10.7 that no requirements apply if collisions occur between a MUSIM gap and any measurement gap without assigned priority if the two gaps in a collision have the same MGRP. (Nokia)

*Recommendations:*

*Suggest to capture the clarification in existing section instead of a new section*

**Issue 1-1-4: Clarification on network schedule on dropped gaps**

* Proposals
  + P1: Capture in section 9.1.10 that the network can schedule the UE in gaps (MUSIM and measurement gaps) which are dropped due to gap collision handling. UE scheduling availability in dropped gaps shall be clarified covering both sections 9.1.10.4 and 9.1.10.5 (Nokia)

*Recommendations:*

*Suggest to consider to capture the clarification*

**Issue 1-1-5: Clarification on MUSIM related operations within allocated MUSIM gaps**

* Proposals
  + P1: Clarify in section 9.1.10 that the operations listed concerning cell detection, measurements, paging reception and SI reception are for MUSIM operations and shall be performed within the allocated MUSIM gaps. (Nokia)

*Recommendations: Discuss during the meeting*

**Issue 1-1-6: Clarification on MUSIM requirements**

* Proposals
  + P1: Clarify that the MUSIM requirements applies when UE is allocated one or more of the requested MUSIM gaps. (Nokia)

*Recommendations:*

*Check whether the clarification is agreeable*

**Issue 1-1-7: UE Rel-18 MUSIM operation using separate receiver**

* Proposals
  + P1: RAN4 need to discuss potential impact from UE autonomous MUSIM operation using a separate (MUSIM) receiver. RAN4 to provide a clarification within Rel-18 regarding Rel-18 MUSIM operation using separate receiver (Nokia)

*Recommendations: Discuss during the meeting*

# Topic #2: RRM performance requirements

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

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2408320**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408320.zip) | Ericsson | Draft CR |
| [**R4-2409283**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409283.zip) | Huawei, HiSilicon | Draft CR |
| [**R4-2409690**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409690.zip) | ZTECorporation,Sanechips | Draft CR |
| [**R4-2409728**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409728.zip) | MediaTek inc. | Draft CR |
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# Topic #3: CR/Draft CR list

CRs for core part

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| **T-doc number** | **Title** | **Company** |
| [**R4-2408158**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408158.zip) | CR on collisions handling and MUSIM operations | Nokia |
| [**R4-2408709**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408709.zip) | Draft CR for applicable conditions for intra or inter-frequency measurement when MUSIM is configured | vivo |
| **[R4-2409282](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409282.zip)** | draftCR on RRM requirements for MUSIM gaps | Huawei, HiSilicon, vivo, ZTE, MediaTek |
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CRs for perf part

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| **T-doc number** | **Title** | **Company** |
| [**R4-2408320**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408320.zip) | Draft CR to 38.133 Test case of MUSIM TC4 | Ericsson |
| [**R4-2409283**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409283.zip) | draftCR on TC1 for MUSIM | Huawei, HiSilicon |
| [**R4-2409690**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409690.zip) | Draft CR for TC5 on MUSIM | ZTECorporation,Sanechips |
| [**R4-2409728**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409728.zip) | draftCR on TC2 for MUSIM | MediaTek inc. |