**3GPP TSG RAN meeting #99 RP-22xxxx**

**Rotterdam, Netherlands, March 20-23, 2023**

## Status Report to TSG

**Agenda item:** 9.3.2.3

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **WI / SI Name** |  | | | | |
| included in this status report | Study Item:  No | Core part:  Yes | Performance part:  Yes | | Testing part:  - |
| **Acronym** | NR\_DualTxRx\_MUSIM | | | | |
| **Unique ID** | 941001 | | | | |
| **TSG Tdoc of latest approved WI/SI description (if any)** | RP-223492 | | | | |
| **Target Completion Date**  **(indicate if changed)** | Study Item: - | Core part: 12/2023 | Performance part:  06/2024 | Testing part: - | |
| **Overall Completion level** | Study Item: - | Core part:  Overall: 30% | Performance Part: -  Overall: 0% | Testing part: - | |

Note: Overall completion level percentage numbers should use one of the colors below:

* xx%: Normal progress, no RAN plenary action needed
* xx%: Progress behind schedule, may need RAN plenary intervention. If so, SR should clearly define requested action
* xx%: Progress critically behind, RAN plenary shall intervene. SR should define requested action

**Source:**

|  |  |  |
| --- | --- | --- |
| **Leading WG** | | RAN2 |
| **Rapporteur** | **Name** | Xiaodong Yang |
| **Company** | vivo |
| **Email** | Yangxiaodong5g@vivo.com |

## 1 Work plan related evaluation

|  |  |
| --- | --- |
| **Do you want to modify the time budget for this WI/SI compared to what was endorsed at the last RAN meeting?** |  |

*If you answered No: Then please remove the Excel file from the zip file of this status report.*

*If you answered Yes: Then please fill out the attached Excel template to request a modification of the time budgets for your WI /SI. The Excel table has to be filled out for all affected RAN WGs and up to the target date of the WI/SI. The basis are the endorsed time budgets of the last RAN meeting. Please highlight all changes of the values.  
 One time unit (TU) corresponds to ~ 2 hours in the meeting.  
 If this status report covers a WI with Core and Performance part, then please have one line for each in the attached Excel table.  
 Note: If no Excel table is attached, then this means no time budget change.*

## 2. Detailed progress in RAN WGs since last TSG meeting (for all involved WGs)

NOTE: Agreements and Open issues impacted cross-TSG aspects shall be explicitly highlighted

## 2.1 RAN1

#### 2.1.1 Agreements

#### 2.1.2 Remaining Open issues

## 2.2 RAN2

#### 2.2.1 Agreements

**RAN2 121**

**Temporary capability restriction**

* **A2a: When the UE is in Connected mode in two NR networks, it is up to the UE implementation to select which NW to perform signaling for temporary UE capability restrictions.**
* **A2b: When the UE is in Connected mode in NR NW A and moving from Idle/Inactive to connected mode in NR NW B, the signaling for temporary UE capability restrictions can happen on NW A. FFS how to handle if UE is moving from IDLE/INACTIVE in NW A and is in CONNECTED with NW B.**
* **A2c: When the UE is in Connected mode in both networks and one is E-UTRAN, the signaling for temporary UE capability restrictions happens on the NR network.**
* **A3: The UE will request a temporary capability restrictions (e.g. via UAI) only after the NW signals via RRC that this is allowed. FFS whether the UE can indicate if it is already connecting with reduced capabilities during connection set-up/resume.**
* **A4: RAN2 to discuss whether prohibit timer is needed for the signaling of temporary UE capability restrictions This can wait until after progress is made on the signaling framework.**
* **A1: UAI can be used for the signaling of temporary UE capability changes for dual-active MUSIM. FFS if we have additional signalling (depends on e.g. SCell/SCG deactivation usability for MUSIM)**
* **A8: For dual-active MUSIM, at least the following type of UE capabilities can be expected to be impacted:**

**• Transmission and reception capabilities (e.g. MIMO layers)**

**• Measurement capabilities (e.g. gaps)**

**• Supported bandwidth**

**• Supported band-combinations (FFS whether this is CA or DC or both)**

* **FFS what is the granularity of reported temporary UE capability restrictions (also pending the band conflict discussion).**
* **FFS whether UE reports some or all of the above or whether we can do something simpler**
* **A6: For dual-active MUSIM, UE signaling will support the request for release (and reversal) of SCells and SCG. The signaling details (e.g. implicit or explicit request of each SCell or SCG) is FFS. FFS if we support deactivation (based on discussion in which case it can be used). It is up to network how to react to UE request.**
* **RAN2 does not intend to create new procedures for e.g. SCell/SCG deactivation for MUSIM purposes in Rel-18. Existing procedures can be used based on NW choice.**
* **B4: RAN2 considers the only RAN3 impact may be to support the UE request of SCG/SCell release via SRB3 (if supported) for MUSIM purpose (e.g. cause value). If this can be done via inter-node messages, RAN2 expects no RAN3 impacts.**
* **RAN2 confirms that the band conflict scenarios will be covered by the temporary UE capability restrictions. FFS on signalling details.**

**R17 MUSIM Gap coordination**

* **The UE is only allowed to provide MUSIM assistance information for Rel-17 MUSIM gap preference to NR MN and NR MN configures the UE with Re-17 MUSIM gap(s). This requires no specification impacts.**
* **Use inter-node messages to convey Rel-17 MUSIM gap configuration from MN to SN in NW A when UE is in NR-DC.**

#### 2.2.2 Remaining Open issues

1 Continue to discuss the scenarios and mechanism to indicate preference on temporary UE capability restriction in NW A when the UE needs transmission or reception for MUSIM purpose.

2 MUSIM Gap coordination and priority handling

## 2.3 RAN3

#### 2.3.1 Agreements

#### Remaining Open issues

## 2.4 RAN4

#### 2.4.1 Agreements

**RAN4 106**

**Issue 1-1-2: Considerations on one-shot RRM mobility procedures**

* Agreements:
  + No need to consider the collision between SMTC and MUSIM gaps for RRC Re-establishment, RRC Connection Release with Redirection
  + FFS on collision between SMTC and MUSIM gaps for handover and Scell activation

**Issue 2-1-1: On introduction of priority for MUSIM gaps**

* Agreements:
  + P1: The priority level of MUSIM shall be configured to be comparable to priority level of other MGs
  + MUSIM gap and Type-2 gap cannot be configured with the same priority
* Agreements
  + The priority level of MUSIM gaps should be configured/allocated by NW A

**Issue 2-1-2: Priority/usage indication on MUSIM gaps from UE side**

* Agreements:
  + Down-select from option 1 and option 2
    - Option 1: UE can indicate its preferred priority per each MUSIM gap
    - Option 2: UE indicates the MUSIM gap with the highest priority level and the MGRP should be larger or equal to a threshold
* Agreements
  + UE can optionally indicate its preferred priority for all or a subset MUSIM gaps
  + It is up to NW A on how to use this information

**Issue 2-3-1: Solutions for collision between MUSIM gap and Type-2 MG**

* Agreements:
  + Gap sharing will not be considered for the collision between MUSIM gaps and Type-2 gaps.

**Issue 4-1-1: Whether to** **define network B requirements**

* Agreements
  + Define NW B measurement/cell reselection requirements in IDLE mode only
    - Prioritize the scenario where
      * MUSIM gap is not colliding with other NW A gaps and not dropped
      * NW A configures MUSIM gaps requested by UE
    - FFS whether and how to define test cases for these requirements

#### 2.4.2 Remaining Open issues

1. Collisions between gaps and priority rules

2. On network A requirements

3. On network B requirements

## 3. Detailed progress in SA/CT WGs since last TSG meeting (for all involved WGs)

NOTE: This section only needs to be filled in for WI/SIs where there is a corresponding relevant WI/SI in SA/CT.

## 3.1 SAx/CTs

#### 3.1.1 Agreements with cross-TSG impacts

#### 3.1.2 Remaining Open issues with cross-TSG impacts

NOTE: This section should also flag any critical dependencies that need TSG attention.

## 4. RAN Plenary Intervention

## 5. References

NOTE: This can be e.g. a list of all related Tdocs in the affected WGs since last TSG, references to LSs, produced TRs/TSs, the work/study item description or status reports of previous TSGs.

**RAN2 #121**

R2-2300902 Work planning of R18 MUSIM vivo Work Plan Rel-18

R2-2300098 Scenarios Clarification for R18 MUSIM OPPO discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

R2-2300099 Initial Consideration on Temporary UE Capability Restriction OPPO discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

R2-2300435 Scenarios and requirements for capability restriction request for Rel-18 MUSIM Intel Corporation discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

R2-2300436 Signalling to indicate temporary capability reduction for Rel-18 MUSIM Intel Corporation discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

R2-2300496 Applicable scenarios for R18 MUSIM Huawei, HiSilicon discussion

R2-2300498 Solutions for MUSIM capability restriction removal of restriction Huawei, HiSilicon discussion

R2-2300753 Discussion on Temporary Capability Restriction for DualRx/DualTx MUSIM UEs Apple discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

R2-2300773 Report of [Post119bis-e][212][MUSIM] Rel-18 MUSIM solutions Qualcomm Incorporated, vivo report

R2-2300816 Discussion on temporary UE capability restriction for MUSIM MediaTek Inc. discussion

R2-2300855 RAN3 impact of temporary UE capability switching for MUSIM China Telecom discussion Rel-18 NR\_DualTxRx\_MUSIM

R2-2300903 Discussion on temporary capability restriction for Rel-18 Multi-SIM vivo discussion Rel-18

R2-2300922 Baseline signaling procedure for primary scenarios of Dual TX/RX MUSIM operation Nokia, Nokia Shanghai Bell discussion Rel-18

R2-2300923 Analysis on additional capability coordination scenarios for Dual TX/RX MUSIM operation Nokia, Nokia Shanghai Bell discussion Rel-18

R2-2300969 Consideration on dual Tx/Rx Multi-SIM Lenovo discussion Rel-18

R2-2301116 Capability sharing issue for SRS Tx switching capability Xiaomi discussion Rel-18 NR\_DualTxRx\_MUSIM-Core R2-2210060

R2-2301117 Discussion on the band conflicts for MUSIM Xiaomi discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

R2-2301173 UE Capability restriction for Dual-Active MUSIM China Telecommunications discussion Rel-18

R2-2301428 UE Capability Update for Dual-Active MUSIM Qualcomm Incorporated discussion

R2-2301448 Overall Dual-RX/TX MUSIM Solution Ericsson discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

R2-2301449 Discussion on MUSIM gaps for a Dual-RX/Dual-TX UE Ericsson discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

R2-2301543 Discussion on Dual Tx/Rx Multi-SIM ASUSTeK discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

R2-2301673 Capability Restriction for eMUSIM Sharp discussion

R2-2301709 Consideration on the Temporary Capability Restriction ZTE Corporation, Sanechips discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

R2-2301742 General Solution for Rel-18 MUSIM LG Electronics discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

R2-2301743 LS on SCG Deactivation while Multi-SIM Operation LG Electronics LS out Rel-18 NR\_DualTxRx\_MUSIM-Core To:RAN4

=> Withdrawn

R2-2301881 Discussion on possible solutions for dual Rx/Tx MUSIM devices DENSO CORPORATION discussion NR\_DualTxRx\_MUSIM-Core

R2-2300517 MUSIM Band Conflict Issue Handling Samsung R&D Institute India discussion Rel-18

R2-2300754 Discussion on Signaling solutions for Band Conflict Mitigation for DualRx/Dual Tx MUSIM UEs Apple discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

R2-2300904 Discussion on MUSIM band conflict handling vivo discussion Rel-18

R2-2301446 Coordination of MUSIM gaps for NR-DC Qualcomm Incorporated discussion

R2-2301710 Consideration on the Scheduling Gap for the MR-DC ZTE Corporation, Sanechips discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

R2-2301744 Further Considerations for Rel-18 MUSIM LG Electronics discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

R2-2301778 Further discussion on MN-SN MUSIM gaps coordination Samsung Electronics Austria discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

R2-2302008 Report of [Post121][202][MUSIM] LS to RAN4 on Rel-18 MUSIM impacts (vivo) vivo report

R2-2302007 LS to RAN4 on Rel-18 MUSIM impacts RAN2 LS out Rel-18 NR\_DualTxRx\_MUSIM-Core To:RAN4

**RAN4 #106**

R4-2300060 Discussion on priority rule of MUSIM Charter Communications, Inc Discussion

R4-2300233 On R18 MUSIM - collisions between gaps and priority rules Apple Discussion

R4-2300234 LS on MUSIM gap priority Apple Approval

R4-2300235 On R18 MUSIM - network A requirements Apple Discussion

R4-2300236 On R18 MUSIM - network B requirements Apple Discussion

R4-2300874 Discussion on collisions between gaps and priority rules for MUSIM gaps CMCC Discussion

R4-2300875 Discussion on open issues for MUSIM gaps CMCC Discussion

R4-2300876 Discussion on requirements for MUSIM gaps CMCC Discussion

R4-2300902 Discussion on collisions between gaps and priority rules for Rel-17 MUSIM gaps Xiaomi Discussion

R4-2300903 Discussion on network A requirements for Rel-17 MUSIM gaps Xiaomi Discussion

R4-2300904 Discussion on network B requirements for Rel-17 MUSIM gaps Xiaomi Discussion

R4-2300905 Discussion on other issues for Rel-17 MUSIM gaps Xiaomi Discussion

R4-2301284 Considerations on general aspects for MUSIM gaps vivo Discussion

R4-2301285 Considerations on collisions between gaps and priority rules for MUSIM gaps vivo Discussion

R4-2301286 Considerations on network A requirements for RRM requirements of MUSIM gaps vivo Discussion

R4-2301287 Considerations on network B requirements for RRM requirements of MUSIM gaps vivo Discussion

R4-2301288 Consideration on other issues for RRM requirements for R17 MUSIM gaps vivo Discussion

R4-2301289 LS on priority for MUSIM gaps vivo Approval

R4-2301384 Discussion on collision between gaps and priority rules ZTE Corporation Approval

R4-2301385 Discussion on neywork A requirements ZTE Corporation Approval

R4-2301386 Discussion on network Brequirements ZTE Corporation Approval

R4-2301643 Discussion on collision between gap and priority rules OPPO Approval

R4-2301644 Discussion on network A requirements OPPO Approval

R4-2301645 Discussion on network B requirements OPPO Approval

R4-2301646 Discussion on other aspects for MUSIM gaps OPPO Approval

R4-2301977 Discussion on collision handling for MUSIM gaps Huawei, HiSilicon Approval

R4-2301978 Discussion on NW-A requirements with MUSIM gaps Huawei, HiSilicon Discussion

R4-2301979 Discussion on NW-B requirements with MUSIM gaps Huawei, HiSilicon Discussion

R4-2301980 Discussion on other issues related to MUSIM gaps Huawei, HiSilicon Discussion

R4-2302113 Discussions on general issues in MUSIM gaps Ericsson Discussion

R4-2302114 Discussions on collision between MUSIM gaps Ericsson Discussion

R4-2302115 Discussions on NW-A’s requirement in MUSIM gaps Ericsson Discussion

R4-2302116 Discussions on NW-B’s requirement in MUSIM gaps Ericsson Discussion

R4-2302117 Discussions on other issues in MUSIM gaps Ericsson Discussion

R4-2302334 On requirements for Rel-17 MUSIM gaps Qualcomm Incorporated Approval

R4-2302356 Discussion on the general aspects of MUSIM gaps MediaTek inc. Discussion

R4-2302357 Discussion on RRM requirements for MUSIM gaps collision handling MediaTek inc. Discussion

R4-2302358 Discussion on NW A RRM requirements for MUSIM MediaTek inc. Discussion

R4-2302359 Discussion on NW B RRM requirements for MUSIM MediaTek inc. Discussion

R4-2302602 Discussion on Collisions between gaps and priority rules Nokia, Nokia Shanghai Bell Discussion

R4-2302603 Discussion on network A requirements Nokia, Nokia Shanghai Bell Discussion

R4-2302604 Discussion on network B requirements Nokia, Nokia Shanghai Bell Discussion

R4-2302605 Discussion on other aspects of MUSIM Nokia, Nokia Shanghai Bell Discussion

R4-2302782 Topic summary for [106][224] NR\_DualTxRx\_MUSIM Moderator (vivo) Information

R4-2303242 Ad-hoc minutes for NR Dual Tx/Rx Multi-SIM vivo Approval

R4-2303248 WF on NR Dual Tx/Rx Multi-SIM vivo Approval

R4-2303310 WF on NR Dual Tx/Rx Multi-SIM vivo Approval

R4-2301289 LS on priority for MUSIM gaps vivo Approval

R4-2303249 LS on priority for MUSIM gaps vivo Approval