**3GPP TSG-RAN WG2 Meeting #119bis-e R2-220XXXX**

Online,Oct 10th – Oct 19th, 2022

**Agenda Item:** 6.1.3

**Source:** CATT

**Title:** Summary of offline discussion: [AT119bis-e][602][MBS-R17] Other CP corrections (CATT)

**Document for:** Discussion and decision

# Introduction

This document aims at gathering companies’ views for the following offline discussion:

* [AT119bis-e][602][MBS-R17] Other CP corrections (CATT)

Scope: Treat remaining issues from documents in 6.1.3.

Outcome: Report (CATT) + CR(s) as needed:

* 38.300: Nokia
* 38.304: CATT
* 38.306/38.331 (capabilities): Mediatek

Deadline: Report available: Tuesday 2022-10-18 1000 UTC, agreeable CR(s): EOM

# Discussion

## 304 corrections

### Changes in R2-2209548

Change 1 in R2-2209548

For change 1 in [1], it is about how to handle the co-existence between MBS frequency prioritization and the slice based reselection priorities. The related issue is supposed to be discussed in another offline (i.e. [AT119bis-e][005][NR17] Cell Reselection Frequency Prioritization).So this change is omitted in this discussion.

Change 2 in R2-2209548

For change 2 in [1], for the case UE was configured to receive broadcast on SCell in RRC\_CONNECTED before transiting to RRC\_IDLE or RRC\_INACTIVE state. When transiting to RRC\_IDLE or RRC\_INACTIVE state, UE is expected to camp on the correct frequency (e.g. frequency of the SCell) to continue the broadcast reception. Otherwise, the broadcast reception cannot be continued if UE selects a suitable cell by camping on another frequency that does not support the ongoing broadcast service. To achieve this, the straightforward way maybe by gNB implementation to redirect UE to the correct broadcast frequency upon leaving connected mode.

Therefore it propose to add a NOTE in section 5.2.6 of TS 38.304 for clarification as following,

|  |
| --- |
| When returning to RRC\_IDLE state after UE moved to RRC\_CONNECTED state from *camped on any cell* state, UE shall attempt to camp on an acceptable cell according to *redirectedCarrierInfo*, if included in the *RRCRelease* message. If the UE cannot find an acceptable cell, the UE is allowed to camp on any acceptable cell of the indicated RAT. If the *RRCRelease* message does not contain *redirectedCarrierInfo* UE shall attempt to select an acceptable cell on an NR frequency. If no acceptable cell is found according to the above, the UE not in SNPN Access Mode shall continue to search for an acceptable cell of any PLMN in state *any cell selection*. If no acceptable cell is found according to the above, the UE in SNPN access mode shall continue to search for an acceptable cell of any SNPN in state *any cell selection*.  NOTE y: It is up to NW implementation to redirect UE to the broadcast frequency upon leaving connected mode if UE was configured to receive broadcast on scell in RRC\_CONNECTED. |

**Question 1: Do companies agree** **to add a NOTE in section 5.2.6 of TS 38.304 as below?**

NOTE y: It is up to NW implementation to redirect UE to the broadcast frequency upon leaving connected mode if UE was configured to receive broadcast on scell in RRC\_CONNECTED.

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| MediaTek | See comments | The current proposed wording for the Note may restrict the network behaviour. A possible rewording can be:  Note y: The UE may be redirected to the broadcast frequency upon leaving connected mode if it was configured to receive broadcast on Scell in RRC\_CONNECTED. |
| Xiaomi |  | No strong view. Since this is anyway up to the gNB implementation, it is probably ok to leave it as it is. |

### Change in R2-2210069

In R2-2210069 [3], it is proposed to clarify that UEs expecting multicast session notification for multicast data arrival in RRC\_INACTIVE also need not monitor PEI.

The detailed change to section 5.2.4.1 of TS 38.304 is as the following,

|  |
| --- |
| 7.2.1 Paging Early Indication reception The UE may use Paging Early Indication (PEI) in RRC\_IDLE and RRC\_INACTIVE states in order to reduce power consumption. If PEI configuration is provided in system information, the UE in RRC\_IDLE or RRC\_INACTIVE state supporting PEI (except for the UEs expecting multicast session notification for activation in RRC\_IDLE/ RRC\_INACTIVE or for multicast data arrival in RRC\_INACTIVE) can monitor PEI using PEI parameters in system information according to the procedure described below. |

The rapporteur thinks the proposed change is reasonable as the group notification is used not only for session activation but also for data arrival, according to the description in TS 38.300 as below,

|  |
| --- |
| 16.10.5.2 Configuration  ……  gNBs supporting MBS use a group notification mechanism to notify the UEs in RRC IDLE/INACTIVE state when a multicast session has been activated by the CN or the gNB has multicast session data to deliver |

**Question 2: Do companies agree** **to change “the UEs expecting multicast session activation notification” to “the UEs expecting multicast session notification for activation in RRC\_IDLE/ RRC\_INACTIVE or for multicast data arrival in RRC\_INACTIVE” in section 7.2.1 of TS 38.304?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| MediaTek | Yes |  |
| Xiaomi | Agree with the intention | We propose to make the sentence simpler as follows (i.e. without list all possible trigger conditions for the MBS group notification). The detailed trigger conditions for MBS group notification can be found from 38.300.  The UE may use Paging Early Indication (PEI) in RRC\_IDLE and RRC\_INACTIVE states in order to reduce power consumption. If PEI configuration is provided in system information, the UE in RRC\_IDLE or RRC\_INACTIVE state supporting PEI (except for the UEs expecting MBS group notification) can monitor PEI using PEI parameters in system information according to the procedure described below. |

### Changes in R2-2210131

In R2-2210131 [4], several changes are proposed.

Change 1 in R2-2210131

For change 1 in R2-2210131 [4], it is a correction to format error, i.e., various commas missing after i.e. and e.g.. It is proposed to add it.

The rapporteur thinks these format changes can be accepted directly and the proposed changes can be included in the CR update later, so no need to discuss it.

Change 2 in R2-2210131

For change 2 in [4], a wording change is proposed, i.e. the wording “SIB20 is provided by the cell” is changed to “SIB1 scheduling information of the cell contains SIB20”. The detailed change to section 5.2.4.1 of TS 38.304 is as the following,

|  |
| --- |
| If the MBS broadcast capable UE is receiving or interested to receive an MBS broadcast service, the UE may consider cell reselection candidate frequencies at which it cannot receive the MBS broadcast service to be of the lowest priority during the MBS broadcast session as specified in TS 38.300 [2], as long as the SIB1 scheduling information of the cell contains SIB20 on the MBS frequency which the UE monitors and as long as the condition 2) above is fulfilled for the serving cell. |

The rapporteur thinks the change is reasonable as it is consistent with the previous agreement.

**Question 3: Do companies agree to change “SIB20 is provided by the cell” to “SIB1 scheduling information of the cell contains SIB20” in section 5.2.4.1 of TS 38.304?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| MediaTek | Yes |  |
| Xiaomi | Yes |  |

Change 3 in R2-2210131

For change 3 in [4], it proposes to compress the conditions for broadcast frequency prioritization. The detailed change to section 5.2.4.1 of TS 38.304 is as the following,

|  |
| --- |
| If the MBS broadcast capable UE is receiving or interested to receive an MBS broadcast service(s) and can only receive this MBS broadcast service(s) by camping on a frequency on which it is provided, the UE may consider that frequency to be the highest priority during the MBS broadcast session as specified in TS 38.300 [2] as long as the two following conditions are fulfilled:  1) SIB1 scheduling information of the cell reselected by the UE due to frequency prioritization for MBS contains SIB20;  2) Either:  - One or more MBS FSAI(s) of that frequency is indicated in SIB21 of the serving cell and the same MBS FSAI(s) is also indicated for this MBS broadcast service in MBS User Service Description (USD) as specified in TS 26.346 [20], or  - SIB21 is not provided in the serving cell or SIB21 does not provide the frequency mapping for the concerned service and that frequency is included in the USD of this service, or |

The rapporteur thinks the proposed change seems not essential. As in the current spec, the description is correct and it may be clearer to list different cases in separate sub bullets.

**Question 4: Do companies agree** **to compress the conditions for broadcast frequency prioritization as below?**

- SIB21 is not provided in the serving cell or SIB21 does not provide the frequency mapping for the concerned service and that frequency is included in the USD of this service, or

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| MediaTek | No | Agree with the rapporteur comments on this change |
| Xiaomi | No | Agree with the rapporteur |

### Changes in R2-2210683

In R2-2210683 [5], several changes are proposed.

Change 1 in R2-2210683

For change 1 in [5], it indicates that for cell reselection, MBS broadcast capable UE only allows to consider the frequency which providing MBS broadcast it is interested in as the highest priority when UE can only receive MBS broadcast via PTM as specified in TS 38.300.So it proposes to add "via PTM" after “MBS broadcast service” or “MBS broadcast service(s)” in section 5.2.4.1. The detailed change to section 5.2.4.1 of TS 38.304 is as the following,

|  |
| --- |
| If the MBS broadcast capable UE is receiving or interested to receive an MBS broadcast service(s) via PTM and can only receive this MBS broadcast service(s) via PTM by camping on a frequency on which it is provided, the UE may consider that frequency to be the highest priority during the MBS broadcast session as specified in TS 38.300 [2] as long as the two following conditions are fulfilled:  ….  If the MBS broadcast capable UE is receiving or interested to receive an MBS broadcast service via PTM, the UE may consider cell reselection candidate frequencies on which it cannot receive the MBS broadcast service via PTM to be of the lowest priority during the MBS broadcast session as specified in TS 38.300 [2], |

The rapporteur thinks that it already clear that MBS broadcast services are only provided via PTM according to other RAN2 spec (e.g. 38.300).So it seems not necessary to add “via PTM” after “MBS broadcast service” or “MBS broadcast service(s)”.

**Question 5: Do companies agree to add “via PTM” after “MBS broadcast service” or “MBS broadcast service(s)” in section 5.2.4.1 of TS 38.304?**

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| MediaTek | No | Agree with the rapporteur comments on this change |
| Xiaomi | No | Agree with the rapporteur |

Change 2 in R2-2210683

For change 2 in [5], it is a correction to the grammar error in section 5.2.4.1 of TS 38.304. It proposes to change the preposition "at" to “on” to be consistent across spec when describing on which frequency the MBS broadcast service is received in section 5.2.4.1

The rapporteur thinks the grammar error corrections can be accepted directly and the proposed changes can be included in the CR update later, so no need to discuss it.

Change 3 in R2-2210683

For change 3 in [5], a wording change to "MBS frequency" is proposed. i.e. to change the "MBS frequency" to "frequency" in section 5.2.4.1 of TS 38.304.

The rapporteur thinks using the term “MBS frequency” does not cause any misunderstanding and it is widely used in RAN2 specs (e.g. 38.300, 38.331).So it seems no need to change it.

**Question 6: Do companies agree** **to change "MBS frequency" to "frequency" in section 5.2.4.1 of TS 38.304?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| MediaTek | No | Agree with the rapporteur comments on this change |
| Xiaomi | No | Agree with the rapporteur |

Change 4 in R2-2210683

For change 4 in [5], it proposes to change "Broadcast MRB" to "broadcast MRB" to be consistent with the description of TS 38.331 in section 6.2.

The rapporteur thinks the proposed change is a minor error and can be accepted directly. The proposed changes can be included in the CR update later. So there is no need to discuss it.

Change 5 in R2-2210683

For change 5 in [5], it indicates that the purpose of paging for multicast is not only to notify the session activation, but also to notify UE about the session release. So it proposes to change "session activation" to "session state change" when describing the paging for multicast, the purpose of paging is to notify the multicast session state change in section 6.2. The detailed change to TS 38.304 is as the following,

|  |
| --- |
| 6.2 Reception of MBS  A UE receiving or interested to receive MBS broadcast services shall apply the MCCH information acquisition procedure as specified in TS 38.331 [3] to receive the MCCH information. A UE interested to receive MBS broadcast services identifies if a service that it is interested to receive is started or ongoing by receiving the MCCH information, and then receives a MTCH(s) configured using the broadcast MRB establishment procedure as specified in TS 38.331 [3] and using the DL-SCH reception and MBS broadcast DRX procedure as specified in TS 38.321 [19].  UEs which have joined a multicast session(s) and are in RRC\_IDLE/RRC\_INACTIVE state shall apply the reception of the paging message procedure as specified in TS 38.331 [3] to receive notification of the multicast session state change as specified in TS 23.247 [21]. |

The rapporteur understands there are no RAN2 agreements in R17 MBS to use group paging for notification of session release.

In RAN2#114e, it is agreed to use PCCH for multicast activation notification,

|  |
| --- |
| * Use PCCH for Multicast activation notification (also for MBS supporting nodes). |

And also in section 16.10.5.2 of 38.300, it states that group notification is used to notify the UEs in RRC IDLE/INACTIVE state when a multicast session has been activated by the CN or the gNB has multicast session data to deliver, as below,

|  |
| --- |
| When there is (temporarily) no data to be sent to the UEs for a multicast session, the gNB may move the UE to RRC IDLE/INACTIVE state. gNBs supporting MBS use a group notification mechanism to notify the UEs in RRC IDLE/INACTIVE state when a multicast session has been activated by the CN or the gNB has multicast session data to deliver. |

So the proposed change seems not correct.

**Question 7: Do companies agree** **to change “receive notification of multicast session activation” to “receive notification of multicast session state change” in section 6.2 of TS 38.304?**

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| **Company** | **Yes/No** | **Comments** |
| MediaTek | No | Agree with the rapporteur comments on this change.  This was discussed before when the notification was specified. |
| Xiaomi | No | Agree with the rapporteur |

## Capabilities corrections

### Changes in R2-2209655

In [2], two changes to 38.306 are proposed.

Change 1 in R2-2209655

In change 1 of [2], it indicates that for the below agreement the corresponding description in 38.306 may leads to a misunderstanding that there is at most two split-MRBs configured for multicast, which is not correct and not aligned with the agreements.

|  |
| --- |
| * Reuse the current defined max RB (i.e. 16 RB per UE). Additional note shall be added to TS 38.306 to clarify the max RB is a total number for MRBs and DRBs, and the total number of RBs for split-MRB is considered as two. |

It proposes to clarify that each split-MRB is considered as two RBs for the determination of the maximum number of RBs supported by the UE.

The detailed change to section 8 of TS 38.306 is as the following,

|  |
| --- |
| NOTE 1: For one MAC entity, the maximum number of DRBs configured with PDCP duplication and with RLC entity(ies) associated with this MAC entity is 8.  NOTE 2: In case of CGI reporting, the limit regarding the cells configured includes the cell for which the UE is requested to report CGI i.e. the amount of neighbour cells that can be included is at most (# minCellperMeasObjectRAT - 1), where RAT represents NR and EUTRA.  NOTE 3: This requirement is applicable in NR SA, NR-DC and NE-DC.  NOTE 4: The value of parameter #DRBs defines the total number of multicast MRBs and DRBs, and each split-MRB is counted as two RBs. |

The rapporteur understands the original wording indeed has space for misunderstanding and the proposed change seems clearer.

**Question 8: Do companies agree** **to change NOTE 4 in section 8 of TS 38.306 as below?**

NOTE 4: The value of parameter #DRBs defines the total number of multicast MRBs and DRBs, and each split-MRB is counted as two RBs.

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| MediaTek | No | If we follow the proposal, it means even though the UE only receives one leg of the split MRB, it will be still counted as two RBs, which may be not the intention of the spec following RAN2 previous agreement. |
| Xiaomi | Yes | We think that the proposed change is aligned with the RAN2 agreement that one split MRB is counted as two RBs. |

Change 2 in R2-2209655

For change 2 in [2], it indicates that a previous RAN2#116bis-e agreement was not captured in 38.306.

|  |
| --- |
| * MBS DRX with long DRX cycle is mandatory for multicast capable UEs. |

So it proposes to add in 38.306 that a UE supporting multicast shall indicate support of long DRX cycle capability.

The detailed change to section 4.2.7.5 of TS 38.306 is as the following,

| ***dynamicMulticastPCell-r17***  Indicates whether the UE supports dynamic scheduling for multicast for PCell comprised of the following functional components:  - Supports group-common PDCCH/PDSCH with CRC scrambled by G-RNTI for PCell;  - Supports CFR configuration for multicast;  - Supports CORESET and common search space configuration for multicast;  - Supports DCI format 4\_1 with CRC scrambled with G-RNTI for multicast;  - Supports inter-slot TDM between unicast PDSCH and group-common PDSCH in different slots;  - Supports {2, 4, 8} times semi-static slot-level repetition for group-common PDSCH for multicast.  A UE indicating support of this feature shall support *longDRX-Cycle*. | FS | No | N/A | N/A |
| --- | --- | --- | --- | --- |

**Question 9: Do companies agree to add “A UE indicating support of this feature shall support *longDRX-Cycle*.” in the definition for parameter *dynamicMulticastPCell-r17* in section 4.2.7.5 of TS 38.306?**

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| MediaTek | Yes, with comments | The intention of the proposal is correct. Meanwhile the wording should be improved as following:  A UE supporting this feature shall also indicate the support of *longDRX-Cycle*. |
| Xiaomi | Yes |  |

### Change in R2-2209909

In R2-2209909 [7], it indicates that the components of FG 33-1 (as copied below) are not incorporated into Broadcast capability specified in TS 38.306 clause 5.10. It is proposed to capture those components for completeness.

| Definitions for feature |
| --- |
| **Broadcast reception**  It is optional for UE to support broadcast reception as specified in TS 38.331 [9]. A UE that supports the feature shall also support:  - 4 broadcast MRBs as the minimum number;  - PDCP 12 bits SN;  - ROHC with profiles 0x0000, 0x0001 and 0x0002;  - 8 ROHC context sessions;  - RLC UM with 6 bits SN;  - RLC UM with 12 bits SN;  - DRX with long DRX cycle;  - Group-common PDCCH/PDSCH with CRC scrambled by MCCH-RNTI;  - Group-common PDCCH/PDSCH with CRC scrambled by G-RNTI;  - CFR configuration for broadcast;  - CORESET and common search space for broadcast;  - DCI format 4\_0 with CRC scrambled with G-RNTI/MCCH-RNTI for broadcast;  - Inter-slot TDM between unicast PDSCH and group-common PDSCH in different slots;  - MCCH change notification indication via DCI;  - Higher layer configured slot-level repetition up to 8 for MTCH. |

**Question 10: Do companies agree to capture RAN1 components of FG 33-1 in section 5.10 of TS 38.306?**

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| **Company** | **Yes/No** | **Comments** |
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## 300 correction

### Change in R2-2210711

In R2-2210711 [6], it proposes to clarify in 38.300 that the UE uses the start/stop times in the USD to determine when to start/stop monitor the MCCH. The detailed change to TS 38.300 is as the following,

|  |
| --- |
| 16.10.6.2 Configuration MBS broadcast can be received by UEs in RRC\_IDLE, RRC\_INACTIVE and RRC\_CONNECTED state. A UE can receive the MBS configuration for broadcast session (e.g., parameters needed for MTCH reception) via MCCH in RRC\_IDLE, RRC\_INACTIVE and RRC\_CONNECTED state. The parameters needed for the reception of MCCH are provided via System Information.  The following principles govern the MCCH structure:  - MCCH provides the list of all broadcast services with ongoing sessions transmitted on MTCH(s) and the associated information for broadcast session includes MBS session ID, associated G-RNTI scheduling information and information about neighbouring cells providing certain service on MTCH(s). MCCH content is transmitted within periodically occurring time domain windows, referred to as MCCH transmission window defined by MCCH repetition period, MCCH window duration and radio frame/slot offset;  - MCCH uses a modification period and MCCH contents are only allowed to be modified at each modification period boundary; A notification mechanism is used to announce the change of MCCH contents due to broadcast session start, modification or stop and due to neighbouring cell information modification;  NOTE: The UE uses the start and stop times in the USD to determine when to start monitoring the MCCH for the session the UE is interested in. |

According to current spec, UE starts to monitor MCCH DCI when UE is interested in a broadcast service. The function can work correctly. The rapporteur understands the proposed change is an optimization for UE power consumption.

**Question 11: Do companies agree** **to add a NOTE in section 16.10.6.2 of TS 38.300 as below?**

NOTE: The UE uses the start and stop times in the USD to determine when to start monitoring the MCCH for the session the UE is interested in.

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| **Company** | **Yes/No** | **Comments** |
| MediaTek | No | Too late for Rel-17 to adopt this optimization |
| Xiaomi | No | We think that using “the start and stop times in the USD” is just one input for the UE implementation to determine “when to start monitoring the MCCH”. As the UE implementation could also consider many other aspects, e.g. power consumption, we would suggest not to list them. |

# Conclusion

TBD

# References

[1] R2-2209548 Corrections to TS 38.304 for MBS CATT, CBN CR Rel-17 38.304 17.2.0 0284 - F NR\_MBS-Core Late

[2] R2-2209655 Correction on UE capability for MBS Huawei, CBN, HiSilicon CR Rel-17 38.306 17.2.0 0809 - F NR\_MBS-Core

[3] R2-2210069 Correction to PEI monitoring for group notification Samsung CR Rel-17 38.304 17.2.0 0285 - F NR\_MBS-Core

[4] R2-2210131 Various small corrections to 38.304 Nokia, Nokia Shanghai Bell CR Rel-17 38.331 17.2.0 3525 - F NR\_MBS-Core

[5] R2-2210683 CR to TS 38.304 on NR MBS ZTE, Sanechips CR Rel-17 38.304 17.2.0 0294 - F NR\_MBS-Core

[6] R2-2210711 When to monitor the MCCH on the MBS frequency Ericsson, Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_MBS-Core

[7] R2-2209909 Remaining MBS UE capability open issues Intel Corporation discussion Rel-17 NR\_MBS-Core