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](file:///D:\3GPP\Extracts\R2-2311259-MBS-shared_proc_v00_rapp.docx)

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

Added 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: LS available Friday 09:00 (e-mail approval)

* [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](file:///D:\3GPP\Extracts\R2-2309443_R3-234745.docx), 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](file:///D:\3GPP\Extracts\R2-2311401%20%5bDRAFT%5d%20Reply%20LS%20on%20QMC%20support%20in%20RRC_IDLE%20and%20RRC_INACTIVE.doc)

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

Added after Tuesday MBS session:

* [AT123bis][604][eMBS] Questions/LS on capabilities to RAN1 (vivo)

Scope: Agree on the questions we need to ask RAN1 for eMB capabilities and draft a related LS.

Intended outcome: Agreeable LS in R2-2311402

Deadline: LS available Friday 09:00 (e-mail approval)

* [AT123bis][605][eMBS] Session activation/deactivation and state transitions (CATT)

Scope: Solve the FFS points from the online discussion. Discuss P1-P4 from [R2-2311034](file:///D:\3GPP\Extracts\R2-2311034%20notif&state-transitions-rrc-inactive.docx).

Intended outcome: Report in [R2-2311403](file:///D:\3GPP\Extracts\R2-2311403%20Report%20of%20%5bAT123bis%5d%5b605%5d%5beMBS%5d%20Session%20activation%20deactivation%20and%20state%20transitions.docx)

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

* [AT123bis][606][eMBS] MRBs handling (Huawei)

Scope: Continue discussion on P7 and P8 from [R2-2310048](file:///D:\3GPP\Extracts\R2-2310048%20Consideration%20on%20the%20control%20plane%20issue%20for%20multicast%20reception%20in%20RRC_INACTIVE.docx) to understand what is needed for the UE to be able to determine which MRBs to suspend when moving to RRC INACTIVE (e.g. is it done based on MRB ID, TMGI, LCID etc.)

Intended outcome: Report in [R2-2311404](file:///D:\3GPP\Extracts\R2-2311404%20Summary%20of%20%5bAT123bis%5d%5b606%5d%5beMBS%5d%20MRBs%20handling%20(Huawei).docx)

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

* [AT123bis][607][eMBS] PDCP COUNT synchronization details (ZTE)

Scope: Understand how 1-bit indication works with a target to modify the potential agreement in a way making it fully agreeable.

Intended outcome: Report in [R2-2311405](file:///D:\3GPP\Extracts\R2-2311405%20Report%20on%20%5bAT123bis%5d%5b607%5d%5beMBS%5d%20PDCP%20COUNT%20synchronization%20details%20(ZTE).doc)

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

* [AT123bis][608][eMBS] Shared processing (Qualcomm)

Scope: Discuss P3 and P4 from [R2-2311259](file:///D:\3GPP\Extracts\R2-2311259-MBS-shared_proc_v00_rapp.docx), i.e. clarify:

* + - what carrierFreqMBS in the running CR refers to
    - what additional information is required for MII for shared processing compared to parameters already captured in the running CR

Intended outcome: Report in R2-2311406

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

Added after Wednesday online session:

* [AT123bis][609][EUTRA Legacy] Correction on DRX inactivity timer for NB-IOT UE (Xiaomi)

Scope: Agree on the CRs for correction on DRX inactivity timer for NB-IOT UE

Intended outcome: Agreeable CRs in R2-2311540 and R2-2311541

Deadline: CRs available Friday 09:00 (e-mail approval)

Post-meeting e-mail discussions:

Detailed scope for all e-mail discussions on running CRs and open issues:

1. Update the running CR with agreements from the meeting
2. Rapporteur to propose resolutions for straightforward open issues which can already be included in the running CR
3. Get input on stage-3 issues that require further input from companies to make a decision:
   * Focus on stage-3 issues which are better handled via offline, e.g. signaling details, parameter values/ranges, NOT functionality discussion
   * For these issues, the discussion rapporteur submits a report with proposals to the next meeting and input via company Tdocs should be avoided
4. Identify the remaining open issues that need to be solved for WI completion in the next meeting
   * Company Tdocs for the next meeting should focus on these issues

* [Post123bis][610][eMBS] 38.300 CR update and open issues (CMCC)

Scope: Running CR update and open issues

Intended outcome:

* Endorsed running CR
* List of open issues for TS 38.300 in the annex of the CR

Deadline: Medium (two weeks)

* [Post123bis][611][eMBS] 38.331 CR update and open issues (Huawei)

Scope: Running CR update and open issues

Intended outcome:

* Endorsed running CR
* List of open issues for TS 38.331 in the annex of the CR

Deadline: Medium (two weeks)

* [Post123bis][612][eMBS] 38.321 CR update and open issues (Apple)

Scope: Running CR update and open issues

Intended outcome:

* Endorsed running CR
* List of open issues for TS 38.321 in the annex of the CR

Deadline: Medium (two weeks)

* [Post123bis][613][eMBS] 38.323 CR update and open issues (Xiaomi)

Scope: Running CR update and open issues

Intended outcome:

* Endorsed running CR
* List of open issues for TS 38.323 in the annex of the CR

Deadline: Medium (two weeks)

* [Post123bis][614][eMBS] UE capabilities CRs update and open issues (vivo)

Scope: Running CRs update and open issues

Intended outcome:

* Endorsed running CRs
* List of open issues for UE capabilities in the annex of the CR

Deadline: Medium (two weeks)

* [Post123bis][615][eMBS] 38.304 CR (CATT)

Scope: Provide firs 38.304 CR

Intended outcome: Endorsed running CR

Deadline: Medium (two weeks)

* [Post123bis][616][QoE] 38.300 CR update and open issues (China Unicom)

Scope: Running CR update and open issues

Intended outcome:

* Endorsed running CR
* List of open issues for TS 38.300 in the annex of the CR

Deadline: Medium (two weeks)

* [Post123bis][617][QoE] 38.331 CR update and open issues (Ericsson)

Scope: Running CR update and open issues

Intended outcome:

* Endorsed running CR
* List of open issues for TS 38.331 in the annex of the CR

Deadline: Medium (two weeks)

* [Post123bis][618][QoE] 37.340 CR update and open issues (Nokia)

Scope: Running CR update and open issues

Intended outcome:

* Endorsed running CR
* List of open issues for TS 37.340 in the annex of the CR

Deadline: Medium (two weeks)

* [Post123bis][619][QoE] UE capabilities CRs update and open issues (CMCC)

Scope: Running CRs update and open issues

Intended outcome:

* Endorsed running CRs
* List of open issues for UE capabilities in the annex of the CR

Deadline: Medium (two weeks)

## 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

* Revised in [R2-2311407](file:///D:\3GPP\Extracts\R2-2311407%20-%20Editorial%20change%20on%20DRX%20inactivity%20timer%20for%20NB-IOT%20UE-R17%20-%20V1.doc)

[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

* Revised in [R2-2311408](file:///D:\3GPP\Extracts\R2-2311408%20-%20Editorial%20change%20on%20DRX%20inactivity%20timer%20for%20NB-IOT%20UE-R16%20-V1.doc)
* 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.

[R2-2311407](file:///D:\3GPP\Extracts\R2-2311407%20-%20Editorial%20change%20on%20DRX%20inactivity%20timer%20for%20NB-IOT%20UE-R17%20-%20V1.doc) MAC correction on drx-InactivityTimer for eMTC UE Xiaomi, Ericsson CR Rel-17 36.321 17.6.0 1569 1 F NB\_IOTenh4\_LTE\_eMTC6-Core

* Revised in R2-2311541

[R2-2311408](file:///D:\3GPP\Extracts\R2-2311408%20-%20Editorial%20change%20on%20DRX%20inactivity%20timer%20for%20NB-IOT%20UE-R16%20-V1.doc) MAC correction on drx-InactivityTimer for eMTC UE Xiaomi, Ericsson CR Rel-16 36.321 16.8.0 1570 1 F LTE\_eMTC5-Core

* Revised in R2-2311540

DISCUSSION:

* Huawei would not like to break single-TB case. Also indicates this should be captured in MAC rapporteur’s CR.
* Nokia think the intention is OK, but did not check the revised CR. Need more time for that.
* ZTE thinks the original version of the CR was simpler. Would like to check more.
* Nokia and ZTE are OK with the original CR version.
* QCM has some procedural concerns, e.g. why we do not have mirror CR for Rel-17. QCM also did not check the revision. Intent is OK.
* The intent of the CRs is agreed, but companies need more time to check the revision and decide what exact change to adapt.
* [AT123bis][609][EUTRA Legacy] Correction on DRX inactivity timer for NB-IOT UE (Xiaomi)

Scope: Agree on the CRs for correction on DRX inactivity timer for NB-IOT UE

Intended outcome: Agreeable CRs in R2-2311540 and R2-2311541

Deadline: CRs available Friday 09:00 (e-mail approval)

R2-2311540 Correction on *drx-InactivityTimer* for NB-IOT UE Xiaomi, Ericsson CR Rel-16 36.321 16.8.0 1570 2 F NB\_IOTenh3-Core

* The CR is agreed in principle

R2-2311541 Correction on drx-InactivityTimer for NB-IOT UE Xiaomi, Ericsson CR Rel-17 36.321 17.6.0 1569 2 A NB\_IOTenh3-Core

* The CR is agreed in principle

[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

Observation 1: For NB-IoT, the UL HARQ RTT timer length contains the last subframe of PUSCH TX.

Proposal 1: For NB-IoT, correct the UL HARQ RTT timer length when multiple TBs are scheduled to 2 subframes + deltaPDCCH.

DISCUSSION:

* ZTE thinks this was decided by RAN1. Would be OK to remove “+1 subframe” from deltaPDCCH calculation.
* Nokia thinks both proposals are NBC. Nokia is concerned that different UEs may implement differently if we introduce the change.
* QCM thinks that even if there is a misalignment between the UE and NW is not a problem. QCM think the CR is correct, but not sure whether this is essential.
* Ericsson thinks that without this change the UE will monitor PDCCH a bit earlier. If we change this, then eNB may be send PDCCH earlier while the UE is not listening.
* QCM thinks the issue is with end time, not starting time.
* QCM indicates this will lead to some misalignment between RAN1 assumption and RAN2 specifications.
* Ericsson has concerns with the change.
* Chair summary: Companies tend to agree that the behaviour from the CR was the original intention. On the other hand, this is somewhat NBC change and nothing seems broken even with the current specifications. There are also concerns this will lead to misalignment between the UE and the NW.
* Not agreed, can be revisited in the next meeting if the correction turns out not to cause misalignment issue.

## 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

* Noted

**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

* Noted

**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

* All the CRs to be updated and reviewed after the meeting considering new agreements

**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)

Proposal 1: In eMBS, the capability of starting drx-HARQ-RTT-TimerDL-PTM and drx-RetransmissionTimerDL-PTM is per UE, no FDD-TDD DIFF, and no FR1-FR2 DIFF.

Proposal 2: As a baseline, introduce below optional capability for multicast reception in RRC\_INACTIVE, which is indicated to gNB per FeatureSet level.

| ***dynamicMulticastInactive-r18***  Indicates whether the UE supports dynamic scheduling for multicast for PCell comprised of the following functional components:  - Supports group-common PDCCH/PDSCH for multicast with CRC scrambled by G-RNTI in RRC\_INACTIVE;  - Supports group-common PDCCH/PDSCH for multicast with CRC scrambled by multicast MCCH-RNTI;  - Supports CFR configuration for multicast in RRC\_INACTIVE;  - Supports CORESET and common search space configuration for multicast in RRC\_INACTIVE;  - Supports DCI format 4\_1 with CRC scrambled with G-RNTI for multicast in RRC\_INACTIVE;  - Supports DCI format 4\_0 with CRC scrambled with multicast MCCH-RNTI;  - MCCH change notification indication via DCI;  - One G-RNTI per UE is supported for multicast reception in RRC\_INACTIVE;  - Supports {2, 4, 8} times semi-static slot-level repetition for group-common PDSCH for multicast in RRC\_INACTIVE;  - Supports inter-slot TDM between group-common PDSCH for multicast in RRC\_INACTIVE and other PDSCHs, or between multicast MCCH group-common PDSCH and MTCH group-common PDSCH for multicast in RRC\_INACTIVE, or among multicast MCCH group-common PDSCH and MTCH group-common PDSCH for multicast in RRC\_INACTIVE and other PDSCHs in different slots;  - Supports long DRX cycle for MBS multicast reception in RRC\_INACTIVE. | FS | No | N/A | N/A |
| --- | --- | --- | --- | --- |

Proposal 3: RAN2 assumes to support FDMed between multicast MCCH and PBCH in a slot (check with RAN1).

Proposal 4: RAN2 further discusses whether and how to define minimum capability requirements for eMBS regarding RLC and PDCP related capability.

DISCUSSION on P1:

* QCM think we need a capability with signalling for this.
* Nokia would prefer all UEs to support this feature.
* Mediatek is OK with a capability bit.
* Apple asks if this means the network will explicitly enable/disable this feature.
* Huawei thinks there is no need for signalling this. It is an optional config from the NW and the UE may just not start timers. NW does not need this info in advance.
* Samsung thinks it is better for NW to know whether the UE will apply the timers or not, so capability is needed.
* Lenovo agrees with Huawei, it would be easier for the NW to configure commonly for all UEs.
* CATT also prefers not to have capability bit.
* QCM thinks the bit helps for IODT as well.
* Ericsson also prefers this to be mandatory, but is OK with capability bit.
* TD Tech agrees with Huawei and CATT.
* For multicast in INACTIVE, the capability for PTM retransmission reception with HARQ disabled (i.e. starting drx-HARQ-RTT-TimerDL-PTM and drx-RetransmissionTimerDL-PTM) is signalled per UE, no FDD-TDD DIFF, and no FR1-FR2 DIFF.

DISCUSSION on P2:

* Vivo suggests to discuss offline.
* Apple thinks we need to ask for confirmation on some of these to RAN1.
* Vivo indicates this was already agreed, only P3 needs to be checked.

DISCUSSION on P3:

* QCM supports P3.
* Apple thinks we can make an assumption and ask RAN1.
* RAN2 assumes to support FDMed between multicast MCCH and PBCH in a slot (check with RAN1).
* [AT123bis][604][eMBS] Questions/LS on capabilities to RAN1 (vivo)

Scope: Agree on the questions we need to ask RAN1 for eMB capabilities and draft a related LS.

Intended outcome: Agreeable LS in R2-2311402

Deadline: LS available Friday 09:00 (e-mail approval)

R2-2311402 LS on UE Capability of Multicase Reception in RRC\_INACTIVE RAN2 LS out Rel-18 NR\_MBS\_enh-Core To:RAN1

* Revised in R2-2311542

R2-2311542 LS on UE Capability of Multicase Reception in RRC\_INACTIVE RAN2 LS out Rel-18 NR\_MBS\_enh-Core To:RAN1

### 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.

DISCUSSION:

* QCM, Nokia indicate we can simplify P1-P3.
* LGE thinks we need to capture expected UE behaviour in the agreements.
* Nokia wonders about the cell reselection case. CATT clarifies the UE still monitors for Paging, but Nokianis concerned the UE may miss it during reselection.
* Introduce an explicit indication in the multicast MCCH/RRCRelease(i.e., in the IE MBSMulticastConfiguration) for the UE to stop G-RNTI monitoring. It is used for notification triggered by the multicast session deactivation or the temporary no data.
* 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.
* 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.
* 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.
* If the whole Rel-18 multicast related configuration is absent in RRC Release, UE behaves the same as Rel-17 MBS UE.
* 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.

DISCUSSION on P6 and P8:

* MTK asks if we can combine those.
* QCM is OK with P8, but not with P6. QCM thinks the UE can just use the configuraiton received in RRCRelease. CATT clarifies that we previously agreed that PTM configuration can be provided for active session since for non-active it may change.
* Nokia indicates there is no UE requirements for cell selection, it may take some time.
* ZTE thinks we need to discuss whether MCCH is optional or not.

DISCUSSION on P5:

* Ericsson is OK with P5.
* Xiaomi thinks UE does not need to read MCCH until receiving group paging.
* Lenovo thinks group paging is always needed to inform session activation. QCM agrees.
* CATT clarifies the main intention of this proposal is to reduce latency of session monitoring.
* Huawei think P5 is needed, especially for temporary no data case. Huawei thinks in different cells the session activation status can be different for this case.
* LG agrees with P5. Different cells may have different sessions, UE needs to check it with MCCH.
* FFS 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.
* FFS 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 (if present) upon receiving group paging that indicates to allow the multicast reception in RRC\_INACTIVE. FFS if the UE uses the configuration from RRCRelease until having read the one from MCCH
* FFS whether there can be case where MCCH is not present

(offline CATT) to clarify FFS above

* [AT123bis][605][eMBS] Session activation/deactivation and state transitions (CATT)

Scope: Solve the FFS points from the online discussion. Discuss P1-P4 from [R2-2311034](file:///D:\3GPP\Extracts\R2-2311034%20notif&state-transitions-rrc-inactive.docx).

Intended outcome: Report in [R2-2311403](file:///D:\3GPP\Extracts\R2-2311403%20Report%20of%20%5bAT123bis%5d%5b605%5d%5beMBS%5d%20Session%20activation%20deactivation%20and%20state%20transitions.docx)

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

[R2-2311403](file:///D:\3GPP\Extracts\R2-2311403%20Report%20of%20%5bAT123bis%5d%5b605%5d%5beMBS%5d%20Session%20activation%20deactivation%20and%20state%20transitions.docx) Report of [AT123bis][605][eMBS] Session activation/deactivation and state transitions (CATT) CATT Rel-18 NR\_MBS\_enh-Core

Proposal 1: If UE in RRC\_INACTIVE received “the stop of G-RNTI monitoring” indication for the session in the source cell, the UE reads MCCH(if present) in the reselected cell after cell reselection.

Proposal 2a: 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 if UE selects the same cell as on which it received RRCRelease, UE acquires the PTM configuration from MCCH (if present) upon receiving group paging that indicates to allow the multicast reception in RRC\_INACTIVE.

Proposal 2b:UE can use the PTM configuration from RRCRelease until having read the one from MCCH.

Proposal 3: Multicast MCCH can be optionally present for a cell providing multicast reception in RRC\_INACTIVE.We do not optimize for this in RAN2.

* Nokia suggests to add some description of the scenario of when MCCH may not be present.
* Huawei has a similar view with Nokia. We should also add that there is no PTM configuration update.
* If UE in RRC\_INACTIVE received “the stop of G-RNTI monitoring” indication for the session in the source cell, the UE reads MCCH(if present) in the reselected cell after cell reselection.
* If UE receives PTM configuration of multicast session(s) in RRCRelease and “the stop of G-RNTI monitoring” is indicated for all of the the corresponding session(s) and if UE selects the same cell as on which it received RRCRelease, UE acquires the PTM configuration from MCCH (if present) upon receiving group paging that indicates to allow the multicast reception in RRC\_INACTIVE.
* UE can use the PTM configuration from RRCRelease until having read the one from MCCH.
* Multicast MCCH can be optionally present for a cell providing multicast reception in RRC\_INACTIVE. We do not optimize for this in RAN2, e.g. we are targeting a single cell scenario without mobility and without PTM configuration update for optional MCCH.

**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.

DISCUSSION:

* Mediatek thinks we need a filter, otherwise the condition will rarely be met.
* Nokia wonders if there is such a thing as L3 measurement in INACTIVE. Is this about cell reselection measurements?
* Ericsson assumes we speak of measurements from 38.304. Lenovo, vivo agrees.
* Vivo thinks TTT is not needed. Nokia indicates even for reselection we use T\_reselection. Maybe in this case it is not so necessary, but OK to have it.
* NEC does not see ping-pong issue. TTT is not needed. Network can decide whether to release the UE back or not.
* MTK think we can reuse T\_reselection and it can avoid ping-pong issue.
* LGE thinks T\_reselection can be reused and we need to reduce state transitions. There is no additional work for other WGs with T\_reselection.
* Ericsson thinks timer is useful.
* Spreadtrum TTT is not needed. CMCC agrees.
* QCM has no strong view on TTT, slight preference not to have it.
* The RSRP/RSRQ measurement as specified in TS 38.304 are reused (i.e. no new measurements and measurement requirements).
* No TTT is introduced

[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.

* Can be considered in the offline [605]

**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.

DISCUSSION:

* CATT thinks we can clarify the indication is to indicate which MRB and for which session are continued in INACTIVE.
* LGE thinks MRB ID is not needed in INACTIVE. We can use LCID. Nokia agrees.
* Vivo thinks it is better to use TMGI to indicate which session is continued.
* Apple thinks TMGI is SDAP level, here it is about MRB and one session can be mapped to multiple MRBs. Huawei agrees.
* Huawei thinks UE needs to know TMGI to MRB mapping.
* Ericsson thinks MRB ID is not necessary. LCID can be used.

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.

**(offline Huawei on P7 and P8)**

* [AT123bis][606][eMBS] MRBs handling (Huawei)

Scope: Continue discussion on P7 and P8 from [R2-2310048](file:///D:\3GPP\Extracts\R2-2310048%20Consideration%20on%20the%20control%20plane%20issue%20for%20multicast%20reception%20in%20RRC_INACTIVE.docx) to understand what is needed for the UE to be able to determine which MRBs to suspend when moving to RRC INACTIVE (e.g. is it done based on MRB ID, TMGI, LCID etc.)

Intended outcome: Report in [R2-2311404](file:///D:\3GPP\Extracts\R2-2311404%20Summary%20of%20%5bAT123bis%5d%5b606%5d%5beMBS%5d%20MRBs%20handling%20(Huawei).docx)

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

[R2-2311404](file:///D:\3GPP\Extracts\R2-2311404%20Summary%20of%20%5bAT123bis%5d%5b606%5d%5beMBS%5d%20MRBs%20handling%20(Huawei).docx) [AT123bis][606][eMBS] MRBs handling (Huawei) Huawei, Hisilicon discussion Rel-18 NR\_MBS\_enh-Core

MRB continuation

Observation 1: MRBs corresponding to the same session should behave the same. Case 2 is not a valid case.

Proposal 1: All MRBs corresponding to the same multicast session allowed to be received in RRC\_INACTIVE should be continued.

* Ericsson wonders if it is clear what “is allowed” means.
* All MRBs corresponding to the same multicast session to be received in RRC\_INACTIVE should be continued.

MRB ID configuration

Proposal 2: MRB ID is not configured in PTM configuration. FFS if anything is needed.

* CATT would like to change the FFS to “can be revisited if anything is needed”
* MTK indicates the main concern was about service continuity during mobility. Can add clarification this can be ensured by the network.
* Nokia agrees with MTK, but would like to mention this depends on LCID configuration.
* Huawei thinks we cannot agree now about anything more to be captured than the current FFS. QCM agrees.
* MTK does not want to force NW to do anything but just to described the NW can do it (i.e. it is feasible with network implementation).
* ZTE indicates in MCCH there is no MRB ID nor LCID.
* MRB ID is not configured in PTM configuration for multicast in INACTIVE. FFS if anything is needed.

[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.

DISCUSSION mo-Data vs mt-Access:

* ZTE supports mt-Access as it is NW which wants the UE to resume based on the configured threshold. There is no reason to bar the UE.
* MTK prefer mo-Data because it is UE’s aim to send HARQ feedback by going to RRC Connected.
* QCM tends towards ZTE’s reasoning. Samsung also supports ZTE.
* CATT think mo-Data is more suitable.
* Ericsson think even with mt-Access, the network is somewhat in control, but prefer mo-Data.
* LGE slightly prefers mt-Access.
* Huawei has concern about using mt-Access. This is a congestion case, so network needs to be able to still bar some UEs.
* QCM indicates this is per session and even with mt-Access the NW can reject the attempt.
* Vivo indicates that we even did not address group paging congestion issue. Huawei clarifies this is different s paging is NW-initiated.
* 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).
* UE selects '0' as the Access Category when the resumption of the RRC connection is triggered for multicast reception.

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

DISCUSSION:

* Samsung indicates it is similar to Nokia’s proposal, but is more aligned with legacy behaviour
* LG indicates their proposal is simpler compared to other proposals as it is not based on HARQ timing.
* CATT supports proposal from MTK. It will be hard to converge on when to start the timer and would like to avoid complex discussion at this stage.
* Ericsson thinks we need predictable UE behaviour for the feature to be useful. Samsung/Nokia’s proposals are preferable.
* CMCC thinks the behaviour should eb specified.
* Spreadtrum this is optimization, especially for INACTIVE, so MTK’s approach is preferred.
* Vivo thinks we can agree to have k1 configuration included in MCCH/RRCRelease. Would like to capture UE behaviour is some general way.
* ZTE prefers a simple solution and it can be made predictable even for MTK solution as the timers are configured by the network. The monitoring period’s between the UEs may be different, but this is acceptable.
* Apple prefers LG’s or MTK’s solution. Do not want UE to maintain HARQ timing calculation just for this small optimization.
* Nokia is concerned about alignment with RRC Connected UEs. Network should know when INACTIVE UEs are monitoring.
* QCM thinks we need to first decide what the network configures.
* Huawei thinks the NW optionally configures the parameters for the UE. Alignment does not matter so much, there are already cases where the UE monitors, but there is no retransmission.
* Samsung thinks implementation-based solution does not work.
* LG agrees and indicates that at least misalignment issue is avoided with their approach.
* A UE starts the drx-HARQ-RTT-TimerDL-PTM for the corresponding HARQ process in the first symbol after the end of the corresponding multicast transmission.

**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.

DISCUSSION:

* ZTE suggest even simpler solution. ZTE thinks assuming RNA synchronization is inflexible. ZTE would add an indication in the NCL.
* Vivo believes ZTE’s proposal is more complex. Prefers simple approach from Ericsson.
* MTK thinks 1-bit may not be sufficient. Maybe we can just assume COUNT sync in RNA is ensured.
* Huawei thinks Ericsson’s approach works. RNA is problematic because RNA is UE-specific. Network cannot always ensure sync in RNA.
* Lenovo prefers cell list but Ericsson proposal is fine.
* LGE prefers to assume sync in RNA.
* Nokia agrees with P1, but is not sure about assuming sync in RNA.
* Huawei indicates the indication should also be added in MCCH.
* Potential agreement: A 1-bit indication on cell PDCP COUNT synchronization for an MBS service is present with the INACTIVE MRB PTM configuration provided in RRCRelease/MCCH. FFS whether the indication is for RNA or another area.
* Offline ZTE to understand whether there are concerns with the above and clarify how it works in detail
* [AT123bis][607][eMBS] PDCP COUNT synchronization details (ZTE)

Scope: Understand how 1-bit indication works with a target to modify the potential agreement in a way making it fully agreeable.

Intended outcome: Report in [R2-2311405](file:///D:\3GPP\Extracts\R2-2311405%20Report%20on%20%5bAT123bis%5d%5b607%5d%5beMBS%5d%20PDCP%20COUNT%20synchronization%20details%20(ZTE).doc)

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

[R2-2311405](file:///D:\3GPP\Extracts\R2-2311405%20Report%20on%20%5bAT123bis%5d%5b607%5d%5beMBS%5d%20PDCP%20COUNT%20synchronization%20details%20(ZTE).doc) Report on [AT123bis][607][eMBS] PDCP COUNT synchronization details (ZTE), ZTE, Sanechips discussion Rel-18 NR\_MBS\_enh-Core

Offline conclusion:

A 1-bit indication on cell PDCP COUNT synchronization for an MBS service is present with the INACTIVE MRB PTM configuration provided in RRCRelease, and cells in the RNA area are synchronized.

* A 1-bit indication on cell PDCP COUNT synchronization for an MBS service is present with the INACTIVE MRB PTM configuration provided in RRCRelease, and cells in the RNA area are synchronized for PDCP COUNT.

**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](file:///D:\3GPP\Extracts\R2-2311259-MBS-shared_proc_v00_rapp.docx) [Pre123bis][601][eMBS] Summary of 7.11.3 Shared processing Qualcomm Incorporated (rapporteur) discussion Rel-18 NR\_MBS\_enh-Core

[For potentially easy agreements]

Proposal 1: UE initiates the MII reporting for the non-serving cell upon stopping the reception of all the broadcast services that UE were receiving on a non-serving cell (TP in [R2-2309559](file:///D:\3GPP\Extracts\R2-2309559%20Remaining%20Issues%20on%20Shared%20Processing.docx) can be taken as baseline).

Proposal 2: For Rel-18 MII reporting, frequency of interest determination is amended to add a condition that at least one of the MBS sessions is from non-serving cell for the concerned frequency included in SIB21 and/or USD from the non-serving cell (TP in [R2-2310088](file:///D:\3GPP\Extracts\R2-2310088%20Shared%20processing%20for%20broadcast%20and%20unicast%20reception.docx) can be taken as baseline).

[For discussion]

Proposal 3: [Discussion point 1] Clarify further what carrierFreqMBS in the running CR refers to: whether that relates to broadcast gNB’s whole band where MBS service is provided, or only the CFR for broadcast; and further whether that is centre or the absolute start position, taking into account what information can be available in USD.

Proposal 4: [Discussion point 2] Considering the outcome of discussion point 1, what additional information is required for MII for shared processing compared to parameters already captured in the running CR.

DISCUSSION:

* Xiaomi would like to modify P2 a bit.
* Nokia asks the purpose of indication in P1.
* LGE indicates P1 is already covered by specs as this is change of interest. CATT clarifies the intention was to reduce the number of MII updates.
* UE initiates the MII reporting for the non-serving cell upon stopping the reception of all the broadcast services that UE were receiving on a non-serving cell (TP in [R2-2309559](file:///D:\3GPP\Extracts\R2-2309559%20Remaining%20Issues%20on%20Shared%20Processing.docx) can be taken as baseline).
* For Rel-18 MII reporting, frequency of interest determination is amended to add a condition that at least one of the MBS sessions is from non-serving cell for the concerned frequency included in SIB21 from the non-serving cell and/or USD (TP in [R2-2310088](file:///D:\3GPP\Extracts\R2-2310088%20Shared%20processing%20for%20broadcast%20and%20unicast%20reception.docx) can be taken as baseline).
* Offline on P3 and P4 (Qualcomm)
* [AT123bis][608][eMBS] Shared processing (Qualcomm)

Scope: Discuss P3 and P4 from [R2-2311259](file:///D:\3GPP\Extracts\R2-2311259-MBS-shared_proc_v00_rapp.docx), i.e. clarify:

* + - what carrierFreqMBS in the running CR refers to
    - what additional information is required for MII for shared processing compared to parameters already captured in the running CR

Intended outcome: Report in R2-2311406

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

[R2-2311406](file:///D:\3GPP\Extracts\R2-2311406-MBS-shared_proc_v00_rapp.docx) Report of [AT123bis][608][eMBS] Shared processing (Qualcomm) Qualcomm Incorporated discussion Rel-18 NR\_MBS\_enh-Core

Proposal 1: For MII for shared processing, FreqInfoMBS in the running CR refers to the frequency information obtained from the USD or the SIB21 (i.e. same understanding as Rel-17).

Proposal 2: For MII for shared processing, signalling will support optionally reporting CFR location & BW (i.e. actual value of locationAndBandwidthBroadcast-r17 encoded as INTEGER (0..37949)) as well as point A of non-serving cell, i.e. information enough to point to the exact location of CFR, if available at the UE.

* Samsung is OK with P1, but not with P2. CFR BW is sufficient to judge the requirement.
* Xiaomi is OK with the proposed compromise. Nokia is also OK with the proposal, but is not OK with Samsung’s proposal.
* Xiaomi asks if both pointA and location&BW are reported, then does the UE still report frequency?
* For MII for shared processing, *FreqInfoMBS* in the running CR refers to the frequency information obtained from the USD or the SIB21 (i.e. same understanding as Rel-17).
* For MII for shared processing, signalling will support reporting CFR location & BW (i.e. actual value of *locationAndBandwidthBroadcast-r17* encoded as INTEGER (0..37949)) as well as point A of non-serving cell, i.e. information enough to point to the exact location of CFR, if available at the UE. It is an optional IE in MII.

**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

* Noted
* RAN2 confirms RAN3 agreements from this LS, i.e.
  + - For s-based QoE configuration received by MN
      * MN sends the QoE configuration via SRB1
      * QoE reports can be sent via SRB4 or SRB5
    - WA: The transparent reporting for RVQoE over RRC is not supported.
    - Define two different reporting leg indications for QoE and RVQoE.
    - For a UE in NR-DC, each legacy QoE configuration can have only one corresponding RVQoE configuration when needed.
* Huawei think there are some RAN2 impacts from WA from RAN3 LS.
* CATT would like to make it clear whether reporting leg indication for RVQoE is optional or not. Ericsson thinks it should be optional.

[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

* Noted

[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

* Noted

[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

* Noted

[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

* Noted

**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)

* Running CRs to be updated after the meeting via post-meeting e-mail discussions (including 38.300, 37.340, 38.331, UE capabilities (38.306+38.331))

### 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](file:///D:\3GPP\Extracts\R2-2310517%20Discussion%20on%20area%20scope%20handling%20for%20MBS%20QoE.docx):

* 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)
* [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: LS available Friday 09:00 (e-mail approval)

R2-2311400 Reply LS on area scope for QoE measurements RAN2 LS out Rel-18 eQoE To:SA4, SA5 Cc:RAN3

* The LS is approved

**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**
* [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](file:///D:\3GPP\Extracts\R2-2309443_R3-234745.docx), 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](file:///D:\3GPP\Extracts\R2-2311401%20%5bDRAFT%5d%20Reply%20LS%20on%20QMC%20support%20in%20RRC_IDLE%20and%20RRC_INACTIVE.doc)

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

Report from offline [603]

* China Unicom reports that companies agreed to include some issues in the LS.

[R2-2311401](file:///D:\3GPP\Extracts\R2-2311401%20%5bDRAFT%5d%20Reply%20LS%20on%20QMC%20support%20in%20RRC_IDLE%20and%20RRC_INACTIVE.doc) [DRAFT] Reply LS on QMC support in RRC\_IDLE and RRC\_INACTIVE China Unicom LS out Rel-18 eQoE To:RAN3 Cc: SA2, SA5, SA3

* Change “companies agree to transmit the session status indication from UE to gNB when the UE moves to RRC\_CONNECTED state.” to “companies agree to transmit the session status indication from UE to gNB when the UE moves from RRC IDLE/INACTIVE to RRC\_CONNECTED state.”
* After the clean-up, the LS is approved unseen in [R2-2311409](file:///D:\3GPP\Extracts\R2-2311409%20Reply%20LS%20on%20QMC%20support%20in%20RRC_IDLE%20and%20RRC_INACTIVE.doc)

[R2-2311409](file:///D:\3GPP\Extracts\R2-2311409%20Reply%20LS%20on%20QMC%20support%20in%20RRC_IDLE%20and%20RRC_INACTIVE.doc) Reply LS on QMC support in RRC\_IDLE and RRC\_INACTIVE RAN2 LS out Rel-18 eQoE To:RAN3 Cc: SA2, SA5, SA3

* Approved unseen

DISCUSSION

* Ericsson asks about session status, what was agreed in the offline
* Huawei indicate last paragraph in the LS answers the question
* QCM asks if the indication is also for IDLE to CONNECTED. Ericsson thinks it should be for both.
* Session status indication can be transmitted from UE to gNB when the UE moves from RRC IDLE/INACTIVE to RRC\_CONNECTED state. Detailed RRC procedures are FFS in RAN2.

**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 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.

DISCUSISON on “PLMN checking” (P4-P5):

* QCM indicates for MDT this is needed because we have user consent. This was based on SA5 requirement. For QoE we do not have it, so this is not needed.
* Ericsson does not want to mix it with user content. The point is to avoid sending the reports to the wrong operator, e.g. while roaming.
* Huawei agrees this is not about user consent and supports P4 and P5.
* QCM indicates area scope should handle PLMN issue. Ericsson clarifies that area scope is only checked at the beginning of QoE session.
* QCM asks why we did not have this requirement before. Ericsson clarifies there is no issue in RRC CONNECTED but there is an issue in RRC IDLE/INACTIVE.
* Continue offline [CB]
* Report from offline discussions: Ericsson clarifies there is some sympathy from companies for the proposals, but companies would like to check until the next meeting.
* Huawei is OK to postpone, but asks whether we capture this in the open issue list.
* Ericsson thinks this needs to be discussed in the next meeting
* QCM thinks a related issue is whether the UE reports outside area scope. Ericsson thinks this is different, because there is no security issue in the same PLMN case.
* China Unicom thinks this is not an open issue for WI.
* Include this in the open issue list and companies are invited to provide their views for the next meeting

[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

Proposal 14: QoE configurations cannot be released via broadcast.

* QoE configurations cannot be released via broadcast.

[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.

* Qualcomm clarifies they are OK to either activate the SCG or specify that UE discard the report if SCG is not activated.

[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.

DISCUSSION:

* Huawei supports proposal from NEC. The network can move the reporting to the other SRB if it really needs it. Also the P1 from Samsung makes sense.
* Ericsson has a strong concern on the agreement from the previous meeting as it has to be SN to reconfigure the SRB for SN-configured QoE configs. It will lead to many SN reconfigurations. Ericsson would like to agree that for both QoE and RVQoE the UE can request activation of SCG.
* Apple supports P1 from Samsung.
* QCM thinks the NW reconfiguration is not a problem.
* Huawei thinks what Ericsson describes is an overcomplicated network implementation. Ericsson clarifies their point is to make it simpler.
* Chair: Majority of companies think we should agree that UE should not request to activate SCG only for the purpose of RVQoE reporting via SRB5 and that when UE cannot send RVQoE report because the configured RVQoE specific SRB is not available, UE discards the RVQoE report.

Offline (Ericsson) to check whether we need to revert previous agreement on non-requesting SCG activation for QoE and whether we can agree the following:

* ?? UE should not request to activate SCG only for the purpose of RVQoE reporting via SRB5.
* ?? When UE cannot send RVQoE report because the configured RVQoE specific SRB is not available, UE discards the RVQoE report.

[CB] Offline Ericsson

* Report from offline: Ericsson indicates companies were not eager to revert the previous agreement.
* Huawei thinks that companies also thought we can confirm the agreements on not requesting to activate SCG for RVQoE.
* UE should not request to activate SCG only for the purpose of RVQoE reporting via SRB5.
* When UE cannot send RVQoE report because the configured RVQoE specific SRB is not available, UE is not required to buffer 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.

DISCUSSION:

* Huawei thinks that without this indication, we need to rely on the previous flag to control both MN and SN which is not flexible.
* Ericsson thinks general flag is sufficient. If we introduce this flag, then we need to redefine the Rel-17 flag.
* ZTE supports P2 to have more flexibility.
* QCM agrees with Ericsson that a clarification for the old definition would be needed.
* Ericsson asks about the use case. Samsung clarifies that different gNBs may have different preferences or capabilities.
* Introduce a new indicator (ex, rrc-SegAllowed-SN-r17) for NW to inform UE of whether SN allows RRC segmentation via SRB5.
* For Rel-18, clarify that the “segmentation flag” from Rel-17 refers to SRB4 only

**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 4 Wait for RAN3 progress related to whether the UE is indicated which QoE configurations should be released or kept when the SN is released.

* Ericsson just points out that depending on RAN3 progress we may need to revisit our agreement. No action is needed at the moment though.

[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.

* 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.
* 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

* Noted

**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 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 |

DISCUSSION:

* QCM has concern with 128KB for Redcap in particular. So minimum we can keep as 64KB and have additional capabilities. Otherwise we would need separate handling for Redcap and non-Redcap UEs.
* CMCC believes 64KB is too small as also QoE configurations need to be stored.
* Nokia thinks we need to answer the question whether this minimum memory is the same as the one for paused reports or additional?
* China Unicom shares view from CMCC and Nokia. China Unicom thinks this should be additional 64KB so in total it would be 128KB.
* QCM thinks whether it is dedicated or shared should be up to UE implementation.
* Huawei agrees 64KB is too small and slightly prefer having 128KB.
* Samsung indicates this is just minimum capability and UE’s can support more. 64KB as mandatory is sufficient.
* Ericsson would prefer 128KB but understands the concerns from UE vendors.
* QCM has a strong concern with additional requirements for RedCap UEs.
* Intel thinks for Rel-17 there should be no impact on memory of RedCap UEs as there in no bandwidth limitation. So different requirements make sense only for eRedCap (depending on eRedCap type).
* For non-RedCap UE, minimum memory requirement for IDLE/INACTIVE reports is 64KB. This memory is in addition to 64KB used for QoE report storage during pause.
* FFS For RedCap/eRedCap UE, the minimum requirement is 64 KB total for both IDLE/INACTIVE and paused reports
* Introduce an optional UE capability indicates whether UE supports 128, 256, 512 and 1024KB buffer size.

**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.

* ZTE discussed with China Unicom offline and they are OK with their proposals.

DISCUSSION:

* QCM indicates that RAN3 is considering adding delivery mode (e.g. MBS, unicast) in the QoE configuration, so this may impact previous capability.
* Ericsson thinks we need to wait for RAN3.
* Wait for RAN3 conclusion on whether there is some difference for QoE treatment for MBS and unicast

**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 5 Introduce UE capability of supporting NR-DC configuration with radio access capability parameter.

Proposal 6 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.

DISCUSSION:

* Ericsson supports QCM proposal as NW can first want to support NR-DC via SRB4 only.
* Huawei support P7a from Nokia as it simpler. No need for separate SRB5 capability.
* China Unicom supports Nokia proposal. Thinks SRB5 is an integral part of QoE over NR-DC.
* QCM indicates even SRB3 is optional for NR-DC framework today. It may prevent the feature from being implemented if we bind these two.
* Ericsson indicates SRB3 is a separate capability for NR-DC.
* Samsung thinks UEs supporting QOE in NR-DC will most likely support SRB5, but even if not, nothing is broken. Prefers QCM proposal.
* China Unicom thinks the feature is not useful without SRB5 being supported.
* Intel supports QCM proposal.
* Huawei is OK with QCM proposal as a compromise.
* Introduce UE capability of supporting QoE configuration in NR-DC framework with radio access capability parameter.
* Introduce UE capability of supporting SRB5 for QoE reporting with radio access capability parameters.

**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.

* Ericsson indicates the issue is similar as for session status change while the UE is in IDLE/INACTIVE. We could apply the same solution.

DISCUSSION:

* QCM thinks NW based solution could also work. Prefers RAN3 to discuss this first.
* Ericsson thinks there is no message we can use for this purpose.
* Huawei thinks this is Rel-17 issue and agrees with QCM it should be discussed by RAN3.
* Ericsson asks whether we should ask RAN3 to fix it. QCM indicates there are papers on this topic in RAN3, no need to send LS to them.
* RAN2 thinks NW-based solution would be preferred for this issue which can be discussed by RAN3 directly.

[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

[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

* The CR is merged with previously in-principle agreed TEI18 CR on this topic

DISCUSSION on what to do if Redcap BWP does not contain CORESET#0 and initial BWP:

* Option 1: not possible to configure Redcap CFR for MBS broadcast (Xiaomi CR)
* Option 2: CFR can still be CORESET#0 or larger than CORESET#0 (Huawei CR)
* Option 3: CFR for Redcap is CORESET#0 (QCM CR)
* QCM clarifies O2 is not OK, but is OK with both O1 and O3 (preferred).
* Huawei sees not technical issue with O2, signalling allows it already, it should be up to NW implementation. Why do we restrict?
* QCM clarifies that with O2 it is not possible to ensure that search space is contained within 20 MHz BW.
* We go with option 3

**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

Observation 1: It is not essential but an optimization to support PTM retransmission reception by UEs in CONNECTED with HARQ feedback disabled.

Observation 2: If to enable UE in CONNECTED with disabled HARQ feedback to receive the possible PTM retransmission, the only thing to do is to allow NW to configure the HARQ related timers.

Proposal 1: If to support PTM retransmission reception by UEs in CONNECTED with HARQ feedback disabled, UE behaviour is up to UE implementation (i.e., Option 2).

[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

Proposal 1: The NW can optionally configure drx-HARQ-RTT-TimerDL-PTM and drx-RetransmissionTimerDL-PTM to UEs with HARQ disabled and such UEs can start these timers based on implementation if configured.

Proposal 2: PTM retransmission reception for HARQ disabled UEs is an optional capability without signalling.

[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

* Revised in [R2-2311266](file:///D:\3GPP\Extracts\R2-2311266%20PTM%20retransmission%20reception%20for%20multicast%20DRX%20with%20HARQ%20feedback%20disabled.docx)

[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

* Revised in [R2-2311267](file:///D:\3GPP\Extracts\R2-2311267%20PTM%20retransmission%20reception%20for%20multicast%20DRX%20with%20HARQ%20feedback%20disabled.docx)

[R2-2311266](file:///D:\3GPP\Extracts\R2-2311266%20PTM%20retransmission%20reception%20for%20multicast%20DRX%20with%20HARQ%20feedback%20disabled.docx) PTM retransmission reception for multicast DRX with HARQ feedback disabled [PTM\_ReTx\_Mcast\_HARQ\_Disb] Nokia, Nokia Shanghai Bell, AT&T, Qualcomm, Samsung, Verizon, Ericsson draftCR Rel-18 38.331 17.6.0 B NR\_MBS-Core, TEI18

* The CR is agreed in-principle without capability part
* Need code can be checked further (i.e. if it should be changed to “R”)
* Capability part should be moved to a separate draftCR

[R2-2311267](file:///D:\3GPP\Extracts\R2-2311267%20PTM%20retransmission%20reception%20for%20multicast%20DRX%20with%20HARQ%20feedback%20disabled.docx) PTM retransmission reception for multicast DRX with HARQ feedback disabled [PTM\_ReTx\_Mcast\_HARQ\_Disb] Nokia, Nokia Shanghai Bell, AT&T, Qualcomm, Samsung, Verizon, Ericsson draftCR Rel-18 38.321 17.6.0 B NR\_MBS-Core, TEI18

* Postponed

[R2-2311268](file:///D:\3GPP\Extracts\R2-2311268%20PTM%20retransmission%20reception%20for%20multicast%20DRX%20with%20HARQ%20feedback%20disabled.docx) PTM retransmission reception for multicast DRX with HARQ feedback disabled [PTM\_ReTx\_Mcast\_HARQ\_Disb] Nokia, Nokia Shanghai Bell, AT&T, Qualcomm, Samsung, Verizon, Ericsson draftCR Rel-18 38.306 17.6.0 B NR\_MBS-Core, TEI18

* The CR is agreed in-principle
* Dependencies to other features can be further checked
* vivo wonders if there is dependency to other capabilities that should be captured in the field description

DISCUSSION on whether the exact MAC behaviour:

* LG suggests to apply the same DRX handling as we agreed for RRC INACTIVE.
* Nokia thinks this is different as since this is connected we can provide all the required parameters.
* Huawei thinks this scenario is less important than INACTIVE as for Connected HARQ feedback can be enabled if NW thinks reliability needs to be improved. We should not have different solution as this will be too complex.
* QCM thinks for Connected we can reuse the parameters we already have in signalling.
* LGE thinks that the conditions mentioned in Nokia’s CRs cannot be always ensured by the UE.
* Samsung thinks that if NW ensures PUCCH resource is configured, then there is no misunderstanding by the UE.
* ZTE prefers to make it simple and shares concerns from LGE. The current CRs are not clear.
* CATT prefers simple solution, e.g. as agreed for INACTIVE.
* We will allow the UE which is not configured with HARQ feedback to receive PTM retransmissions.
* FFS how we capture the behaviour in MAC specifications

DISCUSSION on whether to have capability signalling:

* MTK, QCM, Samsung thinks capability signalling is needed as this is for RRC Connected.
* Huawei thinks capability signalling is not needed. Even with no capability signalling, there is no interoperability issue.
* ZTE does not think another capability is needed.
* Ericsson agrees capability is needed and think we are repeating the discussion unnecessarily.
* This feature is optional with capability signalling.

# Summary / CB for the main session

The following LS needs to be discussed/approved during the main online session on Friday:

R2-2311542 LS on UE Capability of Multicase Reception in RRC\_INACTIVE RAN2 LS out Rel-18 NR\_MBS\_enh-Core To:RAN1