3GPP TSG-RAN2 Meeting #121bis-e R2-230xxxx

eMeeting, 17 – 26 April 2023

Agenda Item: 6.2.2 CP corrections

Source: Ericsson

Title: [AT121bis-e][601][MBS-R17] CP issues (Ericsson)

Document for: Discussion and Decision

# Introduction

This report provides a summary of the following offline discussion:

* [AT121bis-e][601][MBS-R17] CP issues (Ericsson)

      Scope: Review Tdocs/CRs submitted to 6.2.2, identify agreeable proposals and CRs for approval.

      Outcome:

* Phase 1: Summary with proposals
* Phase 2: Updated summary and proposals, if needed, (updated) CRs
* Phase 3: CRs ready for approval

      Deadline:

* Phase 1: Deadline for comments: W1 Thursday 0800 UTC
* Phase 2: Deadline for comments: W2 Tuesday 0500 UTC (report available for CB session, if needed)
* Phase 3: Agreeable CRs available EOM

The deadline for providing comments to phase 1 is **Thursday 8th November 08:00 UTC**.

# Contact information

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# Phase 1

## SPS related

[R2-2303919](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303919.zip) **Corrections on MBS SPS configuration** ASUSTeK CR 38.331

Concerning the RAN2 questions about SPS configuration for unicast and multicast RAN1 replied ([R2-2302406](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302406.zip)):

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| ***Q1:*** *RAN2 would like to ask RAN1’s view on whether similar restriction is required when configuring SPS for both unicast and multicast in one BWP, i.e., network cannot use sps-Config to configure unicast SPS and simultaneously use sps-ConfigMulticastToAddModList-r17 to configure multicast in one BWP.* |

***Reply to Q1:*** *Yes, from RAN1’s perspective, the similar restriction is required when configuring SPS for both unicast and multicast in one BWP, i.e., network can only use SPS-ConfigToAddModList-r16 to configure SPS PDSCH for unicast in this case.*

It is proposed to capture in the field description of *sps-Config*:

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| ***sps-Config***UE specific SPS (Semi-Persistent Scheduling) configuration for one BWP. Except for reconfiguration with sync, the NW does not reconfigure *sps-Config* when there is an active configured downlink assignment (see TS 38.321 [3]). However, the NW may release the *sps-Config* at any time. Network can only configure SPS in one BWP using either this field or *sps-ConfigToAddModList.* Network does not configure SPS in one BWP using this field and sps-ConfigMulticastToAddModList-r17 simultaneously. |

NOTE: the 1st change in [R2-2303966](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303966.zip) (see below) is the same as the change proposed in [R2-2303919](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303919.zip).

**Q1**: Do companies agree with the proposed change in [R2-2303919](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303919.zip)?

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| **Company** | **Yes/No** | **Comments** |
| Ericsson | Yes | Use italic for *sps-ConfigMulticastToAddModList-r17* |
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[R2-2303966](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303966.zip) **Miscellabeous RRC corrections for MBS** Huawei, CBN CR 38.331

***2nd change***

The field description of *harq-FeedbackEnablerMulticast* when the IE is absent is misaligned with TS 38.213, according to the RAN1's CR of [R1-2212972](http://www.3gpp.org/ftp//tsg_ran/WG1_RL1/TSGR1_111/Docs//R1-2212972.zip):

When the UE is not provided *harq-FeedbackEnablerMulticast* for a G-RNTI or G-CS-RNTI and *pdsch-HARQ-ACK-Codebook = dynamic* for multicast HARQ-ACK information, the UE does not provide HARQ-ACK information for respective PDSCH receptions.

That means, if HARQ is disabled for some G-RNTIs or G-CS-RNTIs (by not configuring *harq-FeedbackEnablerMulticast*) and enabled for other G-RNTIs or G-CS-RNTIs and semi-static HARQ ACK codebook is used (configured per cell group), the UE should still report HARQ feedback for all G-RNTIs or G-CS-RNTIs to make sure the HARQ codebook size is aligned between UE and gNB.

Besides, in TS38.213, Clause 9.1.2, the following is specified:

*If a Type-1 HARQ-ACK codebook would not include any HARQ-ACK information for transport blocks with enabled HARQ-ACK information, the UE does not provide the Type-1 HARQ-ACK codebook and does not transmit a corresponding PUCCH.*

This is another case that the UE doesn’t provide HARQ feedback when the HARQ feedback is disabled. This should also be added to the field description. For other cases, the UE should provide HARQ feedback even if the HARQ feedback is disabled:

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| ***harq-FeedbackEnablerMulticast***Indicates whether the UE shall provide HARQ feedback for MBS multicast. Value *dci-enabler* means that whether the UE shall provide HARQ feedback for MBS multicast is indicated by DCI as specified in TS 38.213 [13]. Value *enabled* means the UE shall always provide HARQ feedback for MBS multicast. When the field is absent and *pdsch-HARQ-ACK-Codebook* is set to *dynamic*, the UE does not provide HARQ feedback for MBS multicast (see TS 38.213 [13], clause 18). When the field is absent and *pdsch-HARQ-ACK-Codebook* is set to *semi-static*, the UE does not provide HARQ feedback for MBS multicast if the Type-1 HARQ-ACK codebook would not include any HARQ-ACK information for transport blocks with enabled HARQ-ACK information (see TS 38.213 [13], clause 9.1.2). |

**Q2**: Do companies agree with 2nd change in [R2-2303966](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303966.zip)?

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| **Company** | **Yes/No** | **Comments** |
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***3rd change***

CORESET#0 cannot be configured in *SIB1*:

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| ***locationAndBandwidthBroadcast***Indicates starting PRB and the number of PRBs of CFR used for MCCH and MTCH reception.Value *sameAsSib1ConfiguredLocationAndBW* means the CFR for broadcast has the same location and size as the *locationAndBandwidth* for initial BWP configured in SIB1.Value *locationAndBandwidth* is used to configure CFR with bandwidth that is larger than and fully contains the bandwidth for the initial DL BWP configured in SIB1 and CORESET#0.If the field is absent, the CFR for broadcast has the same location and size as CORESET#0. |

**Q3**: Do companies agree with 3rd change in [R2-2303966](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303966.zip)?

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| **Company** | **Yes/No** | **Comments** |
| Ericsson | Yes |  |
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[R2-2302590](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302590.zip) **Correction to PDSCH Aggregation of MBS SPS** vivo CR 38.331

In 38.214 it says:

When receiving PDSCH scheduled by DCI format 4\_1 or 4\_2 for multicast reception in PDCCH with CRC scrambled by G-CS-RNTI, or PDSCH without corresponding PDCCH transmission using associated *SPS-Config* and activated by the DCI format 4\_1 or 4\_2 in PDCCH with CRC scrambled by G-CS-RNTI, the same symbol allocation is applied across the *pdsch-AggregationFactor*, in associated *SPS-Config* if configured, or 1 otherwise, consecutive slots.

In other words, when *pdsch-AggregationFactor* is not configured in *SPS-Config*, then only 1 slot is scheduled for multicast SPS PTM transmission, regardless of *pdsch-AggregationFactor* configured in *pdsch-Config*. However, the current field description of *pdsch-AggregationFactor* in *SPS-Config* mentioned that when the field is absent, the UE applies PDSCH aggregation factor of *pdsch-Config*. The

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| ***pdsch-AggregationFactor***Number of repetitions for SPS PDSCH (see TS 38.214 [19], clause 5.1.2.1). When the field is absent, the UE applies *pdsch-AggregationFactor* in *pdsch-config* which is not used for MBS multicast data or the value 1 for MBS multicast data. |

**Q4**: Do companies agree with the proposed change in [R2-2302590](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302590.zip)?

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| **Company** | **Yes/No** | **Comments** |
| Ericsson | Yes | Perhaps the following wording reads easier?:When the field is absent, the UE applies the value 1 for MBS multicast data and the *pdsch-AggregationFactor* in *pdsch-config* for other data. |
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## SPNP related

[R2-2302522](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302522.zip) **Remaining issues on Supporting MBS in SNPN** CATT, CBN discussion

***1st change***

In RAN2#121 the following agreements were reached:

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| * No explicit NID signaling is added in Uu.
* No explicit NID signaling is added in inter-node message in rel-17.
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Based on above agreement, only *plmn-Index* can be used if the TMGI is to be included in MII and it is for a broadcast service on a SNPN:

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| ***plmn-Index***PLMN index or NPN index according to the *plmn-IdentityInfoList* and *npn-IdentityInfoList* fields included in *SIB1*. If this field is included in the *MRB-ToAddMod-r17*, the UE translates the *plmn-Index* into the PLMN Identity or SNPN Identity based on the configuration in *SIB1* (which is the *SIB1* of the target cell in case of handover). Only plmn-Index(i.e., UE does not use explicitValue) can be used if the corresponding TMGI is to be included in MII and the service belongs to a SNPN. |
| ***serviceId***Uniquely identifies the identity of an MBS service within a PLMN. The field contains octet 3- 5 of the IE Temporary Mobile Group Identity (TMGI) as defined in TS 24.008 [38]. The first octet contains the third octet of the TMGI, the second octet contains the fourth octet of the TMGI and so on. |

**Q5**: Do companies agree with the 1st change proposed in [R2-2302522](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302522.zip)?

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| **Company** | **Yes/No** | **Comments** |
| Ericsson | Yes, with comment | We agree to clarify that *plmn-Index* must be used for SNPNs, but this applies to all messages over Uu interface (*Paging*, *MBSBroadcastConfiguration*, *mrb-ToAddModList* and MII), i.e. we suggest the following simplified wording:The *explicitValue* is not used for MBS service(s) of an SNPN. |
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***2nd change***

In RAN2#121, it is agreed that,

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| * RAN2 specs do not preclude MBS broadcast reception on non-serving SNPNs in Rel-17. This may require update to PLMN index field description in SIB1 (discussed together with PLMN ID indication changes).
* No explicit NID signaling is added in Uu.
* No explicit NID signaling is added in inter-node message in rel-17.
 |

Based on the agreement above, it is possble UE receives MBS broadcast on non-serving SNPNs, so it can report plmn index of non-serving SNPNs in MII message. For PLMN case, it is agreed the PLMN index is replaced by PLMN ID in inter-node message during handover. But for SNPN, it is not possible to replace plmn-index with SNPN ID (i.e., PLMN+NID) in inter-node message as the asn.1 structure does not support it. For TMGI belongs to the serving SNPN, the plmn-index can replaced by PLMN ID and the NID part (i.e. ,the serving NID) can be included in the legacy HO Request message,so the target cell can still format a complete SNPN ID.But for non-serving SNPN,the NID part can not be transferred in inter-node message during handover,So there should be a restriction that the PLMN IDs of these non-serving SNPNs are also not transferred in inter-node message during handover, or it will cause ambiguity in target node.

**Proposal 2: PLMN IDs of non-serving SNPNs are not transferred in MII message contained in inter-node message during handover.**

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| **AS-Context field descriptions** |
| ***mbsInterestIndication***Includes the information last reported by the UE in the NR *MBSInterestIndication* message, where the *plmn-Index* (if included by the UE in *tmgi*) is replaced by the PLMN ID, if needed. For plmn-Index pointing to a non-serving SNPN, the corresponding PLMN ID is not transferred in MII message contained in inter-node message during handover. |

**Q6**: Do companies agree companies agree with the 2nd change proposed in [R2-2302522](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302522.zip)?

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| **Company** | **Yes/No** | **Comments** |
| Ericsson | Yes, with comments | The wording is not explicit whether the *plmn-Index* is sent or not, i.e. more clear to say that such TMGI is removed:A TMGI for which the *plmn-Index* points to a non-serving SNPN is removed from the NR *MBSInterestIndication* message. |
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[R2-2303552](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303552.zip) **Misc correction to TS 38.331 on NR MBS** ZTE, Sanechips CR 38.331

***1st change***

For each session it is indicated via a bitmap which neighbour cells support or do not support the session:

MBSBroadcastConfiguration-r17-IEs ::= SEQUENCE {

 **mbs-SessionInfoList**-r17 MBS-SessionInfoList-r17 OPTIONAL, -- Need R

 mbs-SessionId-r17 TMGI-r17,

 **mtch-NeighbourCell**-r17 BIT STRING (SIZE(maxNeighCellMBS-r17)) OPTIONAL, -- Need S

 …

 **mbs-NeighbourCellList**-r17 MBS-NeighbourCellList-r17 OPTIONAL, -- Need S

 MBS-NeighbourCellList-r17 ::= SEQUENCE (SIZE (0..maxNeighCellMBS-r17)) OF MBS-NeighbourCell-r17

…

The field description for *mtch-neighbourCell* is not complete and even wrong, i.e. the following three use cases are not clearly captured:

1. if the *mbs-NeighbourCellList* is absent, then *mtch-NeighbourCell* shall be absent as well, and UE is not aware of info in neighbour cell;
2. if the *mbs-NeighbourCellList* is empty, then *mtch-NeighbourCell* shall be absent as well, and UE considers the service is not available in any neighbour cell;
3. if a non-empty *mbs-NeighbourCellList* is configured and *mtch-neighbourCell* is absent, UE is not aware of the info in neighbour cell;

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| ***mtch-neighbourCell***Indicates neighbour cells which provide this service on MTCH. The first bit is set to 1 if the service is provided on MTCH in the first cell in *mbs-NeighbourCellList*, otherwise it is set to 0. The second bit is set to 1 if the service is provided on MTCH in the second cell in *mbs-NeighbourCellList*, and so on. If the service is not available in any neighbouring cell and *mbs-NeighbourCellList* is signalled, the network sets all bits in this field to 0. This field shall be absent if the *mbs-NeighbourCellList* is absent, in such case, the related service may or may not be available in any neighbouring cell, i.e. the UE cannot determine the presence or absence of an MBS service in neighbouring cells based on the absence of this field. This field shall be absent if the *mbs-NeighbourCellList* is empty, in such case the related service are not provided in any neighbouring cell. If a *non-empty mbs-NeighbourCellList* is configured and *mtch-neighbourCell* is absent, the related service may or may not be available in any neighbouring cell, i.e. the UE cannot determine the presence or absence of an MBS service in neighbouring cells based on the absence of this field. |

**Q7**: Do companies agree with the 1st proposed change in [R2-2303552](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303552.zip)?

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| **Company** | **Yes/No** | **Comments** |
| Ericsson | Yes, with comments | In our understanding the UE assumes the same for a service when the IE is absent and *mbs-NeighbourCellList* is absent or non-empty. For the case when the IE is absent and *mbs-NeighbourCellList* is empty we propose to use the same wording as in the field description of *mbs-NeighbourCellList* to avoid any confusion:***mtch-neighbourCell***Indicates neighbour cells which provide this service on MTCH. The first bit is set to 1 if the service is provided on MTCH in the first cell in *mbs-NeighbourCellList*, otherwise it is set to 0. The second bit is set to 1 if the service is provided on MTCH in the second cell in *mbs-NeighbourCellList*, and so on. If the service is not available in any neighbouring cell and *mbs-NeighbourCellList* is signalled, the network sets all bits in this field to 0. The field is absent when *mbs-NeighbourCellList* is absent or empty. If this field is absent and *mbs-NeighbourCellList* is absent or non-empty, the related service may or may not be available in any neighbouring cell, i.e. the UE cannot determine the presence or absence of an MBS service in neighbouring cells based on the absence of this field. If this field is absent and *mbs-NeighbourCellList* is empty, then the UE shall assume that MBS broadcast services signalled in *mbs-SessionInfoList* in the *MBSBroadcastConfiguration* message are not provided in any neighbour cell.  |
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***2nd change***

*plmn-Index* shall be clarified for broadcast as well since we have updated it for multicast in RAN2#121. Other than alignment with multicast, such clarification is needed to avoid wrong MII report from UE side:

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| ***plmn-Index***PLMN index or NPN index according to the *plmn-IdentityInfoList* and *npn-IdentityInfoList* fields included in *SIB1*. If this field is included in the *MRB-ToAddMod-r17*, the UE translates the *plmn-Index* into the PLMN Identity or SNPN Identity based on the configuration in *SIB1* (which is the *SIB1* of the target cell in case of handover). If this field is included in the *MBS-SessionInfoList*, the UE translates the *plmn-Index* into the PLMN Identity or SNPN Identity based on the configuration in *SIB1*. If this field is included in the *mbs-ServiceList* in *MBSInterestIndication* message, the UE translates the PLMN Identity or SNPN Identity back to *plmn-Index* based on the configuration in *SIB1;* the source gNB decodes the *MBSInterestIndication*, translates the *plmn-index* to explicit PLMN ID and replaces the plmn-index with the explicit PLMN ID when sending *MBSInterestIndication* to target gNB in case of handover.  |

**Q8**: Do companies agree with the 2nd proposed change in [R2-2303552](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303552.zip)?

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| **Company** | **Yes/No** | **Comments** |
| Ericsson | No, see comments | We do not think these clarifications are needed, i.e. for multicast this was a special case, because the UE is required to store the PLMN/SNPN identity for the handover case. But for broadcast there is no requirement for the UE to store the PLMN/SNPN identity.In [R2-2302522](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_121/Docs//R2-2302522.zip) the *plmn-Index* with SNPNs is clarified. The replacement of *plmn-Index* with PLMN ID is already captured for the *AS-Context* in *HandoverPreparationInformation* message:***mbsInterestIndication***Includes the information last reported by the UE in the NR *MBSInterestIndication* message, where the *plmn-Index* (if included by the UE in *tmgi*) is replaced by the PLMN ID, if needed. |
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## Miscellaneous

[R2-2302523](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302523.zip) **Corrections to TS 38.331**  CATT, CBN CR 38.331

***1st change***

The search space for MCCH, i.e. *searchSpaceMCCH-r17*, is provided in SIB1, but this is not covered in the general description of 5.9.1.1 for the configuration information required by UE to receive MCCH:

**5.9.1.1 General**

UE receiving or interested to receive MBS broadcast service(s) applies MBS broadcast procedures described in this clause as well as the MBS Interest Indication procedure as specified in clause 5.9.4.

MBS broadcast configuration information is provided on MCCH logical channel. MCCH carries the *MBSBroadcastConfiguration* message which indicates the MBS broadcast sessions that are provided in the cell as well as the corresponding scheduling related information for these sessions. Optionally, the *MBSBroadcastConfiguration* message may also contain a list of neighbour cells providing the same broadcast MBS service(s) as provided in the current cell. The configuration information required by the UE to receive MCCH is provided in *SIB1* and *SIB20*. Additionally, System Information provides also an information related to service continuity of MBS broadcast in *SIB21*.

***2nd change***

A cell may provide *SIB20* but it does not always broadcasting *SIB20* as on demand manner is supported for *SIB20*. In the current description of 5.9.2.3, UE decides to acuqire MCCH based on whether *SIB20* is broadcasting in the target cell, but this is not correct since UE should check whether *SIB20* is provided in the scheduling information of *SIB1*:

**5.9.2.3 MCCH information acquisition by the UE**

An MBS capable UE interested to receive or receiving an MBS broadcast service shall:

1> if the procedure is triggered by an MCCH information change notification:

2> start acquiring the *MBSBroadcastConfiguration* message on MCCH in the concerned cell from the slot in which the change notification was received;

1> if the UE enters a cell providing *SIB20*; or

1> if the UE receives *sCellSIB20*:

2> acquire the *MBSBroadcastConfiguration* message on MCCH in the concerned cell at the next repetition period.

***3rd change***

UE should firstly establish the SDAP entity and then receive the DL-SCH for broadcast reception. But in 5.9.3.3, the descrpition of establishing SDAP entity is after the description of receiving DL-SCH, which is not correct:

**5.9.3.3 Broadcast MRB establishment**

Upon a broadcast MRB establishment, the UE shall:

1> if an SDAP entity with the received *mbs-SessionId* does not exist:

2> establish an SDAP entity as specified in TS 37.324 [24] clause 5.1.1.

2> indicate the establishment of the user plane resources for the *mbs-SessionId* to upper layers.

1> establish a PDCP entity and an RLC entity in accordance with *MRB-InfoBroadcast* for this broadcast MRB included in the *MBSBroadcastConfiguration* message and the configuration specified in 9.1.1.7;

1> configure the MAC layer in accordance with the *mtch-SchedulingInfo* (if included);

1> configure the physical layer in accordance with the *mbs-SessionInfoList*, *searchSpaceMTCH,* and *pdsch-ConfigMTCH*, applicable for the broadcast MRB;

1> receive DL-SCH on the cell where the *MBSBroadcastConfiguration* message was received for the established broadcast MRB using *g-RNTI* and *mtch-SchedulingInfo* (if included) in this message for this MBS broadcast service;

**Q9**: Do companies agree with the changes proposed in [R2-2302523](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302523.zip)?

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| **Company** | **Yes/No** | **Comments** |
| Ericsson | Yes to all 3 |  |
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[R2-2302823](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302823.zip) **CP Corrections for MBS** Samsung CR 38.331

According to 5.3.2.3:

If UE is in RRC\_INACTIVE and the UE has joined one or more MBS session(s) indicated by the *TMGI(s)* included in the *pagingGroupList*:

* if none of the *ue-Identity* included in any of the *PagingRecord*, if included in the *Paging* message, matches the UE identity allocated by upper layers
	+ UE initiates the RRC connection resumption procedure

The highlighted text only considers the scenario when paging record(s) are included in paging message. The scenario that there are no paging records in paging message is missing. In this scenario UE behaviour should be same as the case paging records are included but UE identity is not included in any of these paging record.

1> if in RRC\_INACTIVE and the UE has joined one or more MBS session(s) indicated by the *TMGI(s)* included in the *pagingGroupList*, if any, included in the *Paging* message:

2> if none of the *ue-Identity* included in any of the *PagingRecord*, if included in the *Paging* message, matches the UE identity allocated by upper layers; or

2> if *PagingRecord* is not included in the *Paging* message:

3> initiate the RRC connection resumption procedure according to 5.3.13 with *resumeCause* set as below:

4> if the UE is configured by upper layers with Access Identity 1:

5> set *resumeCause* to *mps-PriorityAccess*;

4> else if the UE is configured by upper layers with Access Identity 2:

5> set *resumeCause* to *mcs-PriorityAccess*;

4> else if the UE is configured by upper layers with one or more Access Identities equal to 11-15:

5> set *resumeCause* to *highPriorityAccess*;

4> else:

5> set *resumeCause* to *mt-Access*;

2> else:

3> forward the *TMGI(s)* to the upper layers;

**Q10**: Do companies agree with the proposed changes in [R2-2302823](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302823.zip)?

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Ericsson | Yes, with comments | It is not clear that if any, refers to one or more paging record(s). We propose to say:1> if in RRC\_INACTIVE and the UE has joined one or more MBS session(s) indicated by the *TMGI(s)* included in the *pagingGroupList*, and *PagingRecordlist* is included in the *Paging* message:End add “List” here:2> if *PagingRecordList* is not included in the *Paging* message: |
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[R2-2303031](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303031.zip) **Clarificaition on Key Refresh in MBS** vivo CR 38.331

As both (de)ciphering and integrity protection are not supported for the PDCP associated with a multicast MRB, as a result, key refresh is not needed for either multicast MRB and broadcast MRB (i.e. key refresh is only for SRB or DRB). However, such kind of clarification is missing in the current RRC spec:

RRC reconfiguration to perform reconfiguration with sync includes, but is not limited to, the following cases:

- reconfiguration with sync and security key refresh, involving RA to the PCell/PSCell, MAC reset, refresh of security (for SRBs and DRBs) and re-establishment of RLC and PDCP triggered by explicit indicators;

- reconfiguration with sync but without security key refresh, involving RA to the PCell/PSCell, MAC reset and RLC re-establishment and PDCP data recovery (for AM DRB or AM MRB) triggered by explicit indicators.

- reconfiguration with sync for DAPS and security key refresh, involving RA to the target PCell, establishment of target MAC, and

- for non-DAPS bearer: refresh of security (for SRBs and DRBs) and re-establishment of RLC and PDCP triggered by explicit indicators;

- for DAPS bearer: establishment of RLC for the target PCell, refresh of security and reconfiguration of PDCP to add the ciphering function, the integrity protection function and ROHC function of the target PCell;

- for SRB: refresh of security and establishment of RLC and PDCP for the target PCell;

**Q11**: Do companies agree with the proposed changes in [R2-2303031](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303031.zip)?

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| **Company** | **Yes/No** | **Comments** |
| Ericsson | Yes |  |
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[R2-2303619](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303619.zip) **Corrections for MBS with eDRX and MICO mode** Ericsson CR 38.304

When the UE joins an MBS multicast session when configured by upper layers with eDRX or MICO mode there can be inter-operability issues. When the UE enters RRC\_IDLE the UE may not be reachable for group paging when the session is activated.

The UE can receive MBS broadcast, when the UE is configured by upper layers with eDRX or MICO mode without inter-operability problems, i.e. this can be left to UE implementation.

Proposed changes in 38.304:

**4.1 Overview**

<TEXT OMITTED>

When the UE is in RRC\_IDLE state, upper layers may deactivate AS layer when MICO mode is activated as specified in TS 24.501 [14]. When MICO mode is activated, the AS configuration (e.g. priorities provided by dedicated signalling) is kept and all running timers continue to run but the UE need not perform any idle mode tasks. If a timer expires while MICO mode is activated it is up to the UE implementation whether it performs the corresponding action immediately or the latest when MICO mode is deactivated. When MICO mode is deactivated, the UE shall perform all idle mode tasks.

NOTE: It is up to UE implementation to receive MBS broadcast when MICO mode is activated.

The UE shall not join a multicast session, as specified in TS 24.501 [14], when the UE is configured with MICO mode by upper layers. The UE shall not request MICO mode, as specified in TS 24.501 [14], when the UE has joined a multicast session.

<TEXT OMITTED>

**7.4 Paging in extended DRX**

The UE may be configured by upper layers and/or RRC with an extended DRX (eDRX) cycle TeDRX, CN and/or TeDRX, RAN. The UE operates in eDRX for CN paging in RRC\_IDLE or RRC\_INACTIVE states if the UE is configured for eDRX by upper layers and *eDRX-AllowedIdle* is signalled in SIB1. The UE operates in eDRX for RAN paging in RRC\_INACTIVE state if the UE is configured for eDRX by RAN and *eDRX-Allowed*I*nactive* is signalled in SIB1. If the UE operates in eDRX with an eDRX cycle no longer than 1024 radio frames, it monitors POs as defined in 7.1 with configured eDRX cycle. Otherwise, a UE operating in eDRX monitors POs as defined in 7.1 during a periodic Paging Time Window (PTW) configured for the UE.

NOTE: It is up to UE implementation to receive MBS broadcast when the UE operates in eDRX for CN or RAN paging.

The UE shall not join a multicast session, as specified in TS 24.501 [14], when the UE is configured by upper layers with an extended DRX (eDRX) cycle TeDRX, CN. The UE shall not request eDRX cycle TeDRX, CN, as specified in TS 24.501 [14], when the UE has joined a multicast session.

**Q12**: Do companies agree with the proposed changes in [R2-2303619](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303619.zip)?

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| **Company** | **Yes/No** | **Comments** |
| Ericsson | Yes | This needs to be clarified for the multicast case, because this could otherwise lead to inter-operability issues. The network cannot avoid that the UE joins a multicast session (SMF) when the UE is configured with eDRX/MICO mode (AMF), because this is handled by different CN nodes. Reception of MBS broadcast with eDRX/MICO mode can be left to UE implementation.  |
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## Editorials

[R2-2303127](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303127.zip) **General MBS CR to 38.331** Nokia CR 38.331

Various editorial corrections to the 38.331:

1. Lots of “e.g.” and “i.e.” are missing comma after them.
2. Message text style not using italics

**Q13**: Do companies agree with the proposed change in [R2-2303127](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_121/Docs//R2-2303127.zip)?

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| **Company** | **Yes/No** | **Comments** |
| Ericsson | Yes, with comments | In section 5.3.2.2 it seems that the original text was accidently modified, i.e. already indicated italic *Paging*. And the spelling in 5.9.2.2 is incorrect. |
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[R2-2304170](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304170.zip) **Editorial modification to TS 38.331 on NR MBS** MediaTek CR 38.331

The ENUMERATED value for *mcch-ModificationPeriod-r17* in *SIB20* has an editorial error:

 mcch-ModificationPeriod-r17 ENUMERATED {rf2, rf4, rf8, rf16, rf32, rf64, rf128, rf256,

 rf512, rf1024, rf2048, rf4096, rf8192, rf16384, rf32768, rf65536}

**Q14**: Do companies agree with the proposed change in [R2-2304170](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304170.zip)?

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| **Company** | **Yes/No** | **Comments** |
| Ericsson | Yes, with comment | The used styles are not correct. |
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## For discussion

[R2-2303967](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303967.zip) **Discussion on the remainning MBS issues** Huawei, HiSilicon discussion

**MII reporting during SDT procedure in RRC\_INACTIVE**

Currently in Rel-17, MII reporting is used to inform the network that the UE is receiving or is interested to receive MBS broadcast service(s) in RRC\_CONNECTED state. After receiving the MII, the network will be able to schedule the unicast and broadcast service(s) properly according to UE capability. For example, if the FDM transmission of unicast PDSCH and broadcast GC-PDSCH within a slot is not supported by the UE, the intra-slot FDM scheduling can be avoided, and inter-slot TDM scheduling may be used.

On another hand, SDT has been introduced in Rel-17 for power saving purpose. A UE is allowed to perform transmission of small data/signalling while remaining in RRC\_INACTIVE state. During SDT procedure, the network can schedule subsequent DL transmissions with dynamic DL assignments. However, the MII report is restricted to RRC\_CONNECTED only in the current specification. Hence, the network may not be aware of the MBS services the UE receives during the SDT procedure. This may result in data loss if there is over scheduling exceeding UE capability when MBS broadcast reception and SDT are performed simultaneously. To avoid data loss, MII reporting should be allowed during SDT procedure in RRC\_INACTIVE state. TPs are provided on 38.331 and 38.300.

**Proposal 1: Allow MII reporting during SDT procedure in RRC\_INACTIVE.**

**Q15**: Do companies agree with proposal 1?

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Ericsson | No | This is an optimization and not something critical to fix in Rel-17. |
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**EHC and MBS multicast**

In RAN2#112-e meeting and RAN2#116-e meeting, it was agreed that ROHC and EHC are supported for MBS multicast MRB:

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| --- |
| Agreement* **RoHC (at least U-mode) can be configured for NR MBS bearers. This is applicable for Mcast, assume this is applicable also to broadcast.**
* **EHC is supported for MRB for cases when feedback path is available (UL RLC) and it is expected that no further optimizations are needed.**
 |

However, in current 38.306, the description on corresponding capabilities are missing, i.e. *ehc-r16* and *jointEHC-ROHC-Config-r16*. To make the applicability of these features clear, we propose to add the missing description on multicast MRB to the specification. A TP for TS 38.306 is provided in Annex 3:

4.2.4 PDCP Parameters

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| --- | --- | --- | --- |
| **Definitions for parameters** | **Per** | **M** | **FDD-TDD DIFF** |
| ***ehc-r16***Indicates that the UE supports Ethernet header compression and decompression using EHC protocol, as specified in TS 38.323 [16]. The UE indicating this capability and indicating support for at least one ROHC profile, shall support simultaneous configuration of EHC and ROHC on different DRBs/multicast MRBs. | UE | No | No |
| ***jointEHC-ROHC-Config-r16***Indicates whether the UE supports simultaneous configuration of EHC and ROHC protocols for the same DRB/multicast MRB.  | UE | No | No |

**Proposal 2: Adopt the 38.306 TP in the Annex3 to specify that the *ehc-r16* and *jointEHC-ROHC-Config-r16* are applicable for multicast MRBs.**

**Q16**: Do companies agree with proposal 2 and the proposed corrections?

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Ericsson | Yes, with comment | A normal UE does not support MRB, i.e. we wonder if we should explicitly write:***ehc-r16***Indicates that the UE supports Ethernet header compression and decompression using EHC protocol, as specified in TS 38.323 [16]. The UE indicating this capability and indicating support for at least one ROHC profile, shall support simultaneous configuration of EHC and ROHC on different DRBs.The UE indicating this capability and indicating support for at least one ROHC profile and indicating support of *dynamicMulticastPCell-r17* shall support simultaneous configuration of EHC and ROHC on different DRBs/multicast MRBs.***jointEHC-ROHC-Config-r16***Indicates whether the UE supports simultaneous configuration of EHC and ROHC protocols for the same DRB and for the same multicast MRB when the UE indicates support of *dynamicMulticastPCell-r17*.But perhaps the proposed wording is simpler and clear enough, i.e. no strong view. |
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**PLMN ID in TMGI and PLMN IDs in *SIB1***

According to the current TS 38.331, maximum of 1024 MBS broadcast sessions can be transmitted via broadcast MRB. For each MBS broadcast session, the PLMN ID of the session is indicated within the TMGI. In our view, the PLMN ID indicated in the TMGI for MBS broadcast sessions should be one among the PLMN ID list indicated in SIB1 (i.e.*plmn-IdentityInfoList* within *cellAccessRelatedInfo* ). To avoid ambiguity, we would like RAN2 to confirm this as a common understanding.

|  |
| --- |
| ***CellAccessRelatedInfo* information element**CellAccessRelatedInfo ::= SEQUENCE { plmn-IdentityInfoList PLMN-IdentityInfoList, cellReservedForOtherUse ENUMERATED {true} OPTIONAL, -- Need R ..., [[ cellReservedForFutureUse-r16 ENUMERATED {true} OPTIONAL, -- Need R npn-IdentityInfoList-r16 NPN-IdentityInfoList-r16 OPTIONAL -- Need R ]], [[ snpn-AccessInfoList-r17 SEQUENCE (SIZE (1..maxNPN-r16)) OF SNPN-AccessInfo-r17 OPTIONAL -- Need R ]]}***TMGI* information element**TMGI-r17 ::= SEQUENCE { plmn-Id-r17 CHOICE { plmn-Index INTEGER (1..maxPLMN), explicitValue PLMN-Identity }, serviceId-r17 OCTET STRING (SIZE (3))} |

**Proposal 3: RAN2 confirms that the PLMN ID indicated in the TMGI for MBS broadcast sessions is among the PLMN ID list indicated in SIB1 (i.e. *plmn-IdentityInfoList*).**

**Q17**: Do companies confirm the understanding in proposal 3?

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Ericsson | No, see comments | Strictly speaking this only holds when the *plmn-Index* is used.The UE sends the MII content based on the USD/*SIB21* info, and we are not sure to which extend the USD content is synced with *SIB1* configuration. We also assume that the gNB initiates group paging for TMGIs not included in *SIB1*. Perhaps the TMGIs in *SIB21* and MCCH include only PLMN IDs included in *SIB1*, but this restriction has not been specified.  |
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**MBS broadcast reception on SCell and *plmn-Index* on MCCH**

For broadcast reception on Scell, network sends *SIB20* of Scell via RRC dedicated signalling to UE, and UE receives MCCH message of Scell. However, UE will not obtain SIB1 of Scell. That is to say, UE will not know the relationship between PLMN index and PLMN identity and the relationship between NPN index and NPN identity of Scell. If there are MBS service(s) indicated by *plmn-Index* field in MCCH message of Scell, UE cannot identify TMGI or TMGI+NID of the MBS service(s) included in MCCH message of Scell and cannot determine MTCH configuration of MBS service(s) of interest because the matching of the TMGI or TMGI+NID cannot be performed.

In order to enable UE to receive broadcast on Scell, we propose that network also sends the relationship between PLMN index and PLMN identity and the relationship between NPN index and NPN identity of Scell (e.g., *SIB1* of Scell) when sending the *SIB20* of Scell via RRC dedicated signalling to the UE.

**Proposal 4: Network also sends** **the relationship between PLMN index and PLMN identity and the relationship between NPN index and NPN identity of Scell (e.g., SIB1 of Scell) when sending the SIB20 of Scell via RRC dedicated signalling to the UE.**

**Q18**: Do companies agree with proposal 4, i.e. do companies think that a correction is needed?

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Ericsson | Yes | Not sure about the solution though: the network could send *sCellSIB1* when *plmn-Index* is used in MCCH. But not all *SIB1* info is needed and another IE could be introduced as well. Furthermore Q18 is related to Q19. |
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**MBS broadcast reception on SCell and broadcast CFR and PDSCH configuration of MCCH**

The network can configure the broadcast CFR by indicating that the **broadcast CFR** has the same location and size as the *locationAndBandwidth* for initial BWP configured in *SIB1*. And the network can configure the PDSCH configuration of MCCH by indicating that **PDSCH configuration of MCCH** is the same as PDSCH configuration provided in *initialDownlinkBWP* in *SIB1*.

However, for broadcast reception on Scell, UE will not obtain *SIB1* of Scell. That is to say, UE will not know the location and size for initial BWP configured in *SIB1* of Scell and PDSCH configuration provided in *initialDownlinkBWP* in *SIB1*. In this case, according to the current specification, UE cannot determine the location and size of the broadcast CFR of Scell and the PDSCH configuration of MCCH of Scell, and cannot receive MCCH message of Scell.

In addition, it is worth noting that network will send the location and size for initial BWP and PDSCH configuration provided in *initialDownlinkBWP* via RRC dedicated signalling (i.e., *DownlinkConfigCommon*) to the UE.

In order to enable UE to receive broadcast on Scell, we propose RAN2 to consider the following solutions:

**Proposal 5: For broadcast reception on Scell, RAN2 to consider the following solutions:**

* + **Solution 1:** if proposal 4 is agreed (i.e., network also sends SIB1 of Scell when sending the SIB20 of Scell via RRC dedicated signalling to the UE.), UE determines the broadcast CFR of Scell based on the location and size for initial BWP configured in *SIB1* of Scell, and UE determines the PDSCH configuration of MCCH of Scell based on PDSCH configuration provided in *initialDownlinkBWP* in *SIB1* of Scell.
	+ **Solution 2:** UE determines the broadcast CFR of Scell based on the location and size for initial BWP configured in *DownlinkConfigCommon* of Scell, and UE determines the PDSCH configuration of MCCH of Scell based on PDSCH configuration provided in *initialDownlinkBWP* in *DownlinkConfigCommon* of Scell.
	+ **Solution x:** TBD.

**Q19**: Do companies agree that a correction is needed? Do companies have a preference for a solution?

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| --- | --- | --- | --- |
| **Company** | **Correction needed?** | **Preferred solution** | **Comments** |
| Ericsson | Yes | TBD |  |
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**Proposal 6: RAN2 to delete the unnecessary start condition of drx-HARQ-RTT-TimerDL (i.e., if the first HARQ-ACK reporting mode (i.e. ack-nack) is configured).**

NOTE: Proposal 6 is treated in offline #602:

* [AT121bis-e][602][MBS-R17] Stage-2 and UP issues (Nokia)

# Phase 1 summary and proposals

TBD

# References

1. [R2-2303919](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303919.zip) Corrections on MBS SPS configuration ASUSTeK CR 38.331
2. [R2-2303966](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303966.zip) Miscellabeous RRC corrections for MBS Huawei, CBN CR 38.331
3. [R2-2302590](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302590.zip) Correction to PDSCH Aggregation of MBS SPS vivo CR 38.331
4. [R2-2302522](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302522.zip) Remaining issues on Supporting MBS in SNPN CATT, CBN discussion
5. [R2-2303552](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303552.zip) Misc correction to TS 38.331 on NR MBS ZTE, Sanechips CR 38.331
6. [R2-2302523](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302523.zip) Corrections to TS 38.331 CATT, CBN CR 38.331
7. [R2-2302823](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302823.zip) CP Corrections for MBS Samsung CR 38.331
8. [R2-2303031](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303031.zip) Clarificaition on Key Refresh in MBS vivo CR 38.331
9. [R2-2303619](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303619.zip) Corrections for MBS with eDRX and MICO mode Ericsson CR 38.304
10. [R2-2303127](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303127.zip) General MBS CR to 38.331 Nokia CR 38.331
11. [R2-2304170](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304170.zip) Editorial modification to TS 38.331 on NR MBS MediaTek CR 38.331
12. [R2-2303967](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303967.zip) Discussion on the remainning MBS issues Huawei, HiSilicon discussion