3GPP TSG-RAN WG2 Meeting #123bis DRAFT\_ R2-2311277

Xiamen, China, October 9th – 13th, 2023

Source: Session chair (Huawei)

Title: Report from session on MBS, QoE and LTE legacy

Agenda Item: 8.7

# Offline discussions

Pre-meeting summary:

* [Pre123bis][601][eMBS] Summary of 7.11.3

Scope:

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

Intended outcome: Report in R2-2311259

Deadline (for comments on the summary): Monday 2023-10-09 17:00

Kicked-off together with a meeting start:

* [AT123bis][600] Organizational – Session on MBS, QoE and LTE legacy

Scope:

* + - Share plans and list of ongoing email discussions for the session on MBS, QoE and LTE legacy
    - Share meeting notes and agreements for review and endorsement

Kicked-off after Monday QoE session:

* [AT123bis[602][QoE] LS to SA4/SA5 on area scope (Qualcomm)

Scope: Draft an LS to SA4/SA5 to check whether it is OK that polygon-based area scope is not supported for QoE applicable to RRC IDLE/INACTIVE

Intended outcome: Agreeable LS in R2-2311400

Deadline: Thursday 2023-10-12 11:00 (LS uploaded for approval during CB session)

* [AT123bis[603][QoE] Reply to RAN3 LS on QMC support in RRC\_IDLE and RRC\_INACTIVE (China Unicom)

Scope: Discuss the reply to LS from RAN3 in R2-2309443, including:

* which of the issues with storing of QoE configurations at the UE mentioned during the online discussion are relevant to be mentioned in the reply LS
* session status indication

Intended outcome: Agreeable LS in R2-2311401

Deadline: Thursday 2023-10-12 11:00 (LS uploaded for approval during CB session)

## 2.4 Instructions

Rel-17 maintenance CRs

* Only essential/critical corrections are expected
* Editorial and clarification corrections should be sent to be reviewed and approved by spec rapporteurs prior to submission.
* Editorials corrections should be collected and submitted by spec rapporteurs.

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).

- Spec rapporteur list of open issues for Rel-18 items

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).

Tdoc submission for RAN2#123bis deadline

* Sept 29th 1000 UTC

# 4 EUTRA Rel-17 and earlier

Only essential corrections. No documents should be submitted to 4. Please submit to 4.x

## 4.1 EUTRA corrections Rel-17 and earlier

(NB\_IOTenh4\_LTE\_eMTC6-Core; leading WG: RAN1; REL-17; WID: RP-211340)

(UPIP\_EN-DC\_UE; leading WG: RAN3; REL-17; WID: [RP‑213669](http://ftp.3gpp.org/tsg_ran/TSG_RAN/TSGR_94e/Docs/RP-213669.zip))

(LTE TEI17)

Essential corrections to LTE Rel-17 topics not covered by other agenda items.

(NB\_IOTenh3-Core; leading WG: RAN1; REL-16; started: Jun 18; Completed: June 20; WID: RP-200293); REL-15 and Earlier NB-IoT WIs are in scope but not listed explicitly (long list).

(LTE\_eMTC5-Core; LTE\_eMTC5-Core; leading WG: RAN1; REL-16; started: Jun 18; Completed: June 20; WID: RP-192875;), REL-15 and Earlier eMTC WIs are in scope but not listed explicitly (long list).

(LTE\_feMob-Core; leading WG: RAN2; REL-16; started: Jun 18; Completed: June 20; WID: RP-190921);

(LTE\_terr\_bcast-Core, LTE\_DL\_MIMO\_EE-Core, LTE\_high\_speed\_enh2-Core; LTE TEI16 Non-positioning);

REL-15 and Earlier EUTRA WIs are in scope but not listed explicitly (long list), Except V2X and Sidelink WIs and Positioning WIs, which are adressed by AIs below.

NOTE that LTE corrections related to NR WIs or Joint NR LTE WIs should be submitted to NR AIs below.

NOTE that LTE corrections which are the same as an NR correction should be submitted to the respective NR AI (so the NR CR and LTE CR can be treated together).

This Agenda Item is treated in the EUTRA Breakout session

[R2-2309763](file:///D:\3GPP\Extracts\R2-2309763%20-%20MAC%20correction%20on%20DRX%20inactivity%20timer%20for%20eMTC%20UE-R17.doc) MAC correction on drx-InactivityTimer for eMTC UE Xiaomi CR Rel-17 36.321 17.6.0 1569 - F NB\_IOTenh4\_LTE\_eMTC6-Core

[R2-2309764](file:///D:\3GPP\Extracts\R2-2309764%20-%20MAC%20correction%20on%20DRX%20inactivity%20timer%20for%20eMTC%20UE-R16.doc) MAC correction on drx-InactivityTimer for eMTC UE Xiaomi CR Rel-16 36.321 16.8.0 1570 - F LTE\_eMTC5-Core

* Chair: This has been discussed in the previous meeting and it was agreed it can be considered to put the change in the MAC rapporteur CR. However, even though the cover page is on the same issue, the actual change is different.

[R2-2309778](file:///D:\3GPP\Extracts\R2-2309778%20Correction%20on%20the%20UL%20HARQ%20RTT%20timer%20length%20r16.docx) Correction on the UL HARQ RTT timer length MediaTek Inc., Apple CR Rel-16 36.321 16.8.0 1571 - F NB\_IOTenh3-Core

[R2-2309779](file:///D:\3GPP\Extracts\R2-2309779%20Correction%20on%20the%20UL%20HARQ%20RTT%20timer%20length%20r17.docx) Correction on the UL HARQ RTT timer length MediaTek Inc., Apple CR Rel-17 36.321 17.6.0 1572 - A NB\_IOTenh3-Core

[R2-2309780](file:///D:\3GPP\Extracts\R2-2309780%20Correction%20on%20the%20UL%20HARQ%20RTT%20timer%20length.docx) Correction on the UL HARQ RTT timer length MediaTek Inc., Apple discussion

## 7.11 Enhancements of NR Multicast and Broadcast Services

(NR\_MBS\_enh-Core; leading WG: RAN2; REL-18; WID: RP-231829)

Time budget: 0.5 TU

Tdoc Limitation: 3 tdocs

### 7.11.1 Organizational

LS in, rapporteur input, running CRs, open issues list etc.

The rapporteurs of CRs which were not endorsed yet are requested to provide first versions of the CRs to the meeting

**LSin**

[R2-2309425](file:///D:\3GPP\Extracts\R2-2309425_R1-2308612.docx) Reply LS on multicast reception in RRC\_INACTIVE (R1-2308612; contact: Apple) RAN1 LS in Rel-18 NR\_MBS\_enh-Core To:RAN2

**Open issues**

[R2-2309555](file:///D:\3GPP\Extracts\R2-2309555%20Open%20issue%20list%20for%20NR%20MBS%20enhancements.docx) Open issue list for NR MBS enhancements CATT, Huawei, HiSilicon, Apple, vivo, Xiaomi, CMCC Work Plan Rel-18 NR\_MBS\_enh-Core

**Running CRs**

[R2-2309561](file:///D:\3GPP\Extracts\R2-2309561%20Introduction%20of%20eMBS%20UE%20Capabilities%20into%20TS%2038.306.docx) Introduction of eMBS UE Capabilities into TS 38.306 vivo draftCR Rel-18 38.306 17.6.0 B NR\_MBS\_enh-Core

[R2-2309562](file:///D:\3GPP\Extracts\R2-2309562%20Introduction%20of%20eMBS%20UE%20Capabilities%20into%20TS%2038.331.docx) Introduction of eMBS UE Capabilities into TS 38.331 vivo draftCR Rel-18 38.331 17.6.0 B NR\_MBS\_enh-Core

[R2-2310310](file:///D:\3GPP\Extracts\R2-2310310%20MAC%20Running%20CR%20for%20eMBS.docx) MAC Running CR for eMBS Apple draftCR Rel-18 38.321 17.6.0 B NR\_MBS\_enh-Core

[R2-2310711](file:///D:\3GPP\Extracts\R2-2310711%20RRC%20Running%20CR%20for%20eMBS.docx) RRC running CR for eMBS Huawei, HiSilicon draftCR Rel-18 38.331 17.6.0 B NR\_MBS\_enh-Core

**UE capabilities**

[R2-2309567](file:///D:\3GPP\Extracts\R2-2309567%20Further%20Consideration%20on%20UE%20Capability%20of%20eMBS.docx) Further Consideration on UE Capability of eMBS vivo discussion Rel-18 NR\_MBS\_enh-Core [R2-2307112](file:///D:\3GPP\Extracts\R2-2307112%20Initial%20Consideration%20on%20UE%20Capability%20of%20eMBS.docx)

### 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 report of “[Post123][606][eMBS] Session activation/deactivation and state transitions (CATT)”

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. resume cause and access control for connection resume due to MBS, resume due to bad reception quality (e.g. ping-pong issue handling) etc.)

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

- co-existence between multicast reception in INACTIVE and SDT

- whether additional frequency prioritization mechanism is needed, details of multicast NCL

- UE capabilities

NOTE: Aspects covered by e-mail discussion [606] should not be discussed in companies contributions.

**Report of [Post123][606][eMBS] Session activation/deactivation and state transitions (CATT)**

[R2-2309556](file:///D:\3GPP\Extracts\R2-2309556%20Report%20of%20%5bPost123%5d%5b606%5d%5beMBS%5d%20Session%20activation%20deactivation%20and%20state%20transitions.docx) Report of [Post123][606][eMBS] Session activation deactivation and state transitions CATT discussion Rel-18 NR\_MBS\_enh-Core

* ?? Revised in [R2-2311257](file:///D:\3GPP\Extracts\R2-2311257%20Report%20of%20%5bPost123%5d%5b606%5d%5beMBS%5d%20Session%20activation%20deactivation%20and%20state%20transitions.docx)

[R2-2311257](file:///D:\3GPP\Extracts\R2-2311257%20Report%20of%20%5bPost123%5d%5b606%5d%5beMBS%5d%20Session%20activation%20deactivation%20and%20state%20transitions.docx) Report of [Post123][606][eMBS] Session activation deactivation and state transitions CATT discussion Rel-18 NR\_MBS\_enh-Core

Potential easy agreement

Proposal 1(12/14): Introduce an explicit indication in the multicast MCCH/RRCRelease(i.e., in the IE MBSMulticastConfiguration) for the session deactivation notification.

Proposal 2(12/14): The indication in P1 is used for notification triggered by the multicast session deactivation or the temporary no data.

Proposal 3(12/14): The indication in P1 indicates “the stop of G-RNTI monitoring” to UE(i.e., the session deactivation status/ temporary no data status is not indicated to UE).

Proposal 4(14/14): UE in RRC\_INACTIVE does not need to monitor multicast MCCH DCI in the current cell until next group paging is received if UE is notified “the stop of G-RNTI monitoring” for all the joined multicast sessions, including the following cases,

Case 1: UE is receiving multicast in RRC\_INACTIVE and then is notified about the session deactivation via MCCH.

Case 2: UE transits from RRC\_CONNECTED to RRC\_INACTIVE, and “the stop of G-RNTI monitoring” is indicated in RRCRelease message.

Proposal 7(14/14): If UE receives PTM configuration of multicast session(s) in RRCRelease and “the stop of G-RNTI monitoring” is indicated for the corresponding session(s) and then UE selects the same cell as on which it received RRCRelease, UE starts to monitor MCCH DCI upon receiving group paging that indicates to allow the multicast reception in RRC\_INACTIVE.

Proposal 8(12/15): If “the stop of G-RNTI monitoring” for a session is indicated in RRCRelease message and the PTM configuration of the corresponding multicast session is not included in same message , UE reads multicast MCCH(if present) upon receiving group paging that indicates to allow the multicast reception in RRC\_INACTIVE.

Proposal 9(9/11): If the whole Rel-18 multicast related configuration is absent in RRC Release, UE behaves the same as Rel-17 MBS UE.

Proposal 10(12/14): If the session is active and UE receives PTM configuration in RRCRelease message and then UE selects the same cell as it received RRCRelease, UE does not perform Multicast MCCH information acquisition immediately but starts to monitor MCCH DCI for possible change notification after transiting to INACTIVE.

Proposals for further discussion

Proposal 5(11/15): UE in RRC\_INACTIVE reads MCCH(if present) on the reselected cell after cell reselection to acquire the PTM configuration session if UE received“the stop of G-RNTI monitoring” indication for the session .

Proposal 6(7/11): If UE receives PTM configuration of multicast session(s) in RRCRelease and “the stop of G-RNTI monitoring” is indicated for the corresponding session(s) and then UE selects the same cell as on which it received RRCRelease, UE acquires the PTM configuration from MCCH upon receiving group paging that indicates to allow the multicast reception in RRC\_INACTIVE.

**Resume due to bad quality**

[R2-2309538](file:///D:\3GPP\Extracts\R2-2309538%20Leftover%20CP%20issues%20on%20Multicast%20reception%20in%20RRC_INACTIVE.doc) Leftover CP issues on Multicast reception in RRC\_INACTIVE ZTE, Sanechips discussion Rel-18 NR\_MBS\_enh-Core

Proposal 1 No need to solve the ping-pong issue when resuming RRC connection due to poor reception quality.

Proposal 2 UE will resume RRC connection if the measured RSRP or RSRQ becomes lower than the threshold consistently after a time interval.

[R2-2310550](file:///D:\3GPP\Extracts\R2-2310550%20RRC%20Resume%20Due%20to%20Bad%20Reception%20Quality%20of%20Multicast.docx) RRC Resume Due to Bad Reception Quality of Multicast Sharp discussion

Proposal 1 The RSRP/RSRQ is L3 measurement.

Proposal 2 The timer can be configured to avoid the ping-pong issue.

Proposal 3 The timer is configured per Cell via RRCRelease or multicast MCCH message.

[R2-2310087](file:///D:\3GPP\Extracts\R2-2310087%20CP%20aspects%20for%20Multicast%20reception%20in%20RRC_INACTIVE.docx) CP aspects for Multicast reception in RRC\_INACTIVE Samsung R&D Institute India discussion Rel-18

Proposal 1: To provide a robust and effective method for channel quality based state transition:

(a) Channel measurements for the multicast UEs are L3 measurements based on cell specific SSB reference signals

(b) Signal strength/quality (RSRP or RSRQ) and state transition time ‘T’ are considered for threshold configuration to avoid false alarms/ping-pongs.

(c) Threshold configuration applicability or not applicability for each of the multicast session can be configured

(d) Threshold configuration for the applicable sessions is common i.e. not differently configured per session.

(e) Channel quality based state transition method is performed only when UE is receiving at least one applicable and active multicast session

**Remaining aspects of state transitions**

[R2-2311034](file:///D:\3GPP\Extracts\R2-2311034%20notif&state-transitions-rrc-inactive.docx) Remaining aspects of RRC state transition and notifications not concluded by [Post123][606] Qualcomm Incorporated discussion Rel-18 NR\_MBS\_enh-Core

Proposal 1. RAN2 confirms that a deployment scenario where the network does not use multicast MCCH but provides the configuration for multicast in RRC\_INACTIVE using RRCRelease is supported.

Proposal 2. RAN2 confirms that a UE receiving multicast in RRC\_INACTIVE without receiving any configuration/indication about the multicast session via an RRCRelease message beforehand is NOT a valid scenario.

Proposal 3. If a multicast session is not yet activated and the UE is released without any indication in RRCRelease message about reception of the multicast session in RRC\_INACTIVE, the UE goes back to RRC\_CONNECTED when the session activation is indicated by the group paging.

Proposal 4. For RRC\_CONNECTED UEs being released to RRC\_INACTIVE, the RRCRelease message indicates whether MCCH is being broadcasted in the cell.

**MRBs handling**

[R2-2310048](file:///D:\3GPP\Extracts\R2-2310048%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 Xiaomi discussion Rel-18

Proposal 7: The identity of the multicast MRB which is used for the multicast reception in RRC\_INACTIVE needs to be configured for the UE.

Proposal 8: For the MRB in RRC\_CONNECTED which cannot be used in RRC\_INACTIVE, it shall be suspended in the RRC\_INACTIVE as legacy.

[R2-2311066](file:///D:\3GPP\Extracts\R2-2311066_eMBS_CP-open-issues.doc) Other CP open issues for multicast reception in INACTIVE Kyocera discussion Rel-18

Proposal 1 RAN2 should agree that the multicast MRB used in Connected should be suspended in case it cannot be used in INACTIVE, and another multicast MRB for INACTIVE is newly established.

Proposal 2 RAN2 should discuss whether the UE is explicitly indicated in RRC Release with 1-bit indicator for each multicast MRB (or each TMGI) whether the multicast MRB used in Connected should be suspended or continued to be used in INACTIVE.

Proposal 3 RAN2 should agree that no MRB ID is needed in the PTM configuration provided by Multicast MRB, i.e., same as Rel-17 Broadcast MRB.

**Resume cause**

[R2-2309564](file:///D:\3GPP\Extracts\R2-2309564%20Discussion%20on%20Remaining%20Issues%20for%20eMBS%20CP.doc) Discussion on Remaining Issues for eMBS CP vivo discussion Rel-18 NR\_MBS\_enh-Core

Proposal 4: mt-Access is selected for multicast reception when it is applicable to the legacy mt-Access use case (i.e. it is not applicable to access identities 1, 2 and 11-15).

Proposal 5: UE selects '0' as the Access Category when the resumption of the RRC connection is triggered for multicast reception.

[R2-2310712](file:///D:\3GPP\Extracts\R2-2310712%20CP%20issues%20for%20multicast%20reception%20for%20RRC_INACTIVE%20UE.docx) CP issues for multicast reception for RRC INACTIVE UE Huawei, HiSilicon discussion Rel-18 NR\_MBS\_enh-Core

Proposal 3a: MO-data is used for MBS resume due to bad quality or lack of SIBx/PTM configuration.

Proposal 3b: MO-data triggered by NAS and MO-data triggered for MBS need to be separately handled for UAC procedure, e.g., for MO-data triggered for MBS, the UE’s AS layer should re-initiate the procedure when barring is alleviated.

**MBS + SDT**

[R2-2310574](file:///D:\3GPP\Extracts\R2-2310574.docx) Discussion on co-existence between multicast reception in INACTIVE and SDT ITRI discussion NR\_MBS\_enh-Core [R2-2307895](file:///D:\3GPP\Extracts\R2-2307895.docx)

Proposal 1: Network could configure SDT and MBS multicast reception in RRC\_INACTIVE together.

Proposal 2: The UE configured for MBS multicast reception in RRC\_INACTIVE should monitor the group paging during SDT.

Proposal 3: For a UE that does not support simultaneous reception of SDT and MBS multicast, the following principles should be adhered to:

Principle 1: The UE should not trigger SDT procedure while MBS multicast reception is ongoing.

Principle 2: The UE should not perform MBS multicast data reception during SDT.

[R2-2309557](file:///D:\3GPP\Extracts\R2-2309557%20Remaining%20CP%20Issues%20for%20Multicast%20reception%20in%20RRC_INACTIVE.docx) Remaining CP Issues for Multicast reception in RRC\_INACTIVE CATT, CBN discussion Rel-18 NR\_MBS\_enh-Core

[R2-2309801](file:///D:\3GPP\Extracts\R2-2309801%20Remaining%20control%20plane%20issues%20for%20multicast%20reception%20in%20RRC%20INACTIVE.docx) Remaining control plane issues for multicast reception in RRC INACTIVE MediaTek inc. discussion Rel-18 NR\_MBS\_enh-Core

[R2-2309837](file:///D:\3GPP\Extracts\R2-2309837%20Control%20plane%20for%20multicast%20reception%20in%20RRC_INACTIVE%20state.docx) Further discussion on control plane for multicast reception in RRC\_INACTIVE state TD Tech, Chengdu TD Tech discussion Rel-18

[R2-2309846](file:///D:\3GPP\Extracts\R2-2309846%20MCCH%20change%20notification%20for%20multicast%20sessions%20in%20RRC_INACTIVE%20state.docx) MCCH change notification for multicast sessions in RRC\_INACTIVE state TD Tech, Chengdu TD Tech discussion

[R2-2309859](file:///D:\3GPP\Extracts\R2-2309859%20Remaining%20issues%20on%20PTM%20configuration%20and%20notification.docx) Remaining issues on PTM configuration and notification LG Electronics Inc. discussion Rel-18 NR\_MBS\_enh-Core

[R2-2309860](file:///D:\3GPP\Extracts\R2-2309860%20Remaining%20issues%20on%20multicast%20servic%20continuity.docx) Remaining issues on multicast servic continuity LG Electronics Inc. discussion Rel-18 NR\_MBS\_enh-Core

[R2-2309946](file:///D:\3GPP\Extracts\R2-2309946%20MBS_CP.docx) Control plane aspects of multicast reception in RRC\_INAVTICE Lenovo discussion Rel-18

[R2-2310015](file:///D:\3GPP\Extracts\R2-2310015.doc) Discussion on Service Continuity and RRC state transitions Spreadtrum Communications discussion Rel-18

[R2-2310059](file:///D:\3GPP\Extracts\R2-2310059%20Discussion%20on%20control%20plane%20for%20multicast%20reception%20in%20RRC_INACTIVE%20-%20v2.docx) Discussion on control plane for multicast reception in RRC\_INACTIVE NEC Corporation. discussion Rel-18 NR\_MBS\_enh-Core

[R2-2310265](file:///D:\3GPP\Extracts\R2-2310265%20Discussion%20on%20CP%20open%20issues.docx) Discussion on CP open issues CMCC discussion Rel-18 NR\_MBS\_enh-Core

[R2-2310311](file:///D:\3GPP\Extracts\R2-2310311_CP%20issues%20on%20multicast%20reception%20in%20RRC_INACTIVE_v0.doc) CP issues for multicast reception in RRC INACTIVE Apple discussion Rel-18 NR\_MBS\_enh-Core

[R2-2310549](file:///D:\3GPP\Extracts\R2-2310549%20Coexistence%20of%20SDT%20and%20Multicast%20reception%20in%20RRC_INACTIVE.docx) Coexistence of SDT and Multicast reception in RRC\_INACTIVE Sharp discussion

[R2-2310797](file:///D:\3GPP\Extracts\R2-2310797%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

[R2-2311065](file:///D:\3GPP\Extracts\R2-2311065_eMBS_resume-bad-quality_cause.doc) Consideration of RRC Resume due to bad quality and resume cause Kyocera discussion Rel-18

[R2-2311092](file:///D:\3GPP\Extracts\R2-2311092%20Discussion%20on%20PTM%20configuration%20for%20eMBS.docx) Discussion on PTM configuration for eMBS Shanghai Jiao Tong University discussion

[R2-2311236](file:///D:\3GPP\Extracts\R2-2311236%20Multicast%20reception%20in%20RRC_INACTIVE.docx) Multicast reception in RRC\_INACTIVE Ericsson discussion Rel-18 NR\_MBS\_enh-Core

[R2-2311237](file:///D:\3GPP\Extracts\R2-2311237%20MBS%20multicast%20and%20UE%20power%20saving.docx) MBS multicast and UE power saving 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 handling, details of PDCP COUNT continuity etc.)

- further discussion on PHY layer impacts (considering the LS in from RAN1 in R1-2306243 and R1-2308612) etc.

**DRX handling for retransmissions**

[R2-2310991](file:///D:\3GPP\Extracts\R2-2310991%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 1 : dl-DataToUL-ACK-MulticastDCI-Format4-1 or dl-DataToUL-ACK to be configured also for UE in inactive, i.e., it should be provided by MCCH or via RRCRelease message to the UE, which could be per TMGI (MBS service) or a general one for all multicast services.

Proposal 2: The UE in RRC\_INACTIVE state can use the existing rules for interpreting K1 (PDSCH-to-HARQ\_feedback timing indicator): For DCI format 4\_1, the PDSCH-to-HARQ\_feedback timing indicator field (K1) values are provided by dl-DataToUL-ACK-MulticastDCI-Format4-1 or, if dl-DataToUL-ACK-MulticastDCI-Format4-1 is not provided, by {1, 2, 3, 4, 5, 6, 7, 8}.

Proposal 3: UE always starts the timer in the nth symbol of the slot indicated by K1, where n could be configurable. If the configuration of n is not provided to the UE, then UE could use the hard coded values of the symbols and if the configuration is given, the UE could use the configured value of n.

[R2-2310478](file:///D:\3GPP\Extracts\R2-2310478%20eMBS%20UP.docx) UP Aspects for Multicast Reception Samsung discussion Rel-18 NR\_MBS\_enh-Core

Proposal 4. Similar to RRC\_CONNECTED UEs, RRC configures candidates of k1 and PUCCH resource end points. DCI indicates the value to be used.

Proposal 5. drx-HARQ-RTT-TimerDLPTM is started at the first symbol after the PUCCH end-symbol.

[R2-2310700](file:///D:\3GPP\Extracts\R2-2310700%20Discussion%20on%20user%20plane%20open%20issues%20for%20eMBS.docx) Discussion on user plane open issues for eMBS LG Electronics Inc. discussion Rel-18 NR\_MBS\_enh-Core

Proposal 5. A UE starts the drx-HARQ-RTT-TimerDL for the corresponding HARQ process in the first symbol after the end of the corresponding multicast transmission.

[R2-2309802](file:///D:\3GPP\Extracts\R2-2309802%20Remaining%20User%20plane%20issues%20for%20multicast%20reception%20in%20RRC%20INACTIVE.docx) Remaining User plane issues for multicast reception in RRC INACTIVE MediaTek inc. discussion Rel-18 NR\_MBS\_enh-Core

Proposal 2: Introduce capability bit for RRC\_INACTIVE UE to receive PTM retransmission initiated by other UEs

Proposal 3: Whether and when UE start drx-HARQ-RTT-TimerDL-PTM and drx-RetransmissionTimerDL-PTM is up to UE implementation.

**Remaining MAC aspects**

[R2-2310312](file:///D:\3GPP\Extracts\R2-2310312_UP%20issues%20on%20multicast%20reception%20in%20RRC_INACTIVE_v0.doc) UP issues for multicast reception in RRC INACTIVE Apple discussion Rel-18 NR\_MBS\_enh-Core

Proposal 3: DRX Command MAC CE is applicable for inactive multicast DRX operation.

Proposal 5: Introduce a new fix RNTI value for multicast-MCCH-RNTI.

Proposal 6: The same LCID value is used for multicast MCCH and broadcast MCCH.

Proposal 7: When UE enters RRC\_INACTIVE, UE stops the multicast MBS related MAC timer, flush the soft buffers for the DL HARQ process being used for MBS multicast operation, same as R17.

**PDCP COUNT**

[R2-2310930](file:///D:\3GPP\Extracts\R2-2310930%20UP%20open%20Issues%20for%20MBS.docx) Remaining UP issues for MBS Ericsson discussion Rel-18 NR\_MBS\_enh-Core

Proposal 1: A simple 1-bit indication on cell PDCP COUNT synchronization for an MBS service is present with the INACTIVE MRB PTM configuration provided in RRCRelease.

Proposal 2: A UE in RRC INACTIVE receiving MBS considers PDCP COUNT synchronization across an RNA based on a sync indication received at state transition.

[R2-2309947](file:///D:\3GPP\Extracts\R2-2309947%20MBS_UP.docx) User plane aspects of multicast reception in RRC\_INAVTICE Lenovo discussion Rel-18

Proposal 1 Indication of a list of cells with synchronized PDCP COUNT is provided in multicast neighbour cell list.

Proposal 2 The UE does not reset the PDCP variables to initial values when moves to a cell with PDCP COUNT value synchronized.

Proposal 3 Besides cell reselection, cell selection should also be considered as a valid scenario for PDCP COUNT continuity.

Proposal 4 RAN2 discusses the solutions for the case that different MRB IDs/LCIDs may be allocated by different cells for a same MRB to support PDCP COUNT continuity during mobility.

**CFR aspects**

[R2-2309587](file:///D:\3GPP\Extracts\R2-2309587%20Remaining%20UP%20issues%20for%20multicast%20in%20RRC%20Inactive.docx) Remaining UP issues for multicast in RRC Inactive NEC discussion NR\_SL\_enh2

Proposal-5: When the Multicast CFR for RRC\_INACTIVE and Broadcast CFR are configured simultaneously, one of the two CFRs is covered by the other CFR.

[R2-2310266](file:///D:\3GPP\Extracts\R2-2310266%20Discussion%20on%20UP%20open%20issues.docx) Discussion on UP open issues CMCC discussion Rel-18 NR\_MBS\_enh-Core

Proposal 1: For multicast CFR in RRC\_INACTIVE and broadcast CFR, one CFR is not needed to be completely contained within the other one.

Proposal 2: RAN2 need to discuss if the multicast CFR in RRC\_CONNECTED and in RRC\_INACTIVE are different, how to insure the same PDSCH resources can be used.

[R2-2309539](file:///D:\3GPP\Extracts\R2-2309539%20Leftover%20UP%20issues%20on%20Multicast%20reception%20in%20RRC_INACTIVE.doc) Leftover UP issues on Multicast reception in RRC\_INACTIVE ZTE, Sanechips discussion Rel-18 NR\_MBS\_enh-Core

[R2-2309540](file:///D:\3GPP\Extracts\R2-2309540%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 [R2-2308344](file:///D:\3GPP\Extracts\R2-2308344%20CFR%20design%20for%20Multicast%20reception%20in%20RRC_INACTIVE.doc)

[R2-2309558](file:///D:\3GPP\Extracts\R2-2309558%20Remaining%20UP%20Issues%20for%20Multicast%20reception%20in%20RRC_INACTIVE.docx) Remaining UP Issues for Multicast reception in RRC\_INACTIVE CATT, CBN discussion Rel-18 NR\_MBS\_enh-Core

[R2-2309565](file:///D:\3GPP\Extracts\R2-2309565%20Discussion%20on%20Remaining%20Issues%20for%20eMBS%20UP.docx) Discussion on Remaining Issues for eMBS UP vivo discussion Rel-18 NR\_MBS\_enh-Core

[R2-2309845](file:///D:\3GPP\Extracts\R2-2309845%20Further%20discussion%20on%20user%20plane%20for%20multicast%20reception%20in%20RRC_INACTIVE%20state.docx) Further discussion on user plane for multicast reception in RRC\_INACTIVE state TD Tech, Chengdu TD Tech discussion Rel-18

[R2-2310016](file:///D:\3GPP\Extracts\R2-2310016.doc) Discussion on UP remaining issues for Multicast Spreadtrum Communications discussion Rel-18

[R2-2310058](file:///D:\3GPP\Extracts\R2-2310058%20Discussion%20on%20the%20data%20loss%20during%20the%20PDCP%20count%20synchronization.docx) Discussion on the data loss during the PDCP count synchronization Xiaomi discussion Rel-18

[R2-2310476](file:///D:\3GPP\Extracts\R2-2310476%20cfr-config-rrc-inactive.docx) Views on the FFS on the multicast CFR configuration aspects Qualcomm Incorporated discussion Rel-18 NR\_MBS\_enh-Core [R2-2307639](file:///D:\3GPP\Extracts\R2-2307639%20cfr-config-rrc-inactive.docx)

[R2-2310551](file:///D:\3GPP\Extracts\R2-2310551%20MRB%20Handling%20During%20the%20RRC%20State%20Transition.docx) MRB Handling During the RRC State Transition Sharp discussion

[R2-2310713](file:///D:\3GPP\Extracts\R2-2310713%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

### 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 FFS on whether CFR “location” needs to be also reported and how exactly this is captured in RRC (i.e. which IE is used)

**Report of [Pre123bis][601][eMBS] Summary of 7.11.3 Shared processing (Qualcomm)**

R2-2311259 [Pre123bis][601][eMBS] Summary of 7.11.3 Shared processing Qualcomm Incorporated (rapporteur) discussion Rel-18 NR\_MBS\_enh-Core

**The Tdocs** [**R2-2309559**](file:///D:\3GPP\Extracts\R2-2309559%20Remaining%20Issues%20on%20Shared%20Processing.docx) **through** [**R2-2311049**](file:///D:\3GPP\Extracts\R2-2311049%20MBS-capability-sharing.docx) **treated as part of [Pre123bis][601][eMBS]**

[R2-2309559](file:///D:\3GPP\Extracts\R2-2309559%20Remaining%20Issues%20on%20Shared%20Processing.docx) Remaining Issues on Shared Processing CATT, CBN discussion Rel-18 NR\_MBS\_enh-Core

[R2-2309566](file:///D:\3GPP\Extracts\R2-2309566%20Bandwidth%20Location%20Issue%20for%20Shared%20Processing%20Report.docx) Bandwidth Location Issue for Shared Processing Report vivo discussion Rel-18 NR\_MBS\_enh-Core

[R2-2310060](file:///D:\3GPP\Extracts\R2-2310060%20Discussion%20on%20shared%20process%20between%20broadcast%20and%20unicast.docx) Discussion on shared process between broadcast and unicast NEC Corporation. discussion Rel-18 NR\_MBS\_enh-Core

[R2-2310088](file:///D:\3GPP\Extracts\R2-2310088%20Shared%20processing%20for%20broadcast%20and%20unicast%20reception.docx) Shared processing for broadcast and unicast reception Samsung R&D Institute India discussion Rel-18

[R2-2310267](file:///D:\3GPP\Extracts\R2-2310267%20Discussion%20on%20shared%20processing.docx) Discussion on shared processing CMCC discussion Rel-18 NR\_MBS\_enh-Core

[R2-2310586](file:///D:\3GPP\Extracts\R2-2310586%20Discussion%20on%20the%20CFR%20location%20for%20shared%20MBS%20capability.docx) Discussion on the CFR location for shared MBS capability Xiaomi discussion Rel-18 NR\_MBS\_enh-Core

[R2-2310714](file:///D:\3GPP\Extracts\R2-2310714%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

[R2-2311006](file:///D:\3GPP\Extracts\R2-2311006%20Shared_Processing%20Scenarios.docx) Additional scenarios for shared processing Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_MBS\_enh-Core [R2-2308744](file:///D:\3GPP\Extracts\R2-2308744%20Shared_Processing%20Scenarios.docx)

[R2-2311049](file:///D:\3GPP\Extracts\R2-2311049%20MBS-capability-sharing.docx) Remaining aspects of shared processing for MBS broadcast and unicast reception Qualcomm Incorporated discussion Rel-18 NR\_MBS\_enh-Core

## 7.14 Enhancement on NR QoE management and optimizations for diverse services

(NR\_QoE\_enh-Core; leading WG: RAN3; REL-18; WID: RP-223488)

Time budget: 1 TU

Tdoc Limitation: 3 tdocs

### 7.14.1 Organizational

Including LSs and any rapporteur inputs (e.g. work plan, running CRs, open issues list)

**Work plan and open issues**

[R2-2310201](file:///D:\3GPP\Extracts\R2-2310201%20Revised%20Work%20Plan%20for%20Rel-18%20NR%20QoE%20Enhancement.docx) Revised Work Plan for Rel-18 NR QoE Enhancement China Unicom Work Plan NR\_QoE\_enh-Core

* Noted

[R2-2310204](file:///D:\3GPP\Extracts\R2-2310204%20%5bPost123%5d%5bQoE%5d%20Remaining%20Open%20Issues%20(China%20Unicom).doc) [Post123][QoE] Remaining Open Issues (China Unicom) China Unicom discussion

* Noted
* Ericsson thinks we need to discuss also other issues
* Chair: Open issue list will be used as a reference of most critical open issues that need to be solved to close WI. After the meeting the list will have to be updated and companies may raise missing issues and rapporteur may include if agreeable.

**Incoming LSes on area scope**

[R2-2309444](file:///D:\3GPP\Extracts\R2-2309444_R3-234746.docx) Reply LS on area scope for QoE measurements (R3-234746; contact: Samsung) RAN3 LS in Rel-18 NR\_QoE\_enh-Core To:RAN2 Cc:SA4, SA5

* Noted

[R2-2309478](file:///D:\3GPP\Extracts\R2-2309478_S4-231490.docx) Reply LS on area scope for QoE measurements (S4-231490; contact: Huawei) SA4 LS in Rel-18 NR\_QoE\_enh-Core To:RAN2 Cc:SA5, RAN3

* Noted

[R2-2309484](file:///D:\3GPP\Extracts\R2-2309484_S5-235782.doc) Reply LS on area scope for QoE measurements (S5-235782; contact: Huawei) SA5 LS in Rel-18 eQoE To:RAN2 Cc:SA4, RAN3

* Noted
* Samsung: RAN3 thinks area scope checking in RRC CONNECTED should be done by gNB
* Huawei: SA4 indicates consecutive filtering should be avoided while SA5 sees no issue with that

**Incoming LS on QoE configuration storage and retrieval**

[R2-2309443](file:///D:\3GPP\Extracts\R2-2309443_R3-234745.docx) LS on QMC support in RRC\_IDLE and RRC\_INACTIVE (R3-224745; contact: Ericsson) RAN3 LS in Rel-18 NR\_QoE\_enh-Core To:RAN2, SA2 Cc:SA5, SA3

* Noted

**Other incoming LSes**

[R2-2309445](file:///D:\3GPP\Extracts\R2-2309445_R3-234750.doc) LS on RAN3 progress on QoE in NR-DC (R3-234750; contact: ZTE) RAN3 LS in Rel-18 NR\_QoE\_enh-Core To:RAN2

[R2-2309479](file:///D:\3GPP\Extracts\R2-2309479_S4-231582.docx) Reply LS on buffer level threshold-based RVQoE reporting (S4-231582; contact: Apple) SA4 LS in Rel-18 NR\_QoE\_enh-Core To:RAN2, RAN3

[R2-2309481](file:///D:\3GPP\Extracts\R2-2309481_S5-235542.doc) Reply LS on the feasibility of introducing assistance information for handling of QoE reporting during RAN overload (S5-235542; contact: Huawei) SA5 LS in Rel-18 eQoE To:RAN3 Cc:RAN2

[R2-2309482](file:///D:\3GPP\TSGR2\TSGR2_123bis\Docs\R2-2309482.zip) Reply LS on Approval of eQoE CRs for NR (S5-235772; contact: Ericsson) SA5 LS in Rel-18 eQoE To:RAN2 Cc:RAN3, SA4, CT1, CT4

[R2-2309483](file:///D:\3GPP\Extracts\R2-2309483_S5-235781.doc) Reply LS on collecting QoE measurements per MBS service area and MBS session ID (S5-235781; contact: Huawei) SA5 LS in Rel-18 eQoE To:RAN3 Cc:RAN2

**Running CRs**

[R2-2310653](file:///D:\3GPP\Extracts\R2-2310653%2037.340%20Running%20CR%20to%20support%20QoE%20in%20NR-DC.docx) 37.340 Running CR to support QoE in NR-DC Nokia, Nokia Shanghai Bell draftCR Rel-18 37.340 17.6.0 B NR\_QoE\_enh-Core

[R2-2310755](file:///D:\3GPP\Extracts\R2-2310755%20-%20Running%20CR%20for%20QoE%20measurements.docx) Running CR for QoE enhancements in NR Ericsson CR Rel-18 38.331 17.6.0 4350 - B NR\_QoE\_enh-Core [R2-2307966](file:///D:\3GPP\Extracts\R2-2307966%20-%20Running%20CR%20for%20QoE%20measurements.docx)

### 7.14.2 QoE measurements in RRC\_IDLE INACTIVE

Including any further discussion on area scope handling for MBS QoE, considering the reply LS(es) from other WGs (R3-234746, S5-235782, S4-231490)

Including discussion on QoE configuration storing and retrieval at/from the UE, as per RAN3 LS in R3-234745

Including discussion on AS layer signalling details

**Area scope**

[R2-2310455](file:///D:\3GPP\Extracts\R2-2310455.doc) Discussion on QoE measurement in RRC\_IDLE and RRC\_INACTIVE Samsung discussion Rel-18 NR\_QoE\_enh-Core

Proposal 1. Consecutive filtering in both the UE (via LocationFilter) and NG-RAN (via Area Scope of QMC in NGAP signaling) should be avoided.

Proposal 2. For MBS QoE configuration,

- When UE is in RRC\_CONNECTED, the area scope check should be performed only by RAN via Area Scope of QMC IE in TS 38.413.

- When UE is in RRC\_IDLE or RRC\_INACTIVE, the area scope check should be performed only by UE application via LocationFilter

[R2-2310517](file:///D:\3GPP\Extracts\R2-2310517%20Discussion%20on%20area%20scope%20handling%20for%20MBS%20QoE.docx) Discussion on area scope handling for MBS QoE Huawei, HiSilicon discussion Rel-18 NR\_QoE\_enh-Core

Proposal 1: For QoE configurations applicable to RRC\_IDLE/INACTIVE state, area scope checking is performed by the UE AS layer when the UE is in RRC\_IDLE/INACTIVE state.

Proposal 2: For QoE configurations applicable to RRC\_IDLE/INACTIVE state, the UE does NOT perform QoE area scope checking when the UE is in RRC\_CONNECTED state, i.e. it remains under the responsibility of the network, as in Rel-17.

[R2-2310654](file:///D:\3GPP\Extracts\R2-2310654%20Further%20discussion%20on%20QoE%20for%20RRC%20IDLE%20%20and%20INACTIVE.docx) Further discussion on QoE for RRC IDLE and INACTIVE Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_QoE\_enh-Core

Proposal 1: RAN2 to confirm, for the same UE, NW can provide the area scope information to gNB via NGAP signalling and the area scope information to UE’s Application Layer via LocationFilter.

Proposal 2: RAN2 to confirm simultaneous area scope checking in both in UE and RAN should be avoided. For UE in RRC Connected, RAN performs the area scope check based on Area Scope provided over NGAP. For UE in RRC Idle/Inactive, UE performs the area scope check.

Proposal 3: The LocationFilter can include the PLMN and TA information.

Proposal 4: For UE in RRC IDLE and INACTIVE, either UE AS layer or APP layer can perform the area scope checking which may depend on how network indicates the area scope to UE.

DISCUSSION on P2 from R2-2310517:

* Qualcomm indicates both SA4 and SA5 see no issues with consecutive filtering, so QCM is not sure we need such restriction.
* Ericsson replied that SA4 indicated they want to avoid consecutive filtering. Nokia agrees.
* The UE does NOT perform QoE area scope checking when the UE is in RRC\_CONNECTED state, i.e. it remains under the responsibility of the network, as in Rel-17.

DISCUSSION on AS vs APP layer handling area scope checking in RRC IDLE/INACTIVE:

* Ericsson has preference for AS layer but both can work. Both need some enhancements to work and we need to focus on these.
* China Unicom prefer AS layer as APP based solution has more issues, e.g. area scope from app layer cannot be delivered to the network when UE connect in the new gNB.
* CATT agrees with China Unicom and prefers AS layer approach. CATT believes APP solution will not work.
* ZTE agrees both can work but prefers APP layer and indicates that both SA4/SA5 confirmed feasibility and the information in LocationFilter and the one in the network will be equivalent. From RAN2 perspective APP layer solution is simpler.
* CMCC thinks both can be applied at the same time.
* QCM prefers application layer since this is easier. We need to discuss many details, e.g. UE behaviour when entering/crossing area scope, also buffering area scope at the UE is a problem.
* Samsung indicates that the main reason for LS to SA4/SA5 was to check feasibility of LocationFilter approach and they confirmed it’s feasible.
* China Unicom thinks we can use the buffer we have for QoE reports for storing area scope, so no new UE requirement. LocationFilter cannot work with UE-based solution that RAN3 is discussing while AS layer approach can work with both CN-based and UE-based solution.
* Huawei prefer AS layer approach. There are impacts from APP layer, e.g. UE needs to report RRC state to APP layer. The size of area scope is not large, e.g. only 2kBytes. We should not specify both solutions.
* Apple points out the potential issue that with some application cannot access location info, e.g. if a user does not agree to that.
* Ericsson agrees that with AS layer it will be easier to handle area scope checking in different RRC states.
* Nokia has a concern with Uu interface overhead since the size may be as large as 4kBytes.
* QCM thinks we introduce more open issues with AS layer approach. For APP layer there is a smaller number of issues to solve.
* Ericsson does not think polygon will be used for QoE and indicates the information sent via LocationFilter or RRC will be the same, so does not see an issue with the Uu overhead.
* QCM thinks for AS layer solution we cannot support polygon-based area definition. We need to check with SA4 if this is OK.
* Ericsson indicates polygon-based is not used for area scope for QoE even in Rel-17.
* QCM thinks that in Rel-17 it is possible to use LocationFilter with polygon-based area scope checking. Nokia shares this view and thinks we need to check with SA4.

Show of hands:

* APP layer: 3
* AS layer: 5
* Working assumption: For QoE configurations applicable to RRC\_IDLE/INACTIVE state, area scope checking is performed by the UE AS layer when the UE is in RRC\_IDLE/INACTIVE state.
* Send an LS to SA4/SA5 to check whether it is OK that polygon-based area scope is not supported for QoE applicable to RRC IDLE/INACTIVE (offline QCM)

**QoE configuration storage and retrieval (RAN3 LS reply)**

[R2-2310570](file:///D:\3GPP\Extracts\R2-2310570%20Consideration%20on%20QoE%20measurement%20in%20IDLE%20and%20INACTIVE.docx) Consideration on QoE measurement in IDLE and INACTIVE ZTE Corporation, Sanechips discussion Rel-18 NR\_QoE\_enh-Core

Observation 1:UE based solution requires UE to at least store QoE reference, MCE IP address, measConfigAppLayerID, service type, QoE measurement type available RVQoE metrics(WA) when in idle state and report back to reconnected gNB after setting up new connection.

Observation 2: It is always feasible for UE to store more information in AS layer and reports back to NW in RAN2 signalling, e.g, RAN2 has already agreed at least service type and measConfigAppLayerID can be supported.

Proposal 1: Include below information in idle/inactive QoE configuration, when provided, UE stores them in AS layer when in idle state：

– QoE reference.

– The IP address or ID of the Measurement Collection Entity.

– QoE measurement type (s-based or m-based measurement) for MBS broadcast service.

[R2-2310448](file:///D:\3GPP\Extracts\R2-2310448%20Discussion%20on%20remaining%20issues%20for%20QoE%20measurements%20in%20RRC%20IDLE%20and%20INACTIVE%20state.docx) Discussion on remaining issues for QoE measurements in RRC IDLE and INACTIVE state CATT discussion Rel-18 NR\_QoE\_enh-Core

Proposal 1: Considering UE already has to store some configuration information, it is feasible for gNB to store and retrieve IDLE/INACTIVE QoE configurations via UE based solution.

Proposal 2: UE should send the QoE measurement session status indication together with available indication or included in QoE report to the network when UE returns to RRC\_CONNECTED state.

Proposal 3: When UE is in RRC\_IDLE state, UE AS layer should also store the configured information including: Area scope information, QoE reference, MCE ID/IP address, QoE measurement type and available RAN visible QoE metrics if UE based solution is adopted.

DISCUSSION on P1 from 0448:

* Huawei agrees this is feasible and we can reply this to RAN3.
* Ericsson think there can be some security issue and we need to ask SA3.
* QCM thinks it is feasible but we should raise an issue with Uu signalling which needs to be sent each time to the new gNB. Also there is an issue with UE storing this information.
* Nokia agrees with Ericsson and QCM. Other issues: the delay of delivering this information form the UE to gNB, MCE ID requires some mapping. These also should be mentioned.
* Samsung is OK with the proposal. Security should be activated before UE sends this information, so no security issue.
* For RAN3 reply LS, we indicate:
  + - It is feasible for gNB to store and retrieve IDLE/INACTIVE QoE configurations via UE based solution.
* **We will indicate some issues, discuss offline what is agreeable to be indicated in the LS (e.g. Uu overhead, security, UE buffer size etc.) (offline China Unicom)**
* **Include discussion on session status indication in the offline**

**Further details related to area scope handling**

[R2-2310752](file:///D:\3GPP\Extracts\R2-2310752%20-%20QoE%20measurements%20IDLE%20INACTIVE.docx) QoE measurements in RRC\_INACTIVE and RRC\_IDLE Ericsson discussion NR\_QoE\_enh-Core

Proposal 1 If RAN2 agrees that the UE AS handles the area scope monitoring in RRC\_INACTIVE and RRC\_IDLE state, RAN2 should send an LS to CT1, asking CT1 to extend the +CAPLEVMCNR AT command with an “inside area”/”outside area” indication or specify a new AT command for conveying such an indication from the UE AS to the UE application.

Proposal 2 If RAN2 agrees that the UE application handles the area scope monitoring in RRC\_INACTIVE and RRC\_IDLE state using the area indicated in the LocationFilter, RAN2 should send an LS to SA4 requesting them to update the LocationFilter with PLMN and TA lists. (A draft LS is included in the annex.)

Proposal 3 If RAN2 agrees that the UE application handles the area scope monitoring in RRC\_INACTIVE and RRC\_IDLE state using the area indicated in the LocationFilter, RAN2 should send an LS to CT1 requesting them to update the +C5GREG AT command with the PLMN ID as an additional location information element.

Proposal 4 The UE checks the PLMN of the target gNB when reconnecting from RRC\_IDLE to RRC\_CONNECTED state, or when entering RRC\_CONNECTED state after having been deregistered from the network, and indicates to the new gNB that it has QoE reports to transmit, only if the PLMN ID of the new gNB is the same as the PLMN ID where the UE received the QoE configuration, or one of the equivalent PLMNs, or (if the UE is aware of a list of PLMNs in the area scope) one of the PLMNs listed in the area scope.

Proposal 5 If the UE has stored the network version of the QoE measurement configuration in RRC\_IDLE state, then, when returning to RRC\_CONNECTED state, the UE checks the PLMN ID of new gNB and only if the PLMN ID of the new gNB is the same as the PLMN ID where the UE received the QoE configuration, or one of the equivalent PLMNs, or (if the UE is aware of a list of PLMNs in the area scope) one of the PLMNs listed in the area scope.

Proposal 6 When a UE configured with the QoE measurements returns from RRC\_INACTIVE or RRC\_IDLE state to RRC\_CONNECTED state, it should send a session status indication to the new serving gNB.

[R2-2310203](file:///D:\3GPP\Extracts\R2-2310203%20Discussion%20on%20QoE%20measurements%20in%20RRC_IDLE%20and%20INACTIVE%20states.docx) Discussion on QoE measurements in RRC\_IDLE and INACTIVE states China Unicom discussion NR\_QoE\_enh-Core

[R2-2310240](file:///D:\3GPP\Extracts\R2-2310240%20Remaining%20issue%20on%20QoE%20in%20RRC_IDLE%20and%20RRC_INACTIVE.docx) Remaining issues on QoE in RRC\_IDLE and RRC\_INACTIVE CMCC discussion Rel-18 NR\_QoE\_enh-Core

[R2-2310514](file:///D:\3GPP\Extracts\R2-2310514%20Discussion%20on%20QoE%20measurements%20in%20RRC_IDLE%20INACTIVE.docx) Discussion on QoE measurements in RRC\_IDLE/INACTIVE Huawei, HiSilicon discussion Rel-18 NR\_QoE\_enh-Core

[R2-2310782](file:///D:\3GPP\Extracts\R2-2310782-QoE%20for%20IDLE%20and%20Inactive%20state.docx) Open issues on QoE collection for IDLE and Inactive state Qualcomm Incorporated discussion NR\_QoE\_enh-Core

### 7.14.3 Rel-17 leftover topics for QoE

Including discussion on Rel-17 leftover topics as agreed in previous meetings.

NOTE: Discussion on buffer level threshold based triggering was put on hold in RAN2 until further progress from SA4/RAN3

**This AI will be deprioritized during RAN2#123bis meeting**

[R2-2310336](file:///D:\3GPP\Extracts\R2-2310336%20Views%20on%20Way%20Forward%20of%20Buffer%20Level%20Threshold%20Based%20RVQoE%20Reporting.docx) Views on Way Forward of Buffer Level Threshold Based RVQoE Reporting Apple discussion Rel-18 NR\_QoE\_enh-Core

### 7.14.4 Support of QoE measurements for NR-DC

Remaining RAN2 aspects of QoE support in NR-DC, including any new impact stemming from RAN3 agreements (e.g. as per LS in R3-234750).

**QoE handling over (deactivated) SCG**

[R2-2310453](file:///D:\3GPP\Extracts\R2-2310453.docx) Discussion on QoE measurements for MR-DC NEC discussion Rel-18 NR\_QoE\_enh-Core

Observation 1 For the QoE reporting configured to be reported via SRB5, it is up to network implementation to reconfigure the reporting leg to SRB4 or pause the QoE reporting. No specification impacts are foreseen.

Proposal 1 UE should not request to activate SCG only for the purpose of RVQoE reporting via SRB5.

[R2-2310783](file:///D:\3GPP\Extracts\R2-2310783-Open%20issues%20to%20support%20DC-based%20QoE.docx) Open issues to support QoE collection in NR-DC Qualcomm Incorporated discussion NR\_QoE\_enh-Core

Proposal 1: UE should request to activate SCG for RVQoE reporting if there is no activated bearer for RVQoE reporting.

[R2-2310456](file:///D:\3GPP\Extracts\R2-2310456.doc) Discussion on QoE measurement for NR-DC Samsung discussion Rel-18 NR\_QoE\_enh-Core

Proposal 1. When UE cannot send RVQoE report because the configured RVQoE specific SRB is not available, UE discards the RVQoE report.

Proposal 2. Introduce a new indicator (ex, rrc-SegAllowed-SN-r17) for NW to inform UE of whether SN allows RRC segmentation via SRB5.

**RAN3 LS/agreements confirmation**

[R2-2310753](file:///D:\3GPP\Extracts\R2-2310753%20-%20QoE%20measurements%20in%20NR-DC.docx) QoE measurements in NR-DC Ericsson discussion NR\_QoE\_enh-Core

Proposal 7 Confirm RAN3’s agreement in the context of an s-based QoE configuration received by MN where

• MN sends the QoE configuration via SRB1

• QoE reports can be sent via SRB4 or SRB5

Proposal 8 Confirm RAN3’s agreements on defining two different reporting leg indications for QoE and RVQoE, i.e., the RAN will indicate to the UE which SRB shall be used for legacy QoE and which SRB shall be used for RVQoE measurement reporting.

Proposal 9 Confirm RAN3 agreement that for a UE in NR-DC, each legacy QoE configuration can have only one corresponding RVQoE configuration when needed.

[R2-2310571](file:///D:\3GPP\Extracts\R2-2310571%20Consideration%20on%20QoE%20measurement%20for%20NR-DC.docx) Consideration on QoE measurement for NR-DC ZTE Corporation, Sanechips discussion Rel-18 NR\_QoE\_enh-Core

Proposal 1: An explicit indication is introduced to indicate which bearer should be used for RVQoE reporting per QoE configuration.

Proposal 2: QoE report (e.g., either encapsulated QoE or RVQoE) associated with the non-receiving RAN node, can be send to the receiving RAN node via MeasurementReportAppLayer message if configured by NW.

Proposal 3: QoE report over ULInformationTransferMRDC is not supported.

[R2-2310202](file:///D:\3GPP\Extracts\R2-2310202%20Discussion%20on%20QoE%20configuration%20and%20reporting%20for%20NR-DC.docx) Discussion on QoE configuration and reporting for NR-DC China Unicom discussion NR\_QoE\_enh-Core

[R2-2310241](file:///D:\3GPP\Extracts\R2-2310241%20Remaining%20issue%20on%20QoE%20in%20NR-DC.docx) Remaining issues on QoE in NR-DC CMCC discussion Rel-18 NR\_QoE\_enh-Core

[R2-2310449](file:///D:\3GPP\Extracts\R2-2310449%20Discussion%20on%20remaining%20issues%20for%20QoE%20measurements%20for%20NR-DC.docx) Discussion on remaining issues for QoE measurements for NR-DC CATT discussion Rel-18 NR\_QoE\_enh-Core

[R2-2310515](file:///D:\3GPP\Extracts\R2-2310515%20Discussion%20on%20QoE%20measurements%20in%20NR-DC.docx) Discussion on QoE measurements in NR-DC Huawei, HiSilicon discussion Rel-18 NR\_QoE\_enh-Core

[R2-2310655](file:///D:\3GPP\Extracts\R2-2310655%20Remaining%20details%20on%20QoE%20in%20NR-DC.docx) Remaining details on QoE support in NR-DC Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_QoE\_enh-Core

### 7.14.5 UE capabilities and other topics

Including discussion on the continuity of legacy QoE measurement job for streaming and MTSI service during intra-5GC inter-RAT handover process (deprioritized if input from RAN3 is not received during the meeting).

Including any other QoE enhancement discussion (e.g. service type aspects).

Including discussion on UE capability aspects of the QoE WI (e.g. support of MBS QoE and corresponding UE memory size requirements, support of SRB5, support of buffer level threshold based triggering in AS, alignment between AS and AL capabilities, etc.)

**Running CR**

[R2-2310243](file:///D:\3GPP\Extracts\R2-2310243%2038306%20draft%20CR%20for%20Rel-18%20QoE.docx) 38.306 darft CR for Rel-18 QoE CMCC draftCR Rel-18 38.306 17.6.0 B NR\_QoE\_enh-Core

**AS buffer size details**

[R2-2310242](file:///D:\3GPP\Extracts\R2-2310242%20Discussion%20on%20Rel-18%20QoE%20UE%20capabilities.docx) Discussion on Rel-18 QoE UE Capabilities CMCC discussion Rel-18 NR\_QoE\_enh-Core

Proposal 1: In Rel-18, there is no need to specify any additional UE capability for MBS QoE in RRC\_CONNECTED.

Proposal 2: Introduce a mandatory UE capability for UE supports MBS QoE in RRC\_IDLE/RRC\_INACTIVE indicates whether UE supports 128KB buffer.

Proposal 3: Introduce an optional UE capability indicates whether UE supports 256, 512 and 1024KB buffer size.

Proposal 4: Update TS 38.306 CR with modification that AS buffer for MBS QoE in RRC\_IDLE/RRC\_INCATIVE can be shared for paused QoE, Consider the following:

|  |  |
| --- | --- |
| AS layer memory size for QoE measurement reports | For UEs which support *qoe-Streaming-MeasReport-r17*, *qoe-MTSI-MeasReport-r17* or *qoe-VR-MeasReport-r17* but does not support *qoe-IdleIncativeMBS-MeasReport-r18*, it is mandatory to support the minimum AS layer memory size of 64KB for QoE paused measurement reports.  For UE which supports *qoe-IdleIncativeMBS-MeasReport-r18* and any of *qoe-Streaming-MeasReport-r17*, *qoe-MTSI-MeasReport-r17* or *qoe-VR-MeasReport-r17*, it is mandatory to support the minimum AS layer memory size of 128KB for QoE paused and stored measurement reports |

**QoE in IDLE/INACTIVE / MBS capability**

[R2-2310205](file:///D:\3GPP\Extracts\R2-2310205%20Discussion%20on%20Rel-18%20NR%20QoE%20capabilities.docx) Discussion on Rel-18 NR QoE capabilities China Unicom discussion NR\_QoE\_enh-Core

Proposal 2: The capability of supporting MBS QoE in RRC\_IDLE and RRC\_INACTIVE cannot be used for MBS QoE in RRC\_CONNECTED.

Proposal 3: RAN2 does not introduce a new capability to support MBS QoE in RRC\_CONNECTED in Rel-18.

[R2-2310572](file:///D:\3GPP\Extracts\R2-2310572%20Consideration%20on%20Rel-18%20other%20QoE%20enhancement.docx) Consideration on Rel-18 other QoE enhancement ZTE Corporation, Sanechips discussion Rel-18 NR\_QoE\_enh-Core

Proposal 1: Only one UE capability information in the QoE-Parameters to indicate that UE supports QoE for broadcast service in all RRC states.

**NR-DC capabilities**

[R2-2310784](file:///D:\3GPP\Extracts\R2-2310784-UE%20capability%20on%20QoE.docx) Discussion on UE QoE capabilities Qualcomm Incorporated discussion NR\_QoE\_enh-Core

Proposal 1 Introduce UE capability of supporting NR-DC configuration with radio access capability parameter.

Proposal 2 Introduce UE capability of supporting SRB5 for QoE reporting with radio access capability parameters.

[R2-2310656](file:///D:\3GPP\Extracts\R2-2310656%20Inter-RAT%20QoE%20continuity%20and%20UE%20capabilities.docx) Inter-RAT QoE continuity and UE capabilities Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_QoE\_enh-Core [R2-2308235](file:///D:\3GPP\Extracts\R2-2308235%20Inter-RAT%20QoE%20continuity%20and%20UE%20capabilities.docx)

Proposal 7a: A generic UE capability for QoE in DC is supported. This implies the UE can support QoE configuration over SRB1 and QoE reporting over SRB5, and optionally SRB3.

Proposal 7b: SRB5 is conditional mandatory UE feature supported if the UE supports QoE configurations for DC.

**Other issues**

[R2-2310754](file:///D:\3GPP\Extracts\R2-2310754%20-%20Measurement%20status%20issue%20in%20conditional%20handovers%20and%20UE%20capabilities%20for%20QoE.docx) Measurement status issue in conditional handovers and UE capabilities for QoE Ericsson discussion NR\_QoE\_enh-Core

Observation 1 In existing procedures, a target node may end up having incorrect QoE measurement status information at conditional handover.

Proposal 1 Discuss how to resolve the issue that a target node may not have correct measurement status information when a conditional handover is executed.

[R2-2310457](file:///D:\3GPP\Extracts\R2-2310457.doc) Discussion on UE capability for MBS QoE buffer Samsung discussion Rel-18 NR\_QoE\_enh-Core

[R2-2310516](file:///D:\3GPP\Extracts\R2-2310516%20Discussion%20on%20UE%20capabilities%20for%20QoE%20enhancements.docx) Discussion on UE capabilities for QoE enhancements Huawei, HiSilicon discussion Rel-18 NR\_QoE\_enh-Core

[R2-2310557](file:///D:\3GPP\Extracts\R2-2310557%20Discussion%20on%20remaining%20issues%20for%20UE%20capability.docx) Discussion on remaining issues for UE capability CATT discussion Rel-18 NR\_QoE\_enh-Core

## 7.24 TEI18

Specific items may be allocated to a breakout session for treatment.

Time budget: 1 TU

### 7.24.2 TEI proposals by RAN2

Items initiated in RAN2 for NR and LTE.

Tdoc limitation: 1 tdoc, limitation only applicable for non-previously-agreed-to-be-considered TEI proposals.   
proposals that has been agreed or agreed to be considered are not limited by the tdoc limitation.

**MBS – RedCap CFR**

[R2-2309441](file:///D:\3GPP\Extracts\R2-2309441_R3-234735.doc) LS on RedCap UE MBS Broadcast reception (R3-234735; contact: ZTE) RAN3 LS in Rel-18 TEI18 To:SA2 Cc:RAN2

* ?? Noted (RAN2 only in CC)

[R2-2310718](file:///D:\3GPP\Extracts\R2-2310718%20Clarification%20on%20RedCap%20CFR%20configuration%20for%20MBS%20Broadcast.docx) Clarification on RedCap CFR configuration for MBS Broadcast Huawei, HiSilicon discussion Rel-18 NR\_MBS\_enh-Core, NR\_redcap\_enh-Core

[R2-2310719](file:///D:\3GPP\Extracts\R2-2310719%20Correction%20on%20RedCap%20CFR%20configuration.docx) Correction on RedCap CFR configuration Huawei, HiSilicon CR Rel-18 38.331 17.6.0 4343 - F NR\_MBS\_enh-Core, NR\_redcap\_enh-Core

[R2-2311218](file:///D:\3GPP\Extracts\R2-2311218%20Corrections%20on%20RedCap%20CFR%20for%20MBS%20broadcast-v.7.docx) Corrections on RedCap CFR for MBS broadcast Beijing Xiaomi Mobile Software draftCR Rel-17 38.331 17.6.0 F NR\_MBS-Core, NR\_redcap-Core, TEI18

[R2-2311248](file:///D:\3GPP\Extracts\R2-2311248%20Correction-TEI18-RedCap-CFR-for-MBS-broadcast.docx) Further clarification on RedCap CFR for MBS Broadcast [RedCapMBS\_Bcast] Qualcomm Incorporated CR Rel-18 38.331 17.6.0 4388 - B TEI18, NR\_MBS-Core, NR\_redcap-Core

**MBS – PTM retransmission reception with HARQ feedback disabled**

[R2-2309560](file:///D:\3GPP\Extracts\R2-2309560%20Discussion%20on%20PTM%20retransmission%20reception%20by%20UEs%20without%20HARQ%20feedback.docx) Discussion on PTM retransmission reception by UEs without HARQ feedback CATT discussion Rel-18

[R2-2310720](file:///D:\3GPP\Extracts\R2-2310720%20Discussion%20on%20enabling%20PTM%20retransmission%20reception%20by%20UEs%20with%20HARQ%20disabled.docx) Discussion on enabling PTM retransmission reception by UEs with HARQ disabled Huawei, HiSilicon discussion Rel-18 NR\_MBS\_enh-Core

[R2-2310992](file:///D:\3GPP\Extracts\R2-2310992%20PTM%20Retransmission%20CR%20RRC.docx) PTM retransmission reception for multicast DRX with HARQ feedback disabled Nokia, Nokia Shanghai Bell, AT&T, Qualcomm, Samsung, Verizon, Ericsson draftCR Rel-18 38.331 17.6.0 B NR\_MBS-Core, TEI18

[R2-2310993](file:///D:\3GPP\Extracts\R2-2310993%20PTM%20Retransmission%20CR%20MAC.docx) PTM retransmission reception for multicast DRX with HARQ feedback disabled Nokia, Nokia Shanghai Bell, AT&T, Qualcomm, Samsung, Verizon, Ericsson draftCR Rel-18 38.321 17.6.0 B NR\_MBS-Core, TEI18