3GPP TSG-RAN WG2 Meeting #123 DRAFT\_R2-2308967

Toulouse, France, August 21-25, 2023

Source: Session chair (Huawei)

Title: Report from MBS breakout session

# Offline discussions

Kicked-off together with a meeting start:

* [AT123][600] Organizational - MBS session

Scope:

* + - Share plans and list of ongoing email discussions for MBS sessions
    - Share meeting notes and agreements for review and endorsement

## 2.4 Instructions

Rel-18 CR Handling

- Current Plan: Rel-18 R2 Functional Freeze is Q4 2023, i.e. Rel-18 TSes need to be created at latest at this point in time.

- CRs for all Rel-18 WIs to be agreed at RAN2#124 (November 2023). Running Draft CRs need to be updated to be real CRs.

- Previously in-principle-agreed Rel-18 CRs (e.g. for TEI18 or WIs ending before November 2023) need to be updated towards the latest TS version and submitted for final CR agreement at RAN2#124 (CR editor / proponent need to do this).

- Such CRs do not need to be resubmitted to intermediate meetings before RAN2#124.

- Such CR may be superseded by revision due to correction, which is in-principle agreed (see bullet below). CR editor / proponent should be ready to handle such revisions.

- For WG meetings until functional freeze (including this) it is possible to maintain and revise Rel-18 CRs, also in-principle-agreed Rel-18 CRs, also for WIs with no TU budget (they are kept in the agenda for this purpose). It is better to fix issues now rather than wait for ASN.1 review.

- For revision proposals for Rel-18 CRs/DraftCRs, use TPs attached to discussion documents or DraftCRs (Includes current running Rel18 CRs or update of in-principle agreed Rel-18 CRs)

- CR editors / Rapporteurs are requested to continue even after close of their respective WIs to support maintenance related to their respective CR / WI.

Rel-18 RRC parameters and MAC CEs

- RRC parameters, including those requested by other groups, e.g. RAN1, are covered by WI-specific RRC CRs.

- MAC CE parameters, including those requested by other groups, e.g. RAN1, are covered by WI-specific MAC CRs

- For information see also R2-2306732, LS on Signalling alternatives, from R2#122.

Rel-18 UE capabilites

- Handling in RAN2 is expected similar to Rel-17.

- For information see also R2-2306810 Further Guidelines on UE capability definitions LS out, from R2#122.

Expected Outcomes

- EUTRA UE capabilities are covered in WI-specific CRs.

- NR UE capabilities are covered in Rel-18 common MegaCRs (38306 and 38331) covering all rel-18 WIs (end outcome).

- UE capabilities in LPP 37355 are covered in CR for the Positioning WI.

During the work on NR UE caps:

- In a Common Rel-18 Agenda Item (AI): RAN1 and RAN4 features are handled jointly under a common AI, with some explicit exceptions. Running UE cap MegaCRs are maintained for the parts handled in the common AI.

- In WI-specific Rel-18 Agenda Items: RAN2 features are handled per WI. Case-by-case, for selected WIs, RAN1 and RAN4 features handled specifically per WI. The outcomes are covered in WI-specific Running CRs (draft CRs). It is expected that WI-specific UE cap running CRs will be merged with the Running Mega CRs only at/after RAN2#124.

Tdoc limitations

Tdoc limitations doesn’t apply to Rapporteur Input, i.e.

- Assigned summary rapporteur input of the summary.

- Email / offline discussions outcomes by discussion rapporteur,

- WI rapporteurs input for WI planning etc,

- TS rapporteur input for TS maintenance.

- Contact Company of a LSin that triggers RAN2 action may submit one tdoc to facilitate the LS reply. This only applies to one of the contact companies in case there are several (default the first).

Tdoc limitations doesn’t apply to Input created at the meeting, revisions, assigned documents etc.

Tdoc limitations doesn’t apply to shadow / mirror CRs (Cat A), or In-Principle Agreed CRs.

Tdoc limitations applies to all other submitted tdocs (e.g. discussion tdoc and CR tdoc are counted as two).

## 7.11 Enhancements of NR Multicast and Broadcast Services

(NR\_MBS\_enh-Core; leading WG: RAN2; REL-18; WID: RP-221458)

Time budget: 0.75 TU

Tdoc Limitation: 3 tdocs

### 7.11.1 Organizational

LS in, rapporteur input, running CRs etc.

MBS UE capabilities CRs rapporteur is requested to provide an initial analysis of the required UE capabilities and identification of the related discussion points.

R2-2307015 Reply LS on multicast reception in RRC\_INACTIVE (R1-2306243; contact: Apple) RAN1 LS in Rel-18 NR\_MBS\_enh-Core To:RAN2

R2-2307112 Initial Consideration on UE Capability of eMBS vivo discussion Rel-18 NR\_MBS\_enh-Core

R2-2307492 RRC running CR for eMBS Huawei, HiSilicon draftCR Rel-18 38.331 17.5.0 B NR\_MBS\_enh-Core

### 7.11.2 Multicast reception in RRC\_INACTIVE

Objective: Specify support of multicast reception by UEs in RRC\_INACTIVE state [RAN2, RAN3], PTM configuration for UEs receiving multicast in RRC\_INACTIVE state [RAN2]. Study the impact of mobility and state transition for UEs receiving multicast in RRC\_INACTIVE. (Seamless/lossless mobility is not required) [RAN2, RAN3].

Papers should not be submitted to 7.11.2, please use 7.11.2.1 or 7.11.2.2 instead.

#### 7.11.2.1 Control plane

Including aspects such as:

- PTM configuration structure (exact parameters etc.)

- details of multicast MCCH configuration and MCCH handling by the UE

- service continuity during mobility and state transitions (e.g. access control for connection resume due to MBS, resume due to bad reception quality etc.)

- details of notifications/group paging enhancements due to session activation/deactivation/temporary no data

- details of frequency prioritization and multicast NCL

- UE capabilities

***Resume due to bad quality and new resume cause(s)***

R2-2308558 Connection resumption triggering for more reliable MBS reception InterDigital Inc. discussion Rel-18 NR\_MBS\_enh-Core

Proposal 1: RAN2 to discuss the following two options to trigger a connection resumption while an RRC\_INACTIVE UE has an active MBS session:

a) MCH BLER falls below a configured threshold

b) serving cell RSRP/RSRQ falls below a configured threshold

Proposal 2: Define a RRC resume cause value for indicating the UE is triggering the connection resumption due to reliability issues of MBS reception in RRC\_INACTIVE.

R2-2308200 PTM configuration and session deactivation LG Electronics Inc. discussion Rel-18

Proposal 1 If SIBx is not scheduled in SIB1, or if the PTM configuration is not available in serving cell, UE sets the resume cause to a new resume cause, such as multicast configuration.

Proposal 2 If the reception quality of the multicast is below the configured threshold, UE sets the resume cause to another new resume cause, such as multicast quality.

Proposal 3 If the RRC connection resume is initiated for multicast continuity (in three cases above), UE sets Access category to ‘2’ or ‘8’, depending on whether or not an emergency service is on-going.

Proposal 4 For an UE receiving multicast in RRC\_INACTIVE, the UE resumes the RRC connection when the measured RSRP or RSRQ of the serving cell becomes lower than the threshold configured by network.

Proposal 5 The threshold can be configured in PTM configuration, i.e., via RRCRelease or multicast MCCH message.

***Frequency prioritization***

R2-2307594 CP aspects for Multicast reception in RRC\_INACTIVE Samsung R&D Institute India discussion

Proposal 17: Dedicated frequency prioritization information for multicast reception in the RRC\_INACTIVE is provided to the UE through the RRCRelease with SuspendConfig.

Proposal 18: UE can be provided with the de-prioritization request for multicast in RRCRelease with suspendConfig to control RAN overload on specific frequency.

R2-2308109 Control plane aspects on multicast reception in RRC INACTIVE Kyocera discussion Rel-18 R2-2306147

Proposal 8 RAN2 should agree that the frequency information may be broadcasted by the gNB.

***Session deactivation***

R2-2308013 Control plane aspects of Multicast reception in RRC\_INACTIVE Lenovo discussion Rel-18

Proposal 1 For a deactivated session, the PTM configuration is optionally provided in RRCRelease message. A new deactivated state indication is provided in the PTM configuration to notify UE not to monitor the corresponding G-RNTI.

Proposal 2 For notification of deactivation of a MC session, either MRB release or MRB setup/modify can be used in MCCH. If MRB setup/modify is used, a new deactivated state indication is provided in the PTM configuration to notify UE stop monitoring the corresponding G-RNTI.

R2-2307263 Discussion on Control Plane for Multicast Reception in RRC\_INACTIVE CATT, CBN discussion Rel-18 NR\_MBS\_enh-Core

Proposal 1: Multicast MCCH should be present for a cell providing multicast reception in RRC\_INACTIVE.

Proposal 7a: UE determines the MBS session as active upon receiving the PTM configuration in RRCRelease if it has been configured to receive multicast in RRC\_CONNECTED state.

Proposal 7b: If the MBS session is not activated when receives PTM configuration in RRCRelease, UE does not perform MBS multicast reception in RRC\_INACTIVE immediately.

Proposal 7c: If the MBS session is not activated when UE receives PTM configuration in RRCRelease, it is assumed the PTM configuration does not change until session activation.

Proposal 7d: If the MBS session is not activated when UE receives PTM configuration in RRCRelease, UE directly uses the stored PTM configuration for multicast reception and starts to monitor MCCH DCI for change notification upon receiving group paging that indicates to allow the inactive multicast reception.

Proposal 7e: If UE did not receive PTM configuration in RRCRelease due to session deactivation, UE reads MCCH to acquire the PTM configuration upon receiving group paging that indicates to allow the inactive multicast reception.

Proposal 8: The session deactivation is indicated in the content of multicast MCCH.

***MBS + SDT***

R2-2308343 Multicast reception in RRC\_INACTIVE ZTE, Sanechips discussion Rel-18 NR\_MBS\_enh-Core

Proposal 8 It is possible a UE are both configured with SDT and MBS, no specific optimization shall be made in Rel-18.

Proposal 9 RRC\_INACTIVE UE monitors paging, regardless of whether SDT procedure is ongoing.

***MBS + eDRX/MICO***

R2-2308552 MBS multicast and UE power saving Ericsson discussion Rel-18 NR\_MBS\_enh-Core R2-2305917

Proposal 1: Clarify in 38.304 that when the UE is configured with eDRX or MICO mode, the UE monitors paging at the scheduled activation time as if eDRX or MICO mode was not configured.

Proposal 2: The UE monitors paging at the scheduled activation time for the duration of the configured CN PTW (when configured with eDRX) or Active Time (when configured with MICO mode).

R2-2307084 Control plane for multicast reception in RRC\_INACTIVE state TD Tech, Chengdu TD Tech discussion Rel-18

R2-2307085 MCCH change notification for multicast sessions in RRC\_INACTIVE state TD Tech, Chengdu TD Tech discussion Rel-18

R2-2307109 Discussion on eMBS from the CP Perspective vivo discussion Rel-18 NR\_MBS\_enh-Core

R2-2307135 Control plane discussion for multicast reception in RRC INACTIVE MediaTek inc. discussion Rel-18 NR\_MBS\_enh-Core

R2-2307155 Discussion on security issue with multicast MCCH CANON Research Centre France discussion Rel-18 NR\_MBS\_enh-Core

R2-2307412 Consideration on the control plane issue for multicast reception in RRC\_INACTIVE Beijing Xiaomi Software Tech discussion

R2-2307459 Discussion on control plane for Multicast reception in RRC\_INACTIVE NEC Corporation discussion NR\_MBS\_enh-Core

R2-2307493 CP issues for multicast reception for RRC INACTIVE UE Huawei, HiSilicon discussion Rel-18 NR\_MBS\_enh-Core

R2-2307638 Service continuity, RRC state transitions and notifications Qualcomm Incorporated discussion Rel-18 NR\_MBS\_enh-Core

R2-2307768 Control plane details for multicast reception in RRC\_INACTIVE state Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_MBS\_enh-Core

R2-2307779 RRC Resume for Multicast in RRC\_INACTIVE SHARP Corporation discussion R2-2306049

R2-2307843 Control plane aspects for multicast reception in RRC INACTIVE Apple discussion Rel-18 DUMMY

R2-2307895 Discussion on SDT and MBS multicast reception in RRC\_INACTIVE ITRI discussion NR\_MBS\_enh-Core

R2-2308133 Discussion on Service Continuity and RRC state transitions Spreadtrum Communications discussion Rel-18

R2-2308201 Multicast servic continuity LG Electronics Inc. discussion Rel-18

R2-2308304 Discussion on multicast reception in RRC\_INACTIVE CP issues CMCC discussion Rel-18 NR\_MBS\_enh-Core

R2-2308568 Ensuring desired level of reliability for an MBS session in RRC\_INACTIVE Interdigital Inc. discussion Rel-18 NR\_MBS\_enh-Core Withdrawn

R2-2308649 MCCH Monitoring and Configuration of UE with Multicast reception in RRC\_INACTIVE SHARP Corporation discussion

R2-2308652 Support of SDT and Multicast in RRC\_INACTIVE configured together SHARP Corporation discussion

R2-2308850 PTM configuration for eMBS Shanghai Jiao Tong University, NERCDTV discussion

R2-2308889 Multicast reception in RRC\_INACTIVE Ericsson discussion Rel-18 NR\_MBS\_enh-Core

#### 7.11.2.2 User plane

Including aspects such as:

- CFR configuration

- MAC operation (e.g. DRX, scheduling)

- L2 operation during state transitions and mobility (e.g. MRBs establishment/release etc.)

- further discussion on PHY layer impacts (considering the LS in from RAN1 in R1-2306243) etc.

***Connected mode MRBs handling***

R2-2307110 Discussion on eMBS from the UP Perspective vivo discussion Rel-18 NR\_MBS\_enh-Core

Proposal 1 NW indicates explicitly which on-going multicast service, e.g. in term of TMGI, can be received in INACTIVE in suspendConfig of RRC Release.

Proposal 2 If P1 is agreeable, UE behaviour is not to suspend corresponding multicast MRBs and to keep current CONNECTED MRB L2 configurations except for some MAC configuration, e.g. HARQ feedback, to continue this multicast service reception.

R2-2307264 Discussion on User Plane for Multicast reception in RRC\_INACTIVE CATT, CBN discussion Rel-18 NR\_MBS\_enh-Core

Proposal 4: When entering RRC\_INACTIVE state, UE suspends the existing MRBs used in CONNECTED state.

***PDCP COUNT handling***

R2-2308853 Discussion and draft TP on the PDCP operation for the support of multicast reception in RRC\_INACTIVE state Beijing Xiaomi Software Tech discussion Rel-18

Observation 2: PDCP count re-initialisation may cause data loss as the PDCP SDUs in the reception buffer will be discarded.

Proposal 3: Upon cell reselection, UE re-initializes the PDCP count of the MRB configured for the multicast reception in RRC\_INACTIVE state via the PDCP entity re-establishment.

Observation 3: It introduces extra signalling overhead and complexity to re-initialize the PDCP count via the RRC configuration.

Proposal 4: Upon cell reselection, UE sets the initial PDCP count of the MRB for the multicast reception in RRC\_INACTIVE state based on the same mechanism as R17 MBS broadcast.

R2-2307494 UP issues for multicast reception for RRC INACTIVE UE Huawei, HiSilicon discussion Rel-18 NR\_MBS\_enh-Core

Proposal 6: One cell can indicate "synchronized", if by implementation, it follows a common QoS flow to MRB mapping rule and at the same time PDCP COUNT is set according to the MBS QoS Flow SN.

Proposal 7: UE can regard two cells as synchronized if both indicate "synchronized". Otherwise, they are not synchronized.

***SPS support***

R2-2308594 Discussion on UP issues for Multicast in RRC Inactive LG Electronics Inc. discussion Rel-18 NR\_MBS\_enh-Core

Proposal 1. Support MBS SPS without HARQ feedback in RRC\_INACTIVE state.

Proposal 2. Support L1 SPS activation without HARQ feedback for MBS SPS in RRC\_INACTIVE.

Proposal 3. Support L1 SPS deactivation without HARQ feedback for MBS SPS in RRC\_INACTIVE.

Proposal 4. Introduce group paging for SPS release in RRC\_INACTIVE.

R2-2308305 Discussion on multicast reception in RRC\_INACTIVE UP issues CMCC discussion Rel-18 NR\_MBS\_enh-Core

Proposal 3: SPS is not supported for multicast reception in RRC\_INACTIVE.

***DRX handling***

R2-2307984 User plane aspects of multicast reception in RRC\_INACTIVE state Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_MBS\_enh-Core

Proposal 3: RAN2 enables RRC\_INACTIVE UE receiving multicast to also receive possible PTM retransmissions initiated by UEs receiving multicast in RRC\_CONNECTED.

Proposal 4: DRX for MBS multicast in RRC\_INACTIVE should be based on DRX for MBS multicast in RRC\_CONNECTED.

Proposal 5: Allow configuration of drx-HARQ-RTT-TimerDL-PTM and drx-RetransmissionTimerDL-PTM for INACTIVE UEs (38.331).

Proposal 8: UE receiving MBS multicast in RRC\_INACTIVE should start drx-HARQ-RTT-TimerDL-PTM and drx-RetransmissionTimerDL-PTM as specified in 38.321 when reception of the transport block has not been successful, but need not start drx-HARQ-RTT-TimerDL or drx-RetransmissionTimerDL.

R2-2307146 User plane aspects for eMBS NEC discussion NR\_MBS\_enh-Core

Proposal-4: the UE does not start drx-HARQ-RTT-TimerDL-PTM and drx-RetransmissionTimerDL-PTM for multicast reception during RRC\_INACTIVE.

***CFR restrictions***

R2-2307844 User plane aspects for multicast reception in RRC\_INACTIVE Apple discussion Rel-18 DUMMY

Proposal 1: Confirm that there is no restriction on the multicast CFR in RRC\_INACTIVE and the broadcast CFR configuration in the same cell.

Proposal 2: Confirm that the multicast CFR configuration in RRC\_CONNECTED and in RRC\_INACTIVE state can be same or different, and it’s up to network implementation.

R2-2307639 Further views on multicast CFR configuration aspects Qualcomm Incorporated discussion Rel-18 NR\_MBS\_enh-Core

Proposal 1. When Multicast CFR for RRC\_INACTIVE and broadcast CFR are configured differently, one of the two CFRs is fully contained (or overlapping) with the other CFR.

Proposal 2. If multicast CFR for RRC\_INACTIVE is not configured, the default is same as CORESET#0.

R2-2307086 User plane for multicast reception in RRC\_INCTIVE stat TD Tech, Chengdu TD Tech discussion Rel-18 Withdrawn

R2-2307136 L2 operation during state transitions and mobility for R18 multicast MediaTek inc. discussion Rel-18 NR\_MBS\_enh-Core

R2-2307148 User plane for multicast reception in RRC\_INCTIVE state TD Tech, Chengdu TD Tech discussion Rel-18

R2-2307758 UP Aspects for Multicast Reception in RRC\_INACTIVE Samsung discussion Rel-18 NR\_MBS\_enh-Core

R2-2308014 User plane aspects of Multicast reception in RRC\_INACTIVE Lenovo discussion Rel-18

R2-2308344 CFR design for Multicast reception in RRC\_INACTIVE ZTE, Sanechips discussion Rel-18 NR\_MBS\_enh-Core R2-2305663

R2-2308535 MBS remaining issues on DRX Ericsson discussion Rel-18 NR\_MBS\_enh-Core

### 7.11.3 Shared processing for MBS broadcast and Unicast reception

Objective: Specify Uu signalling enhancements to allow a UE to use shared processing for MBS broadcast and unicast reception, i.e., ‎including UE capability and related assistance information reporting regarding simultaneous unicast reception in RRC\_CONNECTED and MBS broadcast reception from the same or different operators [RAN2]

Including aspects such as:

- what exact parameters should be reported

- whether/how to address the case where additional information cannot be read by the UE from the non-serving cell

- whether any special handling is needed when the non-serving cell updates the configuration which is relevant for MII

R2-2307640 Shared processing for MBS broadcast and Unicast reception Qualcomm Incorporated discussion Rel-18 NR\_MBS\_enh-Core

Proposal 1. In case additional information (SCS, bandwidth) is not available at the time of sending the MII to the unicast serving cell (e.g. the UE is not able to read SIB1 from the non-serving cell), the UE reports whatever is available information at that time (i.e. at least the frequency, and optionally SCS and/or BW as available). UE reports updated MII after acquiring additional information from the non-serving cell.

Proposal 2. In case the non-serving cell updates its configurations relevant to the MII already sent by UE to the unicast serving cell, UE reports updated MII after acquiring the updated information from the non-serving cell. No additional special handling is needed.

R2-2307111 Further Discussion on Shared Processing in eMBS vivo discussion Rel-18 NR\_MBS\_enh-Core

Proposal 1 The SCS in the MII is set to the SCS of the initial BWP for the MBS broadcast cell.

Proposal 2 Frequency domain location and bandwidth information in the MII can be set based on configuration in CFR-ConfigMCCH-MTCH of the MBS broadcast cell’s SIB20 or the separate CFR for RedCap UE, as well as some additional information to derive the absolute value, e.g. absoluteFrequencyPointA and offsetToCarrier.

R2-2307265 Remaining Issues on Shared Processing CATT, CBN discussion Rel-18 NR\_MBS\_enh-Core

R2-2307460 Discussion on shared process for MBS broadcast and unicast NEC Corporation discussion NR\_MBS\_enh-Core

R2-2307495 Discussion on shared processing for MBS broadcast and unicast reception Huawei, HiSilicon discussion Rel-18 NR\_MBS\_enh-Core

R2-2307596 Rel-18 MII Enhancements Samsung R&D Institute India discussion

R2-2307675 Discussion on the reporting signaling for shared MBS capability Xiaomi discussion Rel-18 NR\_MBS\_enh-Core

R2-2308306 Discussion on shared processing CMCC discussion Rel-18 NR\_MBS\_enh-Core

R2-2308345 Non-serving cell configuration update in case of shared processing ZTE, Sanechips discussion Rel-18 NR\_MBS\_enh-Core

R2-2308744 Additional scenarios for shared processing Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_MBS\_enh-Core