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 20th April 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* |
| Qualcomm | Yes | Agree with Ericsson’s comments. |
| CATT | Yes | Need to align with the RAN1 reply |
| ZTE | Yes | OK to record RAN1 feedback into 331. |
| vivo | Yes | Agree with Ericsson. |
| Samsung | Yes |  |
| Huawei, HiSilicon | Yes |  |
| Nokia | Maybe | No strong view. Change seems OK as such but not critical – Ericsson update is needed if agreed. |
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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** |
| Qualcomm | No | We recognize that not everything that is specified in RAN1 is captured completely in RAN2, but that is ok. The cases when the PHY layer needs to add some bits are specified in RAN1 specs.  Further, the behavior in case of absence as proposed in the last sentence in the CR is still under discussion in RAN1. So, instead of modifying RAN2 spec every time RAN1 changes something, as concluded in last meeting, we should just refer to RAN1 specifications.  If the main argument is that even in case of this field being absent there are cases where HARQ feedback may need to be provided as per RAN1 spec, (and ASN.1 “Need S” needs us to capture something about absence), one option is to update the existing statement as follows, so that we don’t need to come back and fix it again when RAN1 makes more progress.  When the field is absent, the UE ~~does not provide HARQ feedback for MBS multicast (see~~ behavior is specified in TS 38.213 [13], clause 18.~~)~~ |
| CATT | comments | The change is needed, but we agree with QCOM’s view that we can simplify the description by referring to RAN1 spec as much as possible. |
| ZTE | comments | but agree with QC that duplicating RAN1 spec in 331 might not be necessary.  maybe we can follow the normal practice, e.g., as in last RAN2 meeting, simply "referring to 38.213 [13] clause 9.1.2 and 18". |
| vivo | No | The current text with a reference to PHY spec is clear and sufficient. |
| Samsung | No | Reference to TS 38.213 is enough. There is no need to list all the detailed conditions in field description. |
| Huawei, HiSilicon | Yes | Proponent.  We can also accept QC’s suggestion. “clause 18” is not needed in QC’s wording as this may refer to more than one clause:  When the field is absent, the UE ~~does not provide HARQ feedback for MBS multicast (see~~ behavior is specified in TS 38.213 [13]~~, clause 18~~.~~)~~ |
| Nokia | Maybe with changes | As such we are not sure if we should try to capture all these details in RRC – it might be easier to just have reference to 38.213? |
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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 |  |
| Qualcomm | Yes |  |
| CATT | Yes |  |
| ZTE | Yes |  |
| vivo | Yes |  |
| Samsung | Yes |  |
| Huawei, HiSilicon | Yes |  |
| Nokia | Yes | Editorial – do we need to explicitly mention SIB1 even. Could we just remove “configured in SIB1”? |
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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. |
| Qualcomm | Intent ok, see comments | Rewording is needed, e.g. the following: (we should avoid using ‘other data’ and ‘MBS multicast data’.)  When the field is absent, except for MBS multicast the UE applies pdsch-AggregationFactor in pdsch-config, and for MBS multicast the UE applies value 1. |
| CATT | Yes for the intention | The wording from Ericsson is clearer |
| ZTE | Yes and | slightly prefer Ericsson's revised version which is more concise. |
| vivo | Yes | We are fine with Ericsson’s revision. |
| Samsung | Yes | TP from Ericsson seems better. |
| Huawei, HiSilicon | Yes for the intention | On top of Ericsson’ wording, we can change “data” to “transmission”. |
| Nokia | Maybe with changes | Similar wording to what Ericsson proposes looks more correct. The other option could be adding a reference to TS23.214? |
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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. |

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. |
| Qualcomm | Yes, see comment | Intent is ok, but proposed change should be reworded to e.g. “The *explicitValue* is not used if the corresponding TMGI is to be included in MII and the service belongs to a SNPN.” |
| CATT | Yes(proponent) | OK with Ericsson’ suggestion about applying it to all messages over Uu |
| ZTE | Yes and | again, Ericsson's suggestion is a more general and concise description. |
| vivo | Yes | Fine with Ericsson’s revision. |
| Samsung | Yes | Agree with Ericsson’s suggestion. |
| Huawei, HiSilicon | See comments | We think the intention is technically correct and agree with Ericsson that some other messages (except for *mrb-ToAddModList*) should also use plmn-index. For MBS multicast configuration (*mrb-ToAddModList*), the explicitValue can be used as the UE knows its serving NID. So the proposed wording from Ericsson is not 100% accurate. |
| Nokia | No | It is not possible to include explicit SNPN identity in the MII. There does not seem really any possibility that UE could try to do this as there is no ASN.1 supporting this kind of behaviour. Ericsson revision could be acceptable. |
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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 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.  @QC:   * Our understanding is that “if needed” indicates the case when the *Broadcast PLMN Identity Info List NR* IE in the *Served Cell Information NR* IE is included in the XN SETUP REQUEST message and the *plmn-Index* can be used. Perhaps this should be clarified. * Our understanding is that only the serving NID is supported in the NPN Mobility Information, i.e. non-serving SNPNs cannot be signalled. |
| Qualcomm | No, see comments | First, I thought the first (existing) sentence was already intended to be changed to “may be replaced” (instead of ‘is replaced’) as discussed in the last meeting. Somehow this one was missed to be aligned or was out of scope, I am not sure now.  Then, in some cases networks may be able to handle sending even the ‘plmn-index’. How does simply ‘not transferring’ plmn-Index is done and how does it solve the issue? Note: It is not possible to just ‘not include’ neither plmn-index nor explicitValue based on the ASN.1 as plmn-Id-r17 is mandatory inside TMGI-r17.  TMGI-r17 ::= SEQUENCE {  plmn-Id-r17 CHOICE {  plmn-Index INTEGER (1..maxPLMN),  explicitValue PLMN-Identity  },  serviceId-r17 OCTET STRING (SIZE (3))  } |
| CATT | Yes(proponent) | Agree with Ericsson that neither the plmn-index nor the corresponding PLMN ID are to be transferred in MII message contained in inter-node message during handover. |
| ZTE | OK with the intention |  |
| vivo | Comments | Before going into the correction, we need to first clarify whether MII reporting is not supported for the broadcast within non-serving SNPN? |
| Samsung | Yes |  |
| Huawei, HiSilicon | See comments | NW may have different behaviours in different cases:   1. If there is Xn interface established, the target cell will know the PLMN list and NID list of source cell. In this case, the source can transmit the corresponding plmn-index of the non-serving SNPN to the target. However, it seems not useful anyway even the target can get this information as inter-SNPN HO is not supported. 2. If there is no Xn interface established, the source can just drop this TMGI from the MII message to avoid confusion.   In this sense, we think this can be left to gNB implementation. |
| Nokia | No | There is no explicit identity in the MII to be transferred. So how could one provide it even if one wants to? |
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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. |
| Qualcomm | Yes, with comments | Agree with Ericsson’s comments. To align further with the field description of mbs-NeighboourCellList, following rewording is proposed (taking Ericsson’s version as baseline).  ***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 an empty *mbs-NeighbourCellList* is signalled. If this field is absent, ~~and~~ when *mbs-NeighbourCellList* is absent or a non-empty *mbs-NeighbourCellList* is signalled, 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 an empty *mbs-NeighbourCellList* is signalled, the UE shall assume that MBS broadcast services signalled in *mbs-SessionInfoList* in the *MBSBroadcastConfiguration* message are not provided in any neighbour cell.  (for reference)  ***mbs-NeighbourCellList***  List of neighbour cells providing one or more MBS broadcast services via broadcast MRB that are provided by the current cell. This field is used by the UE together with *mtch-NeighbourCell* field signalled for each MBS session in the corresponding *MBS-SessionInfo*. When an empty *mbs-NeighbourCellList*list is signalled, the UE shall assume that MBS broadcast services signalled in *mbs-SessionInfoList* in the *MBSBroadcastConfiguration* message are not provided in any neighbour cell. When a non-empty *mbs-NeighbourCellList* is signalled, the current serving cell does not provide information about MBS broadcast services of a neighbour cell that is not included in *mbs-NeighbourCellList*, i.e., the UE cannot determine the presence or absence of an MBS service of a neighbour cell that is absent. When the field *mbs-NeighbourCellList* is absent, the current serving cell does not provide information about MBS broadcast services in the neighbouring cells, i.e. the UE cannot determine the presence or absence of an MBS service in neighbouring cells based on the absence of this field. |
| CATT | Yes for a,b  No for c | c) is not a valid case in our view.  In our view,If *mbs-NeighbourCellList* is non-empty, *mtch-neighbourCell* should be present. |
| ZTE | Yes (as proponent) | agree with Ericsson's revision, i.e., to align the wording.  agree with Qualcomm comment to make it even more clearer. |
| vivo | No strong view for a,b;  No for c | Agree with CATT. The network configuration will avoid this case (no benefit foreseen). |
| Samsung | Yes, with comments | Prefer TP from Ericsson with one change. Delete “The field is absent when *mbs-NeighbourCellList* is absent or empty.”. The field can be absent irrespective of whether *mbs-NeighbourCellList* is absent or not, empty or non empty*.* |
| Huawei, HiSilicon | Yes but | QC’s wording is also fine with us. |
| Nokia | No | The mtch-neighbourCell field description changes proposed are repeating what is already clear from the existing field descriptions for this field and the mbs-NeighbourCellList field. |
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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:

|  |
| --- |
| ***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)?

|  |  |  |
| --- | --- | --- |
| **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. |
| Qualcomm | No | Similar comment as Ericsson: the gNB part is already captured in specifications, the UE part (i.e. UE translates back to plmn-Index based on the configuration in SIB1) is obvious when UE wants to include plmn-Index. |
| CATT | No | Agree with Ericsson that these clarifications are not necessary. The reason for such translation for multicast is to support delta config during HO, but that is not the case for broadcast. So it seems no need to have such clarification for broadcast. |
| ZTE | Yes (as proponent) | the principle we had agreed in last meeting is, UE locally always store the explicit value, i.e., the index thing is only used for signaling overhead reduction (and in SNPN case it is life-saving.. though). if not, there will be issues as what is broadcast on air in SIB1 may change. it seems there are already different understandings based on above comments.  if majority think this is something obvious, especially from UE vendor or chipset vendor, we are OK. |
| vivo | Comments | We are fine with the intention of the first change:  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;*  This is used for indicating UP resource establishment to the upper layer for a Session marked by TMGI.  The second is not needed as per Ericsson’s comment. |
| Samsung | No | Agree with Ericsson. |
| Huawei, HiSilicon | No | Similar view with companies above that this is not needed. |
| Nokia | No | So we are talking about broadcast – what could be wrong UE behaviour here? There is no way UE would interpret plmn-Index based on some other cell SIB1. So we don’t really see need for this. = we agree with ericsson comment above |
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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 |  |
| Qualcomm | See comment | On the 3rd change, the intent seems ok, however the text should be move only immediately above the “1> receive DL-SCH…” instead of moving all the way to the top. That is because, otherwise the reference to MBSBroadcastConfiguration (which was originally in the first bullet 1>) now moves to the second place, i.e. after the SDAP bullet). |
| CATT | Yes(proponent) | On the 3rd change, the suggested change is OK to us. |
| ZTE | ok with all. |  |
| vivo | Okay only for 1/3. | For 2, the UE can only acquire the broadcast configuration if SIB20 is provided. Nothing is wrong. We fail to see the motivation for this change.  For 3, agree with Qualcomm. |
| Samsung | Yes |  |
| Huawei, HiSilicon | Yes with comments | On the 3rd change, agree with QC’s suggestion. |
| Nokia | Yes to all | regarding 2nd change – word “providing”? Is that clear that it includes the SIB1 scheduling SIB20? We could write bit more long version like in 38.304 if not seen clear like this i.e. SIB1 scheduling information contains SIB20 |
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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: |
| Qualcomm | Intent ok, see comments | The new condition “2> if PagingRecord is not included in the Paging message:” can be the first condition. Then the existing “if included in the Paging message" becomes redundant and can be removed as shown below. Also agree to Ericsson’s comment that “List” is missing in the PagingRecorList.  2> if *PagingRecordList* is not included in the *Paging* message, or  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:  3> initiate the RRC connection resumption procedure… |
| CATT | Yes | On the ambiguity of “if any” mentioned by Ericsson,we understand the intention is to say if pagingGroupList is present in PAGING message,so suggest a rewording as below,  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 pagingGroupList is present: |
| ZTE | OK |  |
| vivo | No | The current text with “if included in the *Paging* message” has covered the meaning. Nothing is wrong. |
| Samsung | Yes | Regarding comments from Ericsson:   * The change ‘If any’ is not related to paging records. *pagingGroupList* may not be included in the paging message. ‘if any’ in the text ‘if any, included in the *Paging* message’ refers to *pagingGroupList*.   Ok for the second change. *PagingRecord 🡪 PagingRecordList* |
| Huawei, HiSilicon | See comments | The 1st change is not needed. There should be no misunderstanding even without it.  On the 2nd change, it looks fine to us. QC’s wording is also OK. |
| Nokia | yes with intention | QC version looks rather OK |
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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 |  |
| Qualcomm | No | While intent is correct, the CR doesn't seem essential since this will be clear from other parts of the specifications. |
| CATT | No | Not essential. It is already clear in 38.323 security(ciphering, integrity protection) is not applied to MRBs |
| ZTE | Maybe not | if AS security does not apply to MRB, then the original wording "refresh of security" does not apply to MRB. |
| vivo | Yes (propoent) |  |
| Samsung | Yes |  |
| Huawei, HiSilicon | No | Same view with QC and CATT. |
| Nokia | Yes | But editorial anyway as clear in 38.323. |
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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. |
| Qualcomm | Ok |  |
| CATT | See comments | For broadcast, no change is needed, it can be up to UE implementation.  For multicast, no need to add the text, we are OK to clarify the UE behaviour in the NOTE,  NOTE: If the UE is interested to receive a multicast session, UE can choose to not request MICO/eDRX via legacy NAS signaling |
| ZTE | comments | the broadcast part, e.g.,  - for section 4.1, "It is up to UE implementation to receive MBS broadcast when MICO mode is activated.", and  - for section 7.4, "It is up to UE implementation to receive MBS broadcast when the UE operates in eDRX for CN or RAN paging."  are not needed, as broadcast reception is a DL only behaviour, and it does not affect MICO mode or eDRX for any paging. |
| vivo | comments | We are fine with the proposed NOTE regarding broadcast reception. For the other part, we propose to have some limitations to NW implementation, e.g. the network shall not release the UE to IDLE/INACTIVE with joining a activated multicst session and configured with eDRX. |
| Samsung | Yes |  |
| Huawei, HiSilicon | See comments | We have similar understanding with CATT and think both broadcast and multicast can be left to UE implementation without spec change. |
| Nokia | No | This can be left to NW implementation – NW may prevent not sending UE to MICO/eDRX if it joins multicast.  In addition, in Rel-18, SA2 had studied and concluded a solution that targets optimizing both scenarios. No need for bringing any restrictions here  CATT proposal could be acceptable. |
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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. |
| Qualcomm | No | Absolutely non-essential edits. This is correctly a Cat D, but if authors are so keen, they can raise this during CR implementation directly to MCC.  In addition, as Ericsson pointed out correctly also, this CR adds more editorial errors (in some cases where the text was already correct)! |
| CATT | Yes | OK to correct it even it is editorial |
| ZTE | no strong view | but share the same view with QC that this can be directly suggested during CR implementation phase. |
| vivo | No strong view |  |
| Samsung | Yes | This purely editorial change should be merged to other CRs. |
| Huawei, HiSilicon | Yes but | Better to be included in a mega CR (improvement needed as indicated by Ericssion). |
| Nokia | Yes (proponent) |  |
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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. |
| Qualcomm | No | Purely editorial Cat D. Could be done by MCC directly during CR implementation or included in RRC rapp CR. No MBS-specific CR is needed. |
| CATT | Yes | OK to correct it even it is editorial |
| ZTE |  | same as above. |
| vivo | Yes |  |
| Samsung | Yes | This purely editorial change should be merged to other CRs. |
| Huawei, HiSilicon | Yes but | Better to be included in a mega CR. |
| Nokia | Yes | agree with Ericsson |
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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. |
| CATT | No | Such optimization is not critical as the co-existence of broadcast reception and SDT should be a rare case. |
| ZTE | No | the purpose of MII is for better scheduling of UE in RRC\_CONNECTED. |
| vivo | No | The NW anyway cannot guarantee service continuity for this INACTIVE UE. No benefit is foreseen. |
| Samsung | No |  |
| Huawei, HiSilicon | Yes | Proponent.  When we specifying MII reporting, SDT is not considered. But later on, RAN2 discussed and agreed SDT can co-exist with MBS. In this case, considering the benefit, it is not logical to restrict that the MII can only be reported in RRC\_CONNECTED. |
| Nokia | No | Agree with Ericsson |
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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. |
| CATT | Yes |  |
| ZTE | Yes |  |
| vivo | Yes | Fine with Ericsson’s revision. |
| Samsung | Yes |  |
| Huawei, HiSilicon | Yes |  |
| Nokia | Yes | We are ok with Ericsson update. |
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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.

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| --- |
| ***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. |
| Qualcomm | No | Agree with Ericsson’s comments.  Also, somewhat relevant but not exactly: RAN2 previously discussed and replied to RAN3 that “From RRC point of view there is no restriction that the TMGIs for the broadcast services that UE is interested to receive or is receiving should contain PLMN ID broadcasted in SIB1”. |
| CATT | No | Such limitation is not aligned with previous agreement, as mentioned by QCOM. |
| ZTE | No | Agree with Ericsson’s comments. |
| vivo | No | NW implementation with PLMN ID can avoid this issue. Nothing is wrong. |
| Samsung | No | We do not see a motivation for this restriction. |
| Huawei, HiSilicon | Yes | Proponent.  In real deployment, the possibility of supporting more PLMNs than broadcast in SIB1 is rather low. In that case, assuming so many PLMNs will add complexity during implementation. |
| Nokia | No | We do not see motivation to have such a limitation specified explicitly. This can be up to NW implementation |
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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. |
| Qualcomm | See comment | The problem seems genuine but not sure about solution though. It seems we should’ve added explicit NID in TMGI anyway as that could have been straightforward for so many workarounds. |
| CATT | Yes with comments | But it seems the correction is a NBC change(i.e., add sCellSIB1 in SCellConfig).not sure if it can be done at this late phase |
| ZTE | comment | same concern as QC, we have done so much for a non NBC change.  still, the unexpected are everywhere ^^.  but if we need a solution, P4 may be the way to go. |
| vivo | Comments | We are fine with the change if it is the majority view. Alternatively, we can clarify that this mentioned case cannot be supported in Rel-17. |
| Samsung | Yes | Scell-Config may need to include the relationship |
| Huawei, HiSilicon | Yes | Proponent.  Without the mapping between plmn-index and explicit ID, the UE wouldn’t know the exact TMGI broadcast on the SCells. And basically, the plmn-index doesn’t work at all. |
| Nokia | No | Regarding PLMN MBS reception one can always use explicit signaling. Then regarding NPN and index usage – same could be avoided by just adding explicit signaling of NPN in TMGI and we have no issues whatsoever. So making this proposed ASN.1 NBC change is not good idea but if we do something then we add explicit identity in the TMGI for all cases. |
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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 |  |
| Qualcomm | No |  | Current spec is not broken. E.g. for the case of SCell, NW can include optional fields locationAndBandwidthBroadcast-r17 (set to explicit locationAndBandwidth) and pdsch-configMCCH-r17.    Solution 1 (adding the whole SIB1 of sCell always in dedicated) is overkill.  Solution 2 is not needed as current spec already supports NW to always include optional value and always include explicit value. So, these changes are not needed. |
| CATT | Yes | TBD |  |
| ZTE | maybe no |  | if as QC suggested, current spec already works. |
| vivo | Comments |  | Same comments as Q18. |
| Samsung | No |  | CFR-ConfigMCCH-MTCH can configure location and bandwidth of CFR. No additional solution seems not needed. |
| Huawei, HiSilicon | Yes | Either is OK as long as the issue is solved | Regarding QC’s comment, we think the current spec cannot support Case A and Case C for CFR.  Note that according to RRC spec:  *“Value locationAndBandwidth is used to configure CFR with bandwidth that is larger than and fully contains the bandwidth for the initial DL BWP and CORESET#0 configured in SIB1.”* |
| Nokia | No |  | UE already has all the relevant information from DownlinkConfigCommon. No need to do anything. |
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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