3GPP TSG-RAN WG2 Meeting #121-bis electronic R2-2xxxxxx

April 17-26, 2023

Source: Session Chair (CATT)

Title: Report from NR MIMO evolution session

## Status of At-Meeting Email Discussions

This subclause is not an Agenda Item. It contains a running summary of the email discussions assigned to take place during the meeting weeks. This section will be moved to an appendix in the final version of the report.

[AT121bis-e][850] Organizational - MIMO evo (CATT)

Scope:

* Share plans for the meeting and list of ongoing email discussions
* Share meetings notes and agreements for review and endorsement

Intended outcome: General information sharing about the sessions

Deadline: EOM

## 7.20 NR MIMO evolution

(NR\_MIMO\_evo\_DL\_UL-Core; leading WG: RAN1; REL-18; WID: RP-223276)

Time budget: 0.5 TU

Tdoc Limitation: 2 tdoc

### 7.20.1 Organizational

Rapporteur input, incoming LS etc.

**Work plan**

R2-2302616 RAN2 work plan for MIMO evolution NTT DOCOMO, INC., Samsung, Huawei, HiSilicon Work Plan Rel-18

**LS in**

R2-2302455 LS to RAN2/4 on Agreements for Rel-18 MIMO (R1-2302226; contact: Samsung) RAN1 LS in Rel-18 NR\_MIMO\_evo\_DL\_UL To:RAN2, RAN4

### 7.20.2 Two TAs for multi-DCI multi-TRP

Includes discussion on whether to support per TRP UE-initiated RACH procedure, other RAN2 impacts of Two TAs for multi-DCI multi-TRP operation, etc.

**Per TRP UE-initiated RACH procedure**

R2-2302692 Discussion on multi-DCI multi-TRP with two TAs Intel Corporation discussion Rel-18 NR\_MIMO\_evo\_DL\_UL-Core

*Proposal 1: CBRA procedure is supported for per TRP UE-initiated RACH procedure in intra-cell case, at least for TA recovery.*

*Proposal 2: CBRA procedure is not supported for per TRP UE-initiated RACH procedure in inter-cell case.*

R2-2303016 Considerations on multi-DCI multi-TRP operation with two TAs Fujitsu discussion Rel-18 NR\_MIMO\_evo\_DL\_UL R2-2301035

*Proposal 3: For multi-DCI based Multi-TRP operation with two TAs, RAN2 to discuss if per TRP UE-initiated RACH procedure is needed.*

*Proposal 3bis: If per TRP UE-initiated RACH procedure is not supported, RAN2 to further discuss which TA timer is restarted when TAC is received in RAR.*

R2-2302879 Two TAs for multi-DCI multi-TRP Huawei, HiSilicon discussion Rel-18 NR\_MIMO\_evo\_DL\_UL-Core

*Proposal 1: In multi-DCI multi-TRP operation, for UL data arrival, the UE initiates CBRA on the serving PCI.*

*Proposal 2: In multi-DCI multi-TRP operation, parallel RACH on different TRPs is not supported.*

R2-2303560 Discussion on multi-DCI multi-TRP with two TAs Qualcomm Incorporated discussion NR\_MIMO\_evo\_DL\_UL-Core

*Proposal 3: From RAN2 perspective, no need to enhance CBRA procedure to support per TRP UE-initiated RACH procedure.*

**Other RAN2 impacts of 2 TAs**

R2-2303769 Discussion on two TAs for multi-DCI multi-TRP Samsung Research America discussion Rel-18 NR\_MIMO\_evo\_DL\_UL-Core

*Proposal 1: An additional TAG ID is configured for a serving cell.*

*Proposal 2: The maximum number of TAGs configured per MAC entity is increased to 8.*

*Proposal 3: Introduce a new TAC MAC CE if the maximum number of TAGs per MAC entity is increased.*

*Proposal 4: A MAC entity has up to 2 PTAGs with each PTAG using one TA for the SpCell.*

*Proposal 5: One TAT per TAG is configured and managed to support two TAs for mDCI mTRP.*

*Proposal 6: RAN2 to discuss UE behavior when only one TAT for a serving cell expires and when both TATs for a serving cell expire.*

*Proposal 7: For mDCI inter-cell mTRP, one separate RACH configuration is provided for each additional PCI for CFRA by PDCCH order.*

R2-2303690 On multi-DCI multi-TRP with two TAs Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_MIMO\_evo\_DL\_UL-Core

*Proposal 1: Utilize the existing TAG space (i.e., up to 4 TAGs) for multi-DCI multi-TRP purpose.*

*Proposal 2: Separate TATs are applied for the different TAGs for a serving cell (ie., same as legacy).*

*Proposal 3: Initial TA acquisition for the 2nd TAG is initiated by the network and performed through PDCCH order with CFRA procedure.*

*Proposal 4: Discuss how the RACH configuration to be used for TA acquisition for the 2nd TAG is pre-provisioned to the UE in inter-cell scenario.*

**Potential LS to R1**

R2-2303708 On 2TA operation Ericsson discussion Rel-18 NR\_MIMO\_evo\_DL\_UL-Core

*Proposal 1 RAN2 to send LS to RAN1 from RAN2#121bis to ask further clarification questions on the possible groupings and related operation.*

*Proposal 2 RAN2 to ask RAN1 more details on the needed RACH configuration per additional PCI. Wht exactly needs to be different per additional PCI.*

*Proposal 3 RAN2 to use the draft LS in appendix as baseline to formulate questions to RAN1*

R2-2302568 Discussion on multiple TAG OPPO discussion Rel-18 NR\_MIMO\_evo\_DL\_UL-Core

R2-2302939 Discussion on Multi-TRP with two TAs SHARP Corporation discussion NR\_MIMO\_evo\_DL\_UL-Core

R2-2302975 Discussion on two TAs for multi-TRP NEC Corporation discussion Rel-18 NR\_MIMO\_evo\_DL\_UL-Core

R2-2303022 Discussions on Two TAs for multi-DCI multi-TRP CATT discussion Rel-18 NR\_MIMO\_evo\_DL\_UL-Core

R2-2303248 Discussion on the impacts of Two TAs for multi-DCI multi-TRP operation Lenovo discussion Rel-18

R2-2303249 Discussion on the UE-initiated RACH procedure in multi-TRP operation Lenovo discussion Rel-18

R2-2303422 Support of Two TAs for multi-DCI multi-TRP Apple discussion Rel-18 NR\_MIMO\_evo\_DL\_UL-Core

R2-2303691 RA procedure while SpCell is configured with 2 TAGs Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_MIMO\_evo\_DL\_UL-Core

R2-2303732 UL time alignment in multi-DCI based multi-TRP with two TAs InterDigital discussion Rel-18 NR\_MIMO\_evo\_DL\_UL-Core

R2-2303757 Discussion on TA maintenance in two TAs for multi-TRP LG Electronics Inc. discussion Rel-18 NR\_MIMO\_evo\_DL\_UL-Core

R2-2304042 Discussion on two TAs for multi-TRP Xiaomi discussion Rel-18 NR\_MIMO\_evo\_DL\_UL-Core

R2-2304131 Intial Discussion On 2TA for unified TCI state based mPDCCH mTRP ZTE Corporation,Sanechips discussion Rel-18 NR\_MIMO\_evo\_DL\_UL-Core

R2-2304132 Considerations on the PDCCH order RACH for acquiring the TRP sepcific TA ZTE Corporation,Sanechips discussion Rel-18 NR\_MIMO\_evo\_DL\_UL-Core

### 7.20.3 Other

Other RAN2 impacts than those discussed in 7.20.1 and 7.20.2.

Note: This agenda item is with lower priority, i.e., it is treated only if time allows.

**Extension of uTCI framework**

R2-2302880 Extension of unified TCI framework for mTRP Huawei, HiSilicon discussion Rel-18 NR\_MIMO\_evo\_DL\_UL-Core

R2-2303023 Discussion on Unified TCI Framework Extension for Multi-TRP CATT discussion Rel-18 NR\_MIMO\_evo\_DL\_UL-Core

R2-2303064 MAC impacts on the enhancements of the unified TCI state framework Samsung discussion Rel-18 NR\_MIMO\_evo\_DL\_UL-Core

**Others**

R2-2303725 On incoming LSs on Rel-18 MIMO Ericsson discussion Rel-18 NR\_MIMO\_evo\_DL\_UL-Core

R2-2303758 Discussion on power control for multi-TRP LG Electronics Inc. discussion Rel-18 NR\_MIMO\_evo\_DL\_UL-Core

R2-2303939 Intra-UE prioritization for simultaneous multi-panel transmission ASUSTeK discussion Rel-18 NR\_MIMO\_evo\_DL\_UL-Core