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**.

The deadline for providing comments in phase 2:

* **phase 1 proposals** before W2 Monday 17:00 UTC
* **phase 2 questions** before W2 Tuesday 05:00 UTC (report available for CB session W2, if needed)
* **updated CR comments** before W2 Tuesday 17:00 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)):

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

|  |  |  |
| --- | --- | --- |
| **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. |
| Sharp | Yes |  |
| MediaTek | Yes | To align with RAN1 LS |
| NEC | Yes | Agree with Ericsson’s comments. |
| LGE | Yes |  |
| Intel | Yes | Agree with Ericsson. |
| Xiaomi | Yes |  |
| Lenovo | Yes |  |

**Summary:**

Most companies (14/15) agree with the proposed change.

**Way forward:**

**Proposal 1**: [R2-2303919](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303919.zip) is in principle agreed with *sps-ConfigMulticastToAddModList-r17* in italic.

[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:

|  |
| --- |
| ***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? |
| Sharp |  | We prefer the wording from QC. |
| MediaTek | No | Agree with Qualcomm’s view |
| NEC | No | The current description is referring to TS 38.213. |
| LGE | No | Similar view as Qualcomm. For the case that the field is absent, it seems better to just refer to the corresponding RAN1 spec. |
| Intel | No | Agree with QC that we can simplify the description by referring to RAN1 spec. |
| Xiaomi | No | Agree with the changes proposed by Qualcomm. |
| Lenovo | comments | Agree with QC to add a reference to RAN1 spec. |

**Summary:**

Most companies (13/14) thinks that these details should not be duplicated in RAN1 specification, but that RAN2 should just refer to 38.213 for the case that the IE is absent. The proponent company thinks this approach is acceptable, but suggests that the specific reference to clause 18 should be removed, because other sections may also be applicable (e.g. clause 9.1.2).

**Way forward:**

**Proposal 2**: The 2nd change in [R2-2303966](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303966.zip) is in principle agreed with the following changes:

|  |
| --- |
| ***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, the UE behavior is specified in TS 38.213 [13]. |

***3rd change***

CORESET#0 cannot be configured in *SIB1*:

|  |
| --- |
| ***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”? |
| Sharp | Yes |  |
| MediaTek | Yes |  |
| NEC | Yes |  |
| LGE | Yes |  |
| Intel | Yes |  |
| Xiaomi | Yes |  |
| Lenovo | Yes |  |

**Summary:**

All companies agreed with the change.

**Way forward:**

**Proposal 3**:Discuss further in phase 2 whether "configured in SIB1“ should be removed from the field description of *locationAndBandwidthBroadcast* .

[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? |
| MediaTek | Yes | Prefer Qualcomm’s correction |
| NEC | Yes | Intention is OK and we share same view with Ericsson as this can be easier to read. |
| LGE | Yes |  |
| Intel | Yes | Ericsson proposal looks better. |
| Xiaomi | Yes | Slightly prefer Ericsson’s proposal. |
| Lenovo | Yes |  |

**Summary:**

All companies (14/14) agreed to make a change. Two companies proposed a different wording. Most companies (9/15) expressed a slight preference for the first re-wording proposal. One company proposed to use“MBS multicast transmission” instead of “MBS multicast data”. But the formet wording is not used in 38.331, while the latter wording is.

**Way forward:**

**Proposal 4**: [R2-2302590](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302590.zip) is in principle agreed with the following change:

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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 the value 1 for MBS multicast data and the *pdsch-AggregationFactor* in *pdsch-config* for other data. |

## 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. |
| MediaTek | Yes | Agree with the intention and the words suggested by Ericsson and Qualcomm |
| NEC | Yes | We need this clarification for NPN scenario and also share same view with above companies. |
| LGE | Yes |  |
| Intel | Yes | Agree with Ericsson’s suggestion. |
| Xiaomi | Yes | Slightly prefer Ericsson’s proposal. |
| Lenovo | Yes |  |

**Summary:**

Most companies (12/14) agreed to make a change.

Two companies proposed a different wording, while most companies preferred the first proposed rewording.

One company indicated that the multicast configuration the explicity value can be used, because the UE knows it serving NID. The rapporteur agrees that this is possible, but thinks that it is beneficial to treat it the same in all cases, and that the *plmn-Index* is good to use because it saves some bits.

**Way forward:**

**Proposal 5**: The 1st change proposed in [R2-2302522](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302522.zip) is in principle agreed with the following change:

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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). The *explicitValue* is not used for MBS service(s) of an SNPN. |

***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? |
| MediaTek | No | It depends on network’s behavior. No need to specify something which is “not transferred”. |
| NEC | Yes | Since it is not possible to replace plmn-index with SNPN ID (i.e., PLMN+NID) in inter-node message. |
| LGE | No | gNB can take different action depending on the information that the gNB has, so it would be better to leave it up to NW implementation. We also wonder if MII is supported for the broadcast of non-serving SNPN. |
| Intel | Yes |  |
| Xiaomi | See comments | We have some sympathy on Huawei’s concerns, and think the network implementation can handle this properly. |
| Lenovo | Yes with the intention |  |

**Summary:**

There was a mixed view whether a clarification is needed, i.e. (7/14) agreed with the change or the intention and the other half did not agree. Four companies (4/14) think that this can be left to NW implementation and does not need to be specified.

It was discussed that the TMGI of the non-serving SNPN should be removed from the list, i.e. the *plmn-Index* only cannot be removed. The *plmn-Index* can be used when Xn is configured and *NPN Broadcast Information* is provided in the setup, but inter-SNPN handover is not supported in Rel-17, i.e. the target cell does not use this information.

The UE may receive MBS broadcast on non-serving SNPNs. And the UE includes TMGIs in the MII message based on UE’s interest and the configuration in USD and *SIB21*. If non-serving SNPN TMGIs are configured then the UE may include them in MII signalling. This MII information can be used to enable MBS broadcast reception in connected mode, but it is not used during connected mode mobility in Rel-17.

The rapporteur thinks that normally the gNB just forwards the octet string unchanged, i.e. if the gN has to remove information then this needs to be specified:

mbsInterestIndication-r17 OCTET STRING (CONTAINING MBSInterestIndication-r17) OPTIONAL

**Way forward:**

**Proposal 6**: Taking into account the feedback and information obtained in phase 1 it is discussed further in phase 2 whether the following change in the field description of *mbsInterestIndication* in AS-Context should be made (or not):

A TMGI for which the *plmn-Index* points to a non-serving SNPN is removed from the NR *MBSInterestIndication* message.

[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;

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

|  |  |  |
| --- | --- | --- |
| **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. |
| MediaTek | Yes with comment | Agree with the description for a and b  For scenario c, we think it means the session is not available in any neighbour cell;  I.e., if a non-empty *mbs-NeighbourCellList* is configured and *mtch-neighbourCell* is absent, UE considers the service is not available in any neighbour cell; |
| NEC | Yes | We are fine to 3 casee raised by ZTE, and case a and c can be merged. |
| LGE | Yes | Agree with QC’s modification.  Regarding c), *mtch-neighbourCell* is per service, so it can be absent though *mbs-NeighbourCellList* is non-empty. |
| Intel | Yes with comments | Agree with CATT that c) is not a valid case. OK with Ericsson or Qualcomm’s improvement, with the modification to remove case c, e.g. “If this field is absent and *mbs-NeighbourCellList* is absent”. |
| Xiaomi | Yes | We are fine with Qualcomm’s revision. |
| Lenovo | Yes but | The intention is correct. But a good NW implementation can provide proper configuration. |

**Summary:**

Most companies (13/14) agreed to make correction. Most companies prefer the rewording proposed by two companies.

1. But some companies (4/14) think that if *mbs-NeighbourCellList* is non-empty then *mtch-neighbourCell* should be present (for each session).
2. One company thinks that “if a non-empty *mbs-NeighbourCellList* is configured and *mtch-neighbourCell* is absent, UE considers the service is not available in any neighbour cell”.

Rapporteur:

1. It is likely that the operator knows for each cell which sessions are supported, and that then based on the neighbour relations, the NCL is constructed. This means that for each session on the serving cell it would be indicated on which neighbour cell(s) this session is also provided (or not), i.e. the IE is present for each session. But the rapporteur is not 100% sure that this will always be the case in practice and we cannot specify what information the NW shall provide in the NCL.
2. The rapporteur thinks that the UE only considers a service not present in any of the neighbour cells in a non-empty NCL, when the bitmap is present with all zeros.

**Way forward:**

**Proposal 7**: The 1st proposed change in [R2-2303552](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303552.zip) is agreed in principle, with the following change:

|  |
| --- |
| ***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, 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, then the UE shall assume that MBS broadcast services signalled in *mbs-SessionInfoList* in the *MBSBroadcastConfiguration* message are not provided in any neighbour cell. |

***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 |
| MediaTek | No | Agree with Ericsson. |
| NEC | No | Agree with Ericsson. |
| LGE | No | The translation of plmn-index is needed only for delta configuration of multicast session. |
| Intel | No | Agree with Ericsson. |
| Xiaomi | No |  |
| Lenovo | No |  |

**Summary:**

Most companies (12/14) think that no corrections are needed. The proponent company is OK if UE vendors have this understanding.

**Way forward:**

**Proposal 8**: The 2nd change in [R2-2303552](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303552.zip) is not agreed.

## 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)?

|  |  |  |
| --- | --- | --- |
| **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 |
| Sharp | Yes |  |
| MediaTek | Yes to all 3 |  |
| NEC | Yes |  |
| LGE | No for 3rd change | For 3rd change, we think that the order of SDAP entity establishment is not important. It is possible to establish an SDAP entity after data reception starts in lower layer. |
| Intel | Yes |  |
| Xiaomi | Yes |  |
| Lenovo | Yes to all |  |

**Summary:**

Most companies (13/14) agree with all three changes, but it is proposed to move the 3rd change above “1> receive DL-SCH…”. Two companies commented the 2nd change.

**Way forward:**

**Proposal 9**: [R2-2302523](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302523.zip) is in principle agreed with the following change:

**5.9.3.3 Broadcast MRB establishment**

Upon a broadcast MRB establishment, the UE shall:

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> 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> 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;

[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)?

|  |  |  |
| --- | --- | --- |
| **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 |
| Sharp |  | We prefer the wording from QC. |
| MediaTek | Yes | Agree with the rewording by Ericsson and QC |
| NEC | Yes with comment | The framework of paging is:  PagingRecordList -> pagingRecord -> UE-ID;  PagingGroupList -> TMGI.  Our understanding is that “if any” here means any one of TMGI that UE has joined. But not sure whether this is needed.  Furthermore, pagingRecord should be replaced with pagingRecordList. |
| LGE | Yes | Support QC’s suggestion. |
| Intel | Yes | OK with Qualcomm’s suggestion. |
| Xiaomi | Yes | We are fine with Qualcomm’s revision. |
| Lenovo | Yes | OK with QC’s proposal. |

**Summary:**

Most companies (14/15) agree that a change is needed. Most companies think that if any, intends to indicate if *pagingGroupList* is present. Companies indicate that the first change it not needed and most companies (9/15) agree with a rewording suggested by two companies.

**Way forward:**

**Proposal 10**: [R2-2302823](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302823.zip) is in principle agreed with the following changes:

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*:

2> if *PagingRecordList* is not included in the *Paging* message; or

2> if none of the *ue-Identity* included in any of the *PagingRecord* matches the UE identity allocated by upper layers:

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;

[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)?

|  |  |  |
| --- | --- | --- |
| **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. |
| Sharp | No | We understand that it was already mentioned in TS38.323. |
| MediaTek | Yes | OK to clarify, or we can say “except MRBs”? |
| NEC | No strong view |  |
| LGE | No | We think that the change is not needed. Reconfiguration with sync but without security key refresh is also included. |
| Intel | Maybe no | Not essential to mention such details in RRC. |
| Xiaomi | Yes | Agree with the intention. We can just exclude MRB in the procedural text. |
| Lenovo | No strong view |  |

**Summary:**

There are different views whether this correction is needed:

* 6: yes
* 2: no strong view
* 2: maybe no
* 5: no

Some companies indicate that this is already clarified in 38.323:

The ciphering and deciphering are not applied to MRBs and sidelink SRB4.

The rapporteur points out that in 38.331 there are other places that clarify that ciphering and integrity protection is only used for DRBs:

NOTE 1: Ciphering and integrity protection are optional to configure for the DRBs.

NOTE 5: Ciphering and integrity protection can be enabled or disabled for a DRB. The enabling/disabling of ciphering or integrity protection can be changed only by releasing and adding the DRB.

**Way forward:**

**Proposal 11**: [R2-2303031](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303031.zip) is not agreed.

[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)?

|  |  |  |
| --- | --- | --- |
| **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. |
| Sharp | Yes |  |
| MediaTek | Yes | Agree with the intention |
| NEC | Yes with comment | Yes only for NOTEs. |
| Intel | Yes |  |
| Xiaomi | No | Agree with Nokia that the network implementation should avoid sending the UE to MICO/eDRX. |
| Lenovo | See comments | We tend to agree with CATT’s comments. |

**Summary:**

Companies provided separate comments for broadcast and multicast:

**MBS broadcast and eDRX/MICO**

* Half of the companies (7/14) that this can be clarified with a NOTE.
* The other half thinks that no clarification is needed, because this can be left to UE implementation without any inter-operability issues.

**MBS multicast and eDRX/MICO**

* Six companies (6/14) agree to capture this UE requirement.
* Four companies (4/14) think that this can be left to UE implementation (and perhaps clarified in a NOTE).
* Three companies (3/15) think that the NW should handle this, i.e. the UE is not released when it has joined a multicast session and the UE is configured with eDRX or MICO mode.
* One company (1/15) did not expres an opinion about the multicast case.

**Rapporteur:**

* Given that for broadcast there is no clear majority, but also no inter-operability issue, the rapporteur proposes that no clarifications for broadcast are agreed.
* For multicast there are different views whether UE or NW should solve this. And if the UE solves this, whether this is mandatory or optional for the UE. The rapporteur thinks that both UE and NW solution are feasible, but that a NOTE for the UE solution is not acceptable, because it may still lead to inter-operability issues.

**Way forward:**

**Proposal 12a**: MBS broadcast reception when the UE is configured with eDRX or MICO mode is left to UE implementation and not further clarified.

**Proposal 12b**: For MBS multicast two options are further discussed in phase 2 with the following two options as a baseline:

1. Clarification for MBS multicast as proposed in [R2-2303619](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303619.zip).
2. It is left to NW implementation to not release a UE that is configured with eDRX or MICO mode and has joined a multicast session (without further specification changes).

## 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)?

|  |  |  |
| --- | --- | --- |
| **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) |  |
| Sharp | Yes |  |
| MediaTek | Yes |  |
| NEC | Yes with comment | Same view as E// |
| LGE | no strong view | but share the same view as QC. |
| Intel | No strong view | This can suggested during CR implementation. |
| Xiaomi | no strong view |  |
| Lenovo | no strong view |  |

**Summary:**

Companies agree with the editorial changes except for some errors.

The changes can be merged into the 38.331 rapporteur CR in next meeting.

**Way forward:**

**Proposal 13**: [R2-2303127](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_121/Docs//R2-2303127.zip) is agreed in principle (and will be merged into the rapporteur CR 38.331 for next meeting), with the following change:

Unless explicitly stated otherwise in the procedural specification, the MCCH information acquisition procedure overwrites any stored MCCH information, i.e., delta configuration is not applicable for MCCH information and the UE discontinues using a field if it is absent in MCCH information.

[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)?

|  |  |  |
| --- | --- | --- |
| **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 |
| Sharp | Yes |  |
| MediaTek | Yes |  |
| NEC | Yes |  |
| LGE | no strong view | but share the same view as QC. |
| Intel | No strong view | This can suggested during CR implementation. |
| Xiaomi | Yes |  |
| Lenovo | no strong view |  |

**Summary:**

Companies agree with the editorial change.

The change can be merged into the 38.331 rapporteur CR in next meeting.

**Way forward:**

**Proposal 14**: [R2-2304170](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304170.zip) is agreed in principle (and will be merged into the rapporteur CR 38.331 for next meeting).

## 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?

|  |  |  |
| --- | --- | --- |
| **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 |
| Sharp | No | It is an optimization. |
| MediaTek | No | This may introduce more detail discussion, which are not pursued in this stage (for Rel-17) |
| NEC | No | This is an optimization. |
| LGE | No | The shared processing issue (i.e. unicast + broadcast from non-serving) is also not considered in Rel-17. |
| Intel | No | Agree with others that MII is not that useful for RRC\_INACTIVE. |
| Xiaomi | No |  |
| Lenovo | No | SDT is only for SRB2? |

**Summary:**

All companies, except the proponent, did not agree with the proposal.

**Way forward:**

**Proposal 15**: Proposal 1 in [R2-2303967](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303967.zip) is not agreed.

**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:

|  |
| --- |
| 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

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

|  |  |  |
| --- | --- | --- |
| **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. |
| Sharp | Yes |  |
| MediaTek | Yes |  |
| NEC | Yes |  |
| LGE | - | We have a question which use case is mainly assumed for joint EHC and ROHC configuration. For example, is it assumed that MBS service is used for transmission of IIOT commands? With a proper use case, we think that joint EHC and ROHC is applicable for multicast MRB. |
| Intel | Yes |  |
| Xiaomi | Yes |  |
| Lenovo | Yes |  |

**Summary:**

All companies agreed with the proposed change.

**Way forward:**

**Proposal 16**: Proposal 2 in [R2-2303967](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303967.zip) is agreable (source company kindly provide CR 38.306 based on TP)

**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?

|  |  |  |
| --- | --- | --- |
| **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 |
| Sharp | No | Agree with Ericsson’s view. |
| MediaTek | No | Agree with Ericsson and Qualcomm |
| NEC | No |  |
| LGE | No | UE is allowed to sand MII even for broadcast provide by non-serving cell. In such case, the PLMN identity indicated in the TMGI may not be indicated in SIB1. |
| Intel | No | Agree with others that the limitation is not needed. |
| Xiaomi | No | Agree with Ericsson and Qualcomm |
| Lenovo | No |  |

**Summary:**

All companies, except the proponent, agreed that the restriction in proposal 3 is not valid.

**Way forward:**

**Proposal 17**: Proposal 3 in [R2-2303967](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303967.zip) is not agreed.

**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?

|  |  |  |
| --- | --- | --- |
| **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. |
| MediaTek | No | We should clarify that this case is not support in Rel-17 at this stage |
| NEC |  | Same view with QC |
| LGE | comment | Same view as CATT. |
| Intel | Yes with comments | Agree that not all SIB1 information should be provided in dedicated RRC signalling. |
| Xiaomi | Yes | We understand that this is an NBC change, but would like to check whether the change is acceptable to companies as the implementation may just be in progress. |
| Lenovo | Yes | The issue is valid. |

**Summary:**

All companies confirm this is an issue. But some companies indicate that this is a NBC change, and that perhaps this case should not be supported in Rel-17.

The rapporteur proposes to continue discussion in phase 2 and discuss possible solutions. Q19 is somewhat related to this discussion. And most companies replied to Q19 that introducing *sCellSIB1* is not preferred.

**Way forward:**

**Proposal 18**: Continue discussion in phase 2 whether an ASN.1 change is agreable to enable MBS broadcast reception on SCell when *plmn-Index* on MCCH is used.

**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?

|  |  |  |  |
| --- | --- | --- | --- |
| **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. |
| MediaTek | No |  | Agree with QC that the current spec can work in this case. |
| NEC | No |  | Soltuon 2 is already achieved by the current spec |
| LGE | No |  | NW can explicitly indicate the broadcast CFR and PDSCH configuration of MCCH of SCell via *sCellSIB20*. |
| Intel | No |  | We think solution 2 is already supported by current specification. |
| Xiaomi | No |  | Agree with Qualcomm. |
| Lenovo | No |  | It seems it has been support already. But we are fine to check it further for CFR case a and c. |

**Summary:**

Most companies think that no ASN.1 changes are needed, i.e. the existing signalling can be used. The proponent company points out that Case A and C are not supported with existing signalling.

The rapporteur proposes to continue the discussion in phase 2, assuming that no ASN.1 changes are needed for this case.

**Way forward:**

**Proposal 19**: No ASN.1 changes are needed for proposal 5 in [R2-2303967](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303967.zip). In phase 2 it is discussed if any clarification is needed (e.g. case A and C), if at all.

**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 proposals

Based on the feedback received in phase 1 the following proposals are made:

**Proposal 1**: [R2-2303919](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303919.zip) is in principle agreed with *sps-ConfigMulticastToAddModList-r17* in italic.

**Proposal 2**: The 2nd change in [R2-2303966](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303966.zip) is in principle agreed with the following changes:

|  |
| --- |
| ***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, the UE behavior is specified in TS 38.213 [13]. |

**Proposal 3**:Discuss further in phase 2 whether "configured in SIB1“ should be removed from the field description of *locationAndBandwidthBroadcast* .

**Proposal 4**: [R2-2302590](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302590.zip) is in principle agreed with the following change:

|  |
| --- |
| ***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 the value 1 for MBS multicast data and the *pdsch-AggregationFactor* in *pdsch-config* for other data. |

**Proposal 5**: The 1st change proposed in [R2-2302522](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302522.zip) is in principle agreed with the following change:

|  |
| --- |
| ***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). The *explicitValue* is not used for MBS service(s) of an SNPN. |

**Proposal 6**: Taking into account the feedback and information obtained in phase 1 it is discussed further in phase 2 whether the following change in the field description of *mbsInterestIndication* in AS-Context should be made (or not):

A TMGI for which the *plmn-Index* points to a non-serving SNPN is removed from the NR *MBSInterestIndication* message.

**Proposal 7**: The 1st proposed change in [R2-2303552](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303552.zip) is agreed in principle, with the following change:

|  |
| --- |
| ***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, 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, then the UE shall assume that MBS broadcast services signalled in *mbs-SessionInfoList* in the *MBSBroadcastConfiguration* message are not provided in any neighbour cell. |

**Proposal 8**: The 2nd change in [R2-2303552](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303552.zip) is not agreed.

**Proposal 9**: [R2-2302523](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302523.zip) is in principle agreed with the following change:

**5.9.3.3 Broadcast MRB establishment**

Upon a broadcast MRB establishment, the UE shall:

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> 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> 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;

**Proposal 10**: [R2-2302823](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302823.zip) is in principle agreed with the following changes:

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*:

2> if *PagingRecordList* is not included in the *Paging* message; or

2> if none of the *ue-Identity* included in any of the *PagingRecord* matches the UE identity allocated by upper layers:

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;

**Proposal 11**: [R2-2303031](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303031.zip) is not agreed.

**Proposal 12a**: MBS broadcast reception when the UE is configured with eDRX or MICO mode is left to UE implementation and not further clarified.

**Proposal 12b**: For MBS multicast two options are further discussed in phase 2 with the following two options as a baseline:

1. Clarification for MBS multicast as proposed in [R2-2303619](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303619.zip).
2. It is left to NW implementation to not release a UE that is configured with eDRX or MICO mode and has joined a multicast session (without further specification changes).

**Proposal 13**: [R2-2303127](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_121/Docs//R2-2303127.zip) is agreed in principle (and will be merged into the rapporteur CR 38.331 for next meeting), with the following change:

Unless explicitly stated otherwise in the procedural specification, the MCCH information acquisition procedure overwrites any stored MCCH information, i.e., delta configuration is not applicable for MCCH information and the UE discontinues using a field if it is absent in MCCH information.

**Proposal 14**: [R2-2304170](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304170.zip) is agreed in principle (and will be merged into the rapporteur CR 38.331 for next meeting).

**Proposal 15**: Proposal 1 in [R2-2303967](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303967.zip) is not agreed.

**Proposal 16**: Proposal 2 in [R2-2303967](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303967.zip) is agreable (source company kindly provide CR 38.306 based on TP)

**Proposal 17**: Proposal 3 in [R2-2303967](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303967.zip) is not agreed.

**Proposal 18**: Continue discussion in phase 2 whether an ASN.1 change is agreable to enable MBS broadcast reception on SCell when *plmn-Index* on MCCH is used.

**Proposal 19**: No ASN.1 changes are needed for proposal 5 in [R2-2303967](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303967.zip). In phase 2 it is discussed if any clarification is needed (e.g. case A and C), if at all.

# Phase 2

Phase 2 is a short phase to check if further progress can be reached on topics that were not concluded in phase 1, and to prepare for comeback online W2 Tuesday 14:30-15:30 UTC (BO1).

Please provide comments on the phase 2 questions before W2 Tuesday 05:00 UTC.

## Non-serving SNPNs in *MBSInterestIndication* in *HandoverPreparationInformation* message

Phase 1 summary:

* The UE includes TMGIs in the MII message based on UE’s interest and the content in USD and *SIB21*. This implies that the UE may show interest in non-serving PLMNs or non-serving SNPNs, if included in USD/*SIB21*. On the Uu interface the UE can only use *plmn-Index* for SNPNs in the MII message. For other PLMNs, if the PLMN ID is provided in *SIB1*, the UE may use the *plmn-Index* in the MII message.
* If the UE used *plmn-Index* for a PLMN in the MII message, then the gNG in *HandoverPreparationInformation* message:

the *plmn-Index* (if included by the UE in *tmgi*) is replaced by the PLMN ID, if needed

* In case Xn is configured, and *Broadcast PLMN Identity Info List NR* is provided in the setup, then the *plmn-Index* does not need to be replaced. The *plmn-Index* only needs to be replaced if the target gNB cannot understand the *plmn-Index*.
* RAN2 agreed that RAN2 specs do not preclude MBS broadcast reception on non-serving SNPNs in Rel-17. It is the understanding of the rapporteur that this implies to all RRC states, i.e. the UE may include non-serving SNPNs in the MII message. But as discussed during the online the MII message is constructed based the content in USD and *SIB21* (and no changes to USD/*SIB21* handling were agreed).
* In case the MII message only includes *plmn-Indexes* of the registered SNPN of the UE then the *serving NID* in the *NPN Mobility Information* can be used by the target node.
* In case Xn is configured, and *NPN Broadcast Information* is provided in the setup, then the *plmn-Index* of both serving and non-serving SNPNs can be understood by the target node.

**Q1**: Do companies share the understanding above? Please indicate any differences.

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Ericsson | Yes | @HW, CATT, Nokia: In our understanding this is a summary of what has been discussed online last meeting, what is captured in 38.331, and what has been discussed in phase 1 in this meeting. We thought it would be good to have a summary and common understanding how this works, and then see what needs to be clarified. Q1 is only the first step towards Q2. |
| Huawei, HiSilicon | See comments | Maybe clarification is needed for this question? What is the expected output for discussing this understanding and what is the issue we discuss here? This seems not what we discussed in Phase 1. |
| CATT | See comments | Similar confusion as Huawei,maybe it is easier to discuss based on phase 1proposals provided by the rapporteur. |
| Nokia | Not sure | Not sure where did this conclusion come from now – Seems to be deviating from phase1 quite a bit. |
| Qualcomm | Yes but | It seems the summary is correct, but see Q2 |
| Intel | Yes with comments | Our understanding is that Q1 is only to provide background information for later questions e.g. Q2. |

**Summary:**

The rapporteur provided the description to determine what clarifications/changes would be needed in Q2.

Most companies did neither confirm nor deny whether the description was correct. Two companies confirmed the correct understanding.

**Way forward:**

**Proposal 1**: The description is noted.

The MII message in the *HandoverPreparationInformation* message is an octet string which is normally transparently conveyed to the target gNB. When the source gNB needs to replace or remove something, than that needs to be clarified:

**Q2**: Do companies agree with the following clarification?:

|  |
| --- |
| ***mbsInterestIndication***  Includes the information last reported by the UE in the NR *MBSInterestIndication* message, where the *plmn-Index* for a PLMN (if included by the UE in *tmgi*) is replaced by the PLMN ID, if the target gNB cannot understand the *plmn-Index*. For a *plmn-Index* belonging a non-serving SNPN, if the target gNB cannot understand the *plmn-Index*, the corresponding PLMN ID is removed from the *MBSInterestIndication* message. |

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Ericsson | Yes | @HW, Nokia: It has already been captured that the source shall replace the *plmn-Index* if the target cannot understand it. For the non-serving SNPNs it has to be captured that the source shall remove TMGIs the target cannot understand. It does not make sense, and it is confusing, when a requirement is captured for one case, but not for the other. The second case is not covered by the first case, i.e. the TMGI has to be removed, i.e. this is a new requirement.  @CATT: We are also fine with the proposed wording by CATT, but we need to add “, if needed” to be consistent. |
| Huawei, HiSilicon | No | For the first sentence, we prefer not to extend the discussion further at this point. We see no issue with precious wording “if needed”. It should be already clear based on many times of discussion before. We should focus what we discuss in Phase 1.  For the second sentence, we prefer to leave this to gNB implementation. |
| CATT | comments | As the proponent,we support the P6,  **Proposal 6**: Taking into account the feedback and information obtained in phase 1 it is discussed further in phase 2 whether the following change in the field description of *mbsInterestIndication* in AS-Context should be made (or not):  A TMGI for which the *plmn-Index* points to a non-serving SNPN is removed from the NR *MBSInterestIndication* message. |
| Nokia | No | Similar view with Huawei |
| Qualcomm | No | Similar comment as Huawei |
| Intel | No | Agree with Huawei. |

**Summary:**

Two companies (2/6) companies think a clarification is needed. Four companies (4/6) think that it can be left to gNB implementation.

**Rapporteur**:

* The MII message in the *HandoverPreparationInformation* message is an octet string which is normally transparently conveyed to the target gNB.
* When the source gNB needs to replace or remove something, than that needs to be clarified. This is the reason why the first change was agreed in earlier meeting and captured in 38.331:

where the *plmn-Index* (if included by the UE in *tmgi*) is replaced by the PLMN ID

* In RAN2#121 it was also agreed that any further clarifications can be discussed in the next meeting:
* 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).
* It is inconsistent to only capture one case. And is creates confusiong/ambiguity about what the gNB should do.

**Way forward:**

**Proposal 2**: Discuss online whether the following change can be agreed:

A TMGI for which the *plmn-Index* points to a non-serving SNPN is removed from the NR *MBSInterestIndication* message.

## MBS multicast with eDRX and MICO mode

Configuration of eDRX and MICO mode is done via NAS signalling between UE and AMF. The UE joins a multicast session via NAS signalling to the SMF. There is no signalling concerning these features between AMF and SMF, i.e. the CN cannot prevent a UE from joining a multicast session when it is configured with eDRX or MICO mode (and vice versa).

In case *Core Network Assistance Information* *for RRC INACTIVE* IE is included in the INITIAL CONTEXT SETUP REQUEST message the gNB stores this in the UE context. This IE includes the eDRX and MICO mode configuration of the UE:

* MICO Mode Indication (ENUMERATED (true))
* NR Paging eDRX Information (eDRX in RRC\_IDLE):
  + NR Paging eDRX Cycle
  + NR Paging Time Window

The gNB also knows when the UE has joined a multicast session.

**Q3**: Which option do companies prefer to prevent inter-operability issue with MBS multicast and eDRX/MICO mode?:

**Option 1:** UE solution (the NOTE option is omitted here because that is already supported implicitly):

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.

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.

**Option 2:** RAN solution:

* The gNB does not release a UE that has joined a multicast session and is configured with eDRX or MICO mode, i.e. the UE is released after the UE has left the multicast session (no spec changes, i.e. *RRCRelease* is up to gNB implementation).

|  |  |  |
| --- | --- | --- |
| **Company** | **Which option is preferred** | **Comments** |
| Ericsson | 1 or 2 (if feasible) | We started to evaluate the RAN solution recently, i.e. based on the phase 1 comments. So far this seems a feasible solution. Perhaps further checks are needed when the UE leaves the session whether the RAN is updated immediately, and if there can be cases where the CN assistance info is not available in RAN.  If this solution is agreed, then we agree that it is up to UE implementation to join a multicast session when configured with eDRX or MICO mode.  We do not understand companies view here, i.e. it creates inter-operability problems if UE or NW do not prevent this. RAN2 always used to take inter-operability issues seriously and discuss solutions. We think this should not be captured in a NOTE, i.e. this is not really up to UE implementation to decide what to do. |
| Huawei, HiSilicon |  | Left to implementation with no spec impact. |
| CATT |  | OK to capture option 1 as a NOTE |
| Nokia | 2 | There is no need for creating any limitations. We can leave it up to gNB implementation in Rel-17. We see no need for any spec impact. |
| Qualcomm | No strong view |  |
| Intel | No strong view |  |

**Summary:**

There were different views, i.e. almost equal to the number of companies that replied.

**Rapporteur:**

* According to current specification, the UE may or may not ask for both MBS multicast and eDRX/MICO mode
* If the UE asks for both MBS multicast and eDRX/MICO mode the network does not deny that.
* The gNB can decide to not release a UE that has joined an MBS multicast session and is configured with eDRX/MICO mode, to prevent the UE not being reachabel when the session is activated. RRCRelease is up to gNB implementation, i.e. no specification changes needed.

**Way forward:**

**Proposal 3**: The changes proposed in [R2-2303619](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303619.zip) are not pursued.

## MBS broadcast reception on SCell and *plmn-Index* on MCCH

For broadcast reception on SCell the UE acquires the MCCH on SCell, but the UE does not receive *SIB1* of the SCell. In case *plmn-Index* is used for a PLMN/SNPN on MCCH on SCell, then the UE cannot determine the TMGI.

Companies confirmed that this is an issue, but it requires a NBC change, and some companies have concerns about that.

Further observations:

* It is beneficial to use *plmn-Index* on MCCH and for SNPNs it is the only option.
* Reception on SCell is prohibited only when the *plmn-Index* points to a different PLMN/SNPN on PCell and SCell and PCell cannot be reconfigured.
* A NID cannot be added to the source, i.e. TMGI-r17 IE cannot be extended.

In case an NBC change is acceptable, futher discussion is needed on the ASN.1 change, e.g.:

* include *plmn-IdentityInfoList* and *npn-IdentityInfoList* in *ScellConfig* (when the mapping is different)
* other solutions?

In case an NBC change is not acceptable, futher discussion is needed on the uses cases supported in Rel-17:

* PLMN ID is used for PLMN on MCCH (when the *plmn-index* on SCells is different)
* MBS broadcast reception for TMGI belonging to SNPN for which the *plmn-index* is different on PCell and SCell is not supported on SCell (but can be supported with reconfiguration of Pcell?)
* Other use cases?

**Q5**: Is an ASN.1 change agreable for Rel-17 to resolve any issues identified MBS broadcast reception on SCell and *plmn-Index* on MCCH?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Ericsson | Yes | Continuation of broadcast reception in RRC\_CONNECTED should be supported for both PLMN/SNPN, and it should be possible/encouraged to use *plmn-Index* on Uu interface. In case reception is limited to PCell for some services, then this would be a significant limitation. |
| Huawei, HiSilicon | Yes | Argee with Ericsson. This will be a huge limitation. Because the SCell for this UE can be a Pcell for other UEs. If we mandate NW to use explicit PLMN ID, it basically means in many cases the plmn-index way doesn’t work. Then it defeats the purpose of introducing the plmn-index to TMGI. |
| CATT | No strong view | OK to follow if the majority think asn.1 change is OK at this late phase. |
| Nokia | No | NBC change – if we would do this why would we not just add NPN in TMGI and we don’t need these hacks  [HW] The issue exsits not only in SNPN case but also normal PLMN case. For the normal PLMN case, the UE also doesn’t know the PLMN list in SCell. If the the broadcast in SCell is using plmn-index (the SCell may be PCell for other UEs), this UE wouldn’t be able to interpret the plmn-index. |
| Qualcomm | No, but see comments | Same comment as Nokia.  First of all, NBC ASN.1 change that affects other functions would be unacceptable at this stage.  Second, if ASN.1 is being touched, it can be extended to include NPN ID in ASN.1 BC manner (using extensions) to avoid all the hacks.  [HW] See the reply to Nokia. |
| Intel | Comments | This issue might be resolved by UE implementation e.g. UE can assume the PLMN info list in PCell is applicable to SCell.  We’re OK to have NBC ASN.1 change if this is the majority view. Agree with Nokia and Qualcomm that if we have the ASN.1 change, then it is better to introduce NPN ID in TMGI as well. |

**Summary:**

All companies agreed or were ok to have an ASN.1 change to solve this issue.

There were different views on what a BC and NBC ASN.1 change is, whether it is acceptable/wanted.

**Way forward:**

**Proposal 5:** Discuss further online whether RAN2 agrees that a solution is needed for *plmn-Index* with MBS broadcast reception on SCell in Rel-17 (details FFS).

**Q6**: In case the answer to Q5 is yes, what solution do companies prefer?:

**Option 1**: include *plmn-IdentityInfoList* and *npn-IdentityInfoList* in *ScellConfig*

**Option 2**: other solution?

Option 3: adnd explicit NPN signaling in TMGI

|  |  |  |
| --- | --- | --- |
| **Company** | **What solution is preferred?** | **Comments** |
| Ericsson | 1 | We are fine to have a solution for the Scell use case only, i.e. the other use cases do not require a change, and it is preferred to send *plmn-Index* only, if that is possible.  A solution for Scell should include both PLMN and SNPNs.  @Nokia: can you further clarify how the NID would be added to the TMGI? |
| Huawei, HiSilicon | 1 |  |
| CATT | 2(including SIB1 in ScellConfig) | Considering the issues in section 5.4 is also related to parameter in SIB1,it is simpler to Include the whole SIB1 in ScellConfig. |
| Nokia | Obvious solution option 3 seems missing | Add NPN in TMGI if any solution is deemed necessary |
| Qualcomm | Option 3 | Add NPN ID in TMGI in ASN.1 BC manner, if any solution is deemed necessary |
| Intel | 1, 3 | If ASN.1 change is needed, it is better to have option 1 for SCell, and also option 3 to resolve NPN issue. |
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**Summary:**

There are different views on whether a BC or NBC ASN.1 change should be agreed (all changes are functionally NBC).

The rapporteur points out that the TMGI-r17 cannot be extended:

TMGI-r17 ::=                     SEQUENCE {

    plmn-Id-r17                      CHOICE {

        plmn-Index                       INTEGER (1..maxPLMN),

        explicitValue                    PLMN-Identity

    },

    serviceId-r17                    OCTET STRING (SIZE (3))

}

Thus when NID is added to the TMGI, this is a NBC ASN.1 change, e.g. TMGIwithNID-r17 is introduced, and TMGI-r17 is replaced with TMGIwithNID-r17 in the places where it is used.

An example of a BC change is when a NID-list is added as a Rel-17 non critical extension in the places where currently TMGI-r17 is used.

The rapporteur thinks that there is no need to include the NID for other cases then broadcast reception on SCell, i.e. no need to indicate SNPNs that are not included in SIB1.

**Way forward:**

**Proposal 6:** Discuss possible solutions further online:

* Is there a need to signal SNPNs that are not included in SIB1?
* Is a NBC ASN.1 change acceptable for Rel-17 (e.g. introduce TMGIwithNID-r17)?
* Is a BC ASN.1 change acceptable for Rel-17 (e.g. NID-list in Rel-17 extension)?

## MBS broadcast reception on SCell with broadcast CFR and PDSCH configuration of MCCH

The *sCellSIB20* includes the MCCH configuration but also the CFR for MCCH/MTCH:

cfr-ConfigMCCH-MTCH-r17 CFR-ConfigMCCH-MTCH-r17 OPTIONAL, -- Need S

Common frequency resource used for MCCH and MTCH reception. If the field is absent, the CFR for broadcast has the same location and size as CORESET#0 and PDSCH configuration of MCCH is the same as PDSCH configuration provided in *initialDownlinkBWP* in *SIB1*.

locationAndBandwidthBroadcast-r17 LocationAndBandwidthBroadcast-r17 OPTIONAL, -- Need S

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 and CORESET#0 configured in *SIB1*.

If the field is absent, the CFR for broadcast has the same location and size as CORESET#0.

Pdsch-ConfigMCCH-r17 PDSCH-ConfigBroadcast-r17 OPTIONAL, -- Need S

If the field is absent, PDSCH parameters used for MCCH are the same as those of PDSCH configuration provided in *initialDownlinkBWP* in *SIB1*.

The UE does not receive *SIB1* of Scell, but there is no ambiguity when the NW signals *sCellSIB20* that includes explicit values for *cfr-ConfigMCCH-MTCH*, *locationAndBandwidthBroadcast* and *pdsch-ConfigMCCH*.

The proponent company indicated that the current specification cannot support Case A and C for CFR:

**Chart

Description automatically generated**

Because the specification says:

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*.

It is the understanding of the rapporteur that *SIB1* above refers to the *SIB1* on Scell. And that if the NW includes explicit values for *cfr-ConfigMCCH-MTCH* and *locationAndBandwidthBroadcast* in *sCellSIB20* then there are no configuration restrictions. The proponent company is kindly invited if something has been overlooked.

**Q7**: Do companies think that ASN.1 changes or clarifications are needed for proposal 5 in [R2-2303967](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303967.zip)?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Ericsson | No | We think that it can be left to NW implementation to signal *sCellSIB20* correctly. |
| Huawei, HiSilicon | Yes | We agree that “there is no ambiguity when the NW signals *sCellSIB20* that includes explicit values for *cfr-ConfigMCCH-MTCH*, *locationAndBandwidthBroadcast* and *pdsch-ConfigMCCH* ”. But the explicit values is “larger than and fully contains the bandwidth for the initial DL BWP in *SIB1* ”. This is the configuration restriction and NW cannot configure randomly with the explicit value.  Also other concerns are when the NW signals *sCellSIB20* that doesn’t include *locationAndBandwidthBroadcast* and *pdsch-ConfigMCCH*, then how does the UE know the CFR configuration and PDSCH configuration, considering that the UE doesn’t know the SIB1 of Scell? |
| CATT | No strong view | OK to follow if the majority think asn.1 change is OK at this late phase. |
| Nokia | No |  |
| Qualcomm | No | Agree with Ericsson’s comment |
| Intel | No | Our understanding is that existing signalling already supports Case A and C for broadcast reception in SCell.  IE LocationAndBandwidthBroadcast-r17 has the following field description:  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 and CORESET#0 configured in SIB1.  If the field is absent, the CFR for broadcast has the same location and size as CORESET#0.  Yellow part is for Case A, and cyan part is for Case C. In existing IE *DownlinkConfigCommon* for SCell, the information of initial BWP and its CORESET#0 is already signalled. |

**Summary:**

Most companies (4/6) think that no change/clarification is needed, one company has no strong view.

**Way forward:**

**Proposal 7:** Proposal 5 in [R2-2303967](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303967.zip) is not agreed.

## CORESET#0 cannot be configured in *SIB1*:

**Q8**: Which option do companies prefer for the 3rd change in [R2-2303966](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303966.zip)?:

**Option 1**: Move *configured in SIB1*:

|  |
| --- |
| ***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. |

**Option 2**: Remove *configured in SIB1*:

|  |
| --- |
| ***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.  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.  If the field is absent, the CFR for broadcast has the same location and size as CORESET#0. |

|  |  |  |
| --- | --- | --- |
| **Company** | **Preferred option** | **Comments** |
| Ericsson | 1 or 2 | In other cases in 38.331 where initial BWP is mentioned *if configured in SIB1* is not used. But we are fine with either solution. |
| Huawei, HiSilicon | 1 | We don’t see the reason why we remove “configured in SIB1”. |
| CATT | 1 | Agree with HW,no motivation to remove it. |
| Nokia | 1 is ok |  |
| Qualcomm | Either is Ok | This question was based on Nokia’s comment in ph1. Since Nokia is supporting option 1 now, no point discussing this further 😊 |
| Intel | Either is OK. |  |

**Summary:**

All companies either prefer 1 or are ok with both.

**Way forward:**

**Proposal 8:** 3rd change in [R2-2303966](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303966.zip) is agreed.

# Phase 2 proposals

Based on the feedback received in phase 1 the following proposals are made:

**Proposal 1**: The description is noted.

**Proposal 2**: Discuss online whether the following change can be agreed:

A TMGI for which the *plmn-Index* points to a non-serving SNPN is removed from the NR *MBSInterestIndication* message.

**Proposal 3**: The changes proposed in [R2-2303619](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303619.zip) are not pursued.

**Proposal 5:** Discuss further online whether RAN2 agrees that a solution is needed for *plmn-Index* with MBS broadcast reception on SCell in Rel-17 (details FFS).

**Proposal 6:** Discuss possible solutions further online:

* Is there a need to signal SNPNs that are not included in SIB1?
* Is a NBC ASN.1 change acceptable for Rel-17 (e.g. introduce TMGIwithNID-r17)?
* Is a BC ASN.1 change acceptable for Rel-17 (e.g. NID-list in Rel-17 extension)?

**Proposal 7:** Proposal 5 in [R2-2303967](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303967.zip) is not agreed.

**Proposal 8:** 3rd change in [R2-2303966](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303966.zip) is agreed.

# 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