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
* [AT123][601][eMBS] Frequency and bandwidth signalling (QCM)

Scope: Discuss with companies to achieve a common understanding on frequency and bandwidth signalling for MII for shared processing

Deadline: Report available for Friday CB session

## 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- Such CR may be superseded by revision due to correction, which is in-principle agreed (see bullet below).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](file:///C:\Users\Dwx974486\Documents\3GPP\TSGR2\TSGR2_122\Docs\R2-2306810.zip) 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](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307015_R1-2306243.docx) Reply LS on multicast reception in RRC\_INACTIVE (R1-2306243; contact: Apple) RAN1 LS in Rel-18 NR\_MBS\_enh-Core To:RAN2

* Will be considered in UP discussion
* There are some issues which RAN1 is still discussing so an update can be expected
* Noted

[R2-2307112](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307112%20Initial%20Consideration%20on%20UE%20Capability%20of%20eMBS.docx) Initial Consideration on UE Capability of eMBS vivo discussion Rel-18 NR\_MBS\_enh-Core

* Companies to consider these initial considerations in their future contributions
* Noted

[R2-2307492](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307492%20RRC%20Running%20CR%20for%20eMBS.docx) RRC running CR for eMBS Huawei, HiSilicon draftCR Rel-18 38.331 17.5.0 B NR\_MBS\_enh-Core

* Just an update to the latest RRC version
* The existing text can be modified based on the new agreements
* Noted

- Nokia thinks there is a field description change

- Huawei thinks this was an editorial error. It can be checked offline or with the next update

- Nokia indicates a couple of points need to be discussed, like terminology

- QCM indicates some paragraphs were not agreed yet, so we can still revisit

### 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)***

[R2-2308200](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2308200%20Multicast%20servic%20continuity.docx) 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.

DISCUSSION on quality thresholds:

* Nokia thinks some quality threshold would be more appropriate (i.e. BLER). P5 is OK, we should be able to set different thresholds for different services.
* NEC prefers to use RSRP/RSRQ as it is sufficient and does not require new requirements on the UE.
* ZTE prefers BLER and BLER is already defined for LTE, we could reuse this definition.
* Samsung agrees with P4 (RSRP/RSRQ), but we need to make sure the bad conditions last for some time. Lenovo shares this view, i.e. we need parameters ensuring there is no ping-pong.
* CATT thinks RSRP/RSRQ is sufficient, don’t want new requirements or definitions.
* QCM would like to avoid additional requirements on the UE. QCM supports a simple solution, i.e. just a threshold per session.
* Apple supports RSRP/RSRQ and would lie to reuse existing measurements/requirements.
* MTK agrees with using RSRP/RSRQ but thinks TTT may be needed.
* Huawei suggest we can reuse current measurement events.
* Nokia thinks RSRP/RSRQ does not work as it fluctuates too much.
* AT&T thinks we need to ensure the service stability and that there are not too many state transitions.
* Xiaomi wonders if RSRP/RSRQ is beam level or cell level?
* Ericsson supports a simple solution and supports RSRP/RSRQ.
* For a UE receiving multicast in RRC\_INACTIVE, the UE resumes the RRC connection when the measured RSRP or RSRQ based on the existing measurement requirements (whichever is configured by the NW) of the serving cell becomes lower than the threshold configured by network. FFS whether/how we need to address ping-pong issue
* The threshold can be configured in PTM configuration per MBS session via RRCRelease or multicast MCCH message.

DISCUSSION on resume causes:

***Frequency prioritization***

[R2-2307594](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307594%20CP%20aspects%20for%20Multicast%20reception%20in%20RRC_INACTIVE.docx) 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](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2308109_eMBS_multicast-inactive-CP.doc) Control plane aspects on multicast reception in RRC INACTIVE Kyocera discussion Rel-18 [R2-2306147](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2306147_eMBS_multicast-inactive-CP.doc)

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

DISCUSSION:

***Session deactivation***

[R2-2308013](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2308013%20MBS_CP.docx) 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.

DISCUSSION:

[R2-2307263](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307263%20Discussion%20on%20Control%20Plane%20for%20Multicast%20Reception%20in%20RRC_INACTIVE.docx) 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.

DISCUSSION:

***MBS + SDT***

[R2-2308343](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2308343%20Multicast%20reception%20in%20RRC_INACTIVE.doc) 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](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2308552%20MBS%20multicast%20and%20UE%20power%20saving.docx) MBS multicast and UE power saving Ericsson discussion Rel-18 NR\_MBS\_enh-Core [R2-2305917](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2305917%20MBS%20multicast%20and%20UE%20power%20saving.docx)

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).

[R2-2308558](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2308558_Connection%20resumption%20triggering%20for%20more%20reliable%20MBS%20reception.doc) Connection resumption triggering for more reliable MBS reception InterDigital Inc. discussion Rel-18 NR\_MBS\_enh-Core

[R2-2307084](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307084%20Control%20plane%20for%20multicast%20reception%20in%20RRC_INACTIVE%20state%2020230807.docx) Control plane for multicast reception in RRC\_INACTIVE state TD Tech, Chengdu TD Tech discussion Rel-18

[R2-2307085](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307085%20MCCH%20change%20notification%20for%20multicast%20session%20in%20RRC_INACTIVE%20state%2020230807.docx) MCCH change notification for multicast sessions in RRC\_INACTIVE state TD Tech, Chengdu TD Tech discussion Rel-18

[R2-2307109](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307109%20Discussion%20on%20eMBS%20from%20the%20CP%20Perspective.doc) Discussion on eMBS from the CP Perspective vivo discussion Rel-18 NR\_MBS\_enh-Core

[R2-2307135](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307135%20Control%20plane%20discussion%20for%20multicast%20reception%20in%20RRC%20INACTIVE.docx) Control plane discussion for multicast reception in RRC INACTIVE MediaTek inc. discussion Rel-18 NR\_MBS\_enh-Core

[R2-2307155](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307155%20security%20issue%20with%20mulitcast%20MCCH.docx) Discussion on security issue with multicast MCCH CANON Research Centre France discussion Rel-18 NR\_MBS\_enh-Core

[R2-2307412](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307412%20Consideration%20on%20the%20control%20plane%20issue%20for%20multicast%20reception%20in%20RRC_INACTIVE.docx) Consideration on the control plane issue for multicast reception in RRC\_INACTIVE Beijing Xiaomi Software Tech discussion

[R2-2307459](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307459%20Discussion%20on%20control%20plane%20for%20Multicast%20reception%20in%20RRC_INACTIVE.docx) Discussion on control plane for Multicast reception in RRC\_INACTIVE NEC Corporation discussion NR\_MBS\_enh-Core

[R2-2307493](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307493%20CP%20issues%20for%20multicast%20reception%20for%20RRC%20INACTIVE%20UE.docx) CP issues for multicast reception for RRC INACTIVE UE Huawei, HiSilicon discussion Rel-18 NR\_MBS\_enh-Core

[R2-2307638](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307638%20notif&state-transitions-rrc-inactive.docx) Service continuity, RRC state transitions and notifications Qualcomm Incorporated discussion Rel-18 NR\_MBS\_enh-Core

[R2-2307768](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307768%20Control%20plane%20details%20for%20multicast%20reception%20in%20RRC_INACTIVE%20state_final.docx) Control plane details for multicast reception in RRC\_INACTIVE state Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_MBS\_enh-Core

[R2-2307779](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307779%20RRC%20Resume%20for%20Multicast%20in%20RRC_INACTIVE.docx) RRC Resume for Multicast in RRC\_INACTIVE SHARP Corporation discussion [R2-2306049](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2306049%20RRC%20Resume%20for%20Multicast%20in%20RRC_INACTIVE.docx)

[R2-2307843](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307843_CP%20issues%20on%20multicast%20reception%20in%20RRC_INACTIVE_v0.doc) Control plane aspects for multicast reception in RRC INACTIVE Apple discussion Rel-18 DUMMY

[R2-2307895](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307895.docx) Discussion on SDT and MBS multicast reception in RRC\_INACTIVE ITRI discussion NR\_MBS\_enh-Core

[R2-2308133](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2308133.doc) Discussion on Service Continuity and RRC state transitions Spreadtrum Communications discussion Rel-18

[R2-2308201](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2308201%20PTM%20configuration%20and%20session%20deactivation.docx) Multicast servic continuity LG Electronics Inc. discussion Rel-18

[R2-2308304](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2308304%20Discussion%20on%20multicast%20reception%20in%20RRC_INACTIVE%20CP%20issues.docx) 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](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2308649%20MCCH%20Monitoring%20and%20Configuration%20of%20UE%20with%20Multicast%20reception%20in%20RRC_INACTIVE.docx) MCCH Monitoring and Configuration of UE with Multicast reception in RRC\_INACTIVE SHARP Corporation discussion

[R2-2308652](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2308652%20Support%20of%20SDT%20and%20Multicast%20in%20RRC_INACTIVE%20configured%20together.docx) Support of SDT and Multicast in RRC\_INACTIVE configured together SHARP Corporation discussion

[R2-2308850](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2308850%20PTM%20configuration%20for%20eMBS.docx) PTM configuration for eMBS Shanghai Jiao Tong University, NERCDTV discussion

[R2-2308889](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2308889%20Multicast%20reception%20in%20RRC_INACTIVE.docx) 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](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307110%20Discussion%20on%20eMBS%20from%20the%20UP%20Perspective.docx) 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](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307264%20Discussion%20on%20User%20Plane%20for%20Multicast%20reception%20in%20RRC_INACTIVE.docx) 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.

DISCUSSION:

* NEC shares a view with CATT as MRB configuration for INACTIVE is different than the one in CONNECTED.
* LGE thinks existing MRBs can be reused and asks whether CATT proposal is to establish new MRBs. CATT confirms. LGE what happens when UE goes back to CONNECTED. CATT clarifies UE releases INACTIVE MRBs and resumes CONNECTED MRBs as per legacy behavior.
* Lenovo wonders if PDCP variables can be continued with CATT proposal.
* ZTE thinks CATT’s solution is cleaner and thinks there are too many issues with the other approach in case we would try to achieve service continuity.
* Huawei thinks variables continuity can be achieved by NW implementation.
* Nokia supports P1/P2 from vivo.
* CMCC would prefer to have service continuity as some services may require this.
* MTK thinks we can reuse the MRBs and does not understand negative impacts of not suspending the MRBs.
* Samsung thinks there will be cases where the resources are different for INACTIVE than CONNECTED.
* Ericsson, QCM supports vivo’s proposal.
* QCM indicates that CATT’s proposal would require new procedures and potentially new capabilities.
* Apple supports MRB level continuity and indicates we need to modify the configuration a bit.
* ZTE does not believe we need to optimize for this specific case.
* NW indicates which multicast service can be received in INACTIVE in suspendConfig of RRC Release. FFS how exactly this is indicated
* Unless blocking issues are identified, UE behaviour is not to suspend corresponding multicast MRBs and to keep using them in INACTIVE

***PDCP COUNT handling***

[R2-2308853](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2308853%20Discussion%20and%20draft%20TP%20on%20the%20PDCP%20operation%20for%20the%20support%20of%20multicast%20reception%20in%20RRC_INACTIVE%20state.docx) 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](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307494%20UP%20issues%20for%20multicast%20reception%20for%20RRC%20INACTIVE%20UE.docx) UP issues for multicast reception for RRC INACTIVE UE Huawei, HiSilicon discussion Rel-18 NR\_MBS\_enh-Core

Proposal 5: The UE re-initializes the PDCP window similarly as for broadcast, if the source and the target cells are not synchronized.

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.

DISCUSSION:

* Lenovo supports Huawei proposal as it is very simple, i.e. with 1-bit indication.
* Nokia agrees we should support PDCP COUNT continuity, but we need LCID to MRB mapping at the UE. Thinks Huawei approach is not sufficient. Samsung agrees with Nokia. Samsung indicates the configuration of MRBs need to be the same. LGE shares Nokia view as well. LGE thinks gNB needs to pre-configure some information at the UE, e.g. a list of synced cells.
* ZTE does not think achieving synchronicity is not that simple and 1 bit will be not enough, thinks we need to provide COUNT in MCCH, but COUNT changes dynamically. ZTE prefers to follow spirit of MBS BC, i.e. no synchronization.
* Huawei does not see any impact to RAN3, what we have in Rel-17 is already sufficient. There is no need for COUNT. Lenovo, CMCC have the same understanding.
* CMCC thinks that we can use a bitmap to indicate synchronized cells.
* Ericsson thinks we could assume they are synced within an RNA.
* For “non-synchronised“ cell (in terms of PDCP COUNT), 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.
* 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.
* FFS how the UE is indicated about cells being synchronized (i.e. what information the NW needs to provide to the UE)
* Solutions which require COUNT broadcasting via MCCH are not considered

***SPS support***

[R2-2308594](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2308594%20Discussion%20on%20UP%20issues%20for%20Multicast%20in%20RRC%20Inactive.docx) 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](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2308305%20Discussion%20on%20multicast%20reception%20in%20RRC_INACTIVE%20UP%20issues.docx) 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.

DISCUSSION:

* Vivo does not support to have SPS and UE has no TCI state. There would be RAN1 impacts which we should avoid. Apple, ZTE agrees with vivo understanding.
* QCM thinks lack f HARQ feedback is a big issue for supporting SPS, so we can just leave it out. Ericsson agrees and indicates additional issues is the timing of activation/deactivation. It would be a new SPS mechanism.
* Samsung does not think reliability of activation is not a problem, it is similar as for dynamic scheduling. SPS is more reliable actually. Samsung indicates in CONNECTED we can use SPS so INACTIVE should also support it. Nokia agrees with Samsung.
* CMCC indicates that activation for SPS always requires HARQ feedback , even if SPS itself does not.
* CATT prefers not to support SPS in INACTIVE. Mobility case is an issue.
* Huawei thinks that mobility is the most challenging one, how can we ensure incoming UEs get SPS activation?
* LGE thinks mobility/reliability can be solved by repetition.
* QCM underlines that feedback is needed for activation and it would be a new type of SPS.
* SPS is not supported for multicast reception in RRC\_INACTIVE.

***DRX handling***

[R2-2307984](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307984%20User%20plane%20details%20for%20multicast%20reception%20in%20RRC_INACTIVE%20state.docx) 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](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307146%20UP%20issues%20for%20multicast%20in%20RRC%20Inactive.docx) 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](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307844_UP%20issues%20on%20multicast%20reception%20in%20RRC_INACTIVE_v0.doc) 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](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307639%20cfr-config-rrc-inactive.docx) 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](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307136%20L2%20operation%20during%20state%20transitions%20and%20mobility%20for%20R18%20multicast.docx) L2 operation during state transitions and mobility for R18 multicast MediaTek inc. discussion Rel-18 NR\_MBS\_enh-Core

[R2-2307148](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307148%20User%20plane%20for%20multicast%20reception%20in%20RRC_INACTIVE%20state%2020230807.docx) User plane for multicast reception in RRC\_INCTIVE state TD Tech, Chengdu TD Tech discussion Rel-18

[R2-2307758](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307758%20UP%20aspects%20for%20multicast%20reception%20in%20RRC_INACTIVE.docx) UP Aspects for Multicast Reception in RRC\_INACTIVE Samsung discussion Rel-18 NR\_MBS\_enh-Core

[R2-2308014](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2308014%20MBS_UP.docx) User plane aspects of Multicast reception in RRC\_INACTIVE Lenovo discussion Rel-18

[R2-2308344](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2308344%20CFR%20design%20for%20Multicast%20reception%20in%20RRC_INACTIVE.doc) CFR design for Multicast reception in RRC\_INACTIVE ZTE, Sanechips discussion Rel-18 NR\_MBS\_enh-Core [R2-2305663](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2305663%20CFR%20design%20for%20Multicast%20reception%20in%20RRC_INACTIVE.doc)

[R2-2308535](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2308535%20MBS%20remaining%20issues%20on%20DRX.docx) 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](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307640%20MBS-capability-sharing.docx) 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.

DISCUSSION:

* Xiaomi should not indicate the frequency based on SIB21, but based on SIB20 as the frequency in SIB21 is not CFR frequency.
* QCM thinks this is a good point but UE can also get this information via USD (e.g. in case the service is not yet ongoing).
* Vivo thinks we can discuss frequency reporting details based on the next paper and we just focus on P1 essence. Vivo thinks this information can be available based on UE implementation.
* Huawei thinks this cannot be solved by implementation as there may be cases where this info is not available. If the network knows UE’s interest, it can help the UE.
* CATT thinks P1 is agreeable.
* NEC thinks the solution is simple with small spec impact, so they support P1.
* ZTE asks why UE reports MII if it does not have an information. ZTE thinks the reported information in Rel-18 will be different than in Rel-17 (for this case).
* Xiaomi thinks the P1 is acceptable if that is majority view.
* Ericsson note these are two agreements actually, thinks that we could not report at all until the UE has full info or alternatively just report frequency and not update the information. QCM thinks this would go against the previous agreement.
* CATT think we can add it is up to NW implementation how to use the frequency.
* As per the previous agreement, if the UE is able to get the additional information (i.e. its current configuration does not prevent it from doing so), the UE shall do this (if capable and configured by the network)
* 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).

DISCUSSION on update of the info (P2):

* ZTE is concerned with updating the information by many UEs. QCM indicates we have already discussed this and decided not to have additional control.
* Ericsson thinks we need to have an update at least for the non-full info case.
* Huawei agrees with Ericsson and QCM. It is important to update the information if it changes. Nokia agrees with the proposal, no need to over-specify.
* UE reports updated MII after acquiring additional information from the non-serving cell (if previously it reported only frequency) or if the information in the non-serving cell changes.

[R2-2307111](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307111%20Further%20Discussion%20on%20Shared%20Processing%20in%20eMBS.docx) 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.

DISCUSSION on SCS:

* ZTE indicates SCS should be that of CORESET#0. Vivo indicates these are the same according to RAN1 spec.
* Xiaomi wonders about the RedCap case where Redcap BWP does not cover CORESET#0. ZTE thinks this cannot happen if the Recap UE is to receive MBS BC.
* The SCS in the MII is set to the SCS of the CORESET#0 for the MBS broadcast cell.

DISCUSSION on frequency and bandwidth:

* Xiaomi agrees with the first part of the agreement but no need for additional info.
* QCM wonders if we need both CFR BW and channel BW.
* Huawei thinks UE cannot always acquire CFR frequency. Huawei thinks this should be frequency.
* Chair: It seems companies need more time to check the details of what needs to be reported.
* QCM indicates R2-2208885 should be referred to check what frequency in NR means (answer 1). Thinks the only remaining part is BW.
* Offline 601 (QCM)

[R2-2307265](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307265%20Remaining%20Issues%20on%20Shared%20Processing.docx) Remaining Issues on Shared Processing CATT, CBN discussion Rel-18 NR\_MBS\_enh-Core

[R2-2307460](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307460%20Discussion%20on%20shared%20process%20for%20MBS%20broadcast%20and%20unicast.docx) Discussion on shared process for MBS broadcast and unicast NEC Corporation discussion NR\_MBS\_enh-Core

[R2-2307495](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307495%20Discussion%20on%20shared%20processing%20for%20MBS%20broadcast%20and%20unicast%20reception.docx) Discussion on shared processing for MBS broadcast and unicast reception Huawei, HiSilicon discussion Rel-18 NR\_MBS\_enh-Core

[R2-2307596](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307596%20Rel-18%20MII%20Enhancements.docx) Rel-18 MII Enhancements Samsung R&D Institute India discussion

[R2-2307675](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2307675%20Discussion%20on%20the%20reporting%20signaling%20for%20shared%20MBS%20capability.docx) Discussion on the reporting signaling for shared MBS capability Xiaomi discussion Rel-18 NR\_MBS\_enh-Core

[R2-2308306](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2308306%20Discussion%20on%20shared%20processing.docx) Discussion on shared processing CMCC discussion Rel-18 NR\_MBS\_enh-Core

[R2-2308345](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2308345%20Non-serving%20cell%20configuration%20update%20in%20case%20of%20shared%20processing.doc) Non-serving cell configuration update in case of shared processing ZTE, Sanechips discussion Rel-18 NR\_MBS\_enh-Core

[R2-2308744](file:///C:\Users\Dwx974486\Documents\3GPP\Extracts\R2-2308744%20Shared_Processing%20Scenarios.docx) Additional scenarios for shared processing Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_MBS\_enh-Core