**3GPP TSG-RAN WG1 #110bis-e R1-221xxxx**

**e-Meeting, October 10 – 19, 2022**

**Agenda Item: 8.12**

**Source: Moderator (Huawei)**

**Title: FLS on** **the issues for NR MBS maintenance**

**Document for: Discussion and Decision**

# Introduction

[110bis-e-R17-MBS-01] Email discussion to determine maintenance issues to be handled in RAN1#110bis-e by October 12 – Jinhuan (Huawei)

* Additional email discussions will be set up once the maintenance issues for RAN1#110bis-e are determined
* Including discussion on [R1-2208581](file:///C%3A%5CUsers%5Czhumin%5CAppData%5CLocal%5CPackages%5CMicrosoft.MicrosoftEdge_8wekyb3d8bbwe%5CDocs%5CR1-2208581.zip) from agenda item 5

This summary provides the discussion for the remaining issues to be discussed in this e-meeting. FL initial assessment is provided according to:

*• High priority (H): high-priority item (essential, pending issues, broken spec components) and proposed editorial changes that either enhance the clarity of the specs or correct mistakes.*

*• Non-essential (N): Not essential issues and the discussion may not be pursued.*

*• Editorial (E): editorial issues that will be endorsed for alignment CR.*

# Issues for discussion

The HARQ-ACK related issues and the scheduling related issues are summarized in Table 1 and Table 2, respectively, with FL notes and FL initial assessment provided. Companies can provide comments/views for helping sort out the issues to be discussed in this e-meeting.

Note: the issue for discussion on [R1-2208581](file:///C%3A%5CUsers%5Czhumin%5CAppData%5CLocal%5CPackages%5CMicrosoft.MicrosoftEdge_8wekyb3d8bbwe%5CDocs%5CR1-2208581.zip) from agenda item 5 is summarized in Table 2.

Preparation

Table 1: Summary of HARQ-ACK related issues

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Issue#** | **Issue** | **References** | **FL initial assessment**  | **Company inputs (if any)** |
| 1-1 | PRI for NACK-only mode2*FL Note: sources have different views on whether PRI is interpreted. Need to first clarify whether moreThanOneNackOnlyMode is only applicable to the case when more than one TB is scheduled.*  | vivo-CR-x08618,Nokia-TP-x08701,CMCC-Dis-x09310,ZTE-CR-x09475,Apple-Dis-x09566,Huawei-CR-x08468,Huawei-Dis-x09822Samsung-Dis-x09708,Ericsson-Dis-x10173 | H | [QC] We are not clear how to understand ‘more than one TB is scheduled’. Is it from gNB perspective or UE perspective? There is a case that gNB schedules multiple TBs but UE only receives one due to missing DCI(s). Also, the issue 1-1 is related with 1-7, where if case 2/3 are not supported, the decision on PRI would be simpler. |
| 1-2 | Codebook type for NACK-only*FL Note: Discuss whether type1 CB can be configured if UE is configured with NACK-only.*  | Samsung -Dis-x09708,Qualcomm-CR-x09955,Huawei-CR-x08467,Huawei-Dis-x09822,Ericsson-Dis-x10173 | H |  |
| 1-3 | HARQ-ACK feedback for 4\_1 when configured “dci-enabler”*FL Note: clarify UE behavior whether generate HARQ-ACK for DCI 4\_1 when UE is configured with “dci-enabler”.*  | vivo-CR-x08617,CATT-CR-x08928,Lenovo-CR-x10156 | H | [CATT]: Agree with FL’s assessment. The field of ‘enabling/disabling HARQ-ACK feedback indication’ is not included in DCI format 4\_1. In the current spec, it’s not clear about the UE behavior whether generate HARQ-ACK for PDSCH scheduled by DCI format 4\_1 when UE is configured with ‘dci-enabler’. |
| 1-4 | Timeline for NACK-only*FL Note: Tdocs from UE vendors point to a serious implementation issue.*  | ZTE-Dis-x09470,MediaTek-CR-x09526,Samsung-Dis-x09708,Qualcomm-CR-x09959Huawei-CR-x08466,Huawei-CR-x09832, | H |  |
| 1-5 | PUCCH resources for NACK-only multicast SPS*FL Note: FFS from previous meeting and spec change is needed.*  | Nokia-TP-x08701,ZTE-Dis-x09470,Samsung-TP-x09708, Huawei-Dis-x09822 | H | [vivo]: Agree with FL’s assessment.[ZTE]: We agree with FL initial assessment.  |
| 1-6 | Type1 CB and “dci-enabler” not configured simultaneously*FL Note: This conclusion should be the common understanding but whether spec change is needed can be discussed to collect views.*  | Qualcomm-CR-x09954,Lenovo-CR-x10158 | H |  |
| 1-7 | NACK-only mode2 for case2 and case3*FL Note: discussed for several meetings. Introducing any RRC parameters should be refrained.* *FL doubt to reach solution with consensus.* *The discussion can focus on whether spec clarification change is also needed even if case2 or case 3 is not supported in combination with NACK-only mode2.* | Nokia-TP-x08701,NEC-Dis-x09137,CMCC-Dis-x09310,ZTE-Dis-x09470,MediaTek-Dis-x09527,Apple-Dis-x09566,Samsung-TP-x09708,DOCOMO-CR-x09884,Lenovo-Dis-x10159,Ericsson-Dis-x10173 | H | [Nokia] Agree that this [H] priority and would like the FL/group to focus on the options that require minimal spec. changes.[vivo]: This issue has been discussed for several times, but no consensus was achieved. It is suggested not to be pursued.[QC] If case 2 or 3 are not supported, we think the current spec of “A UE that is indicated the second HARQ-ACK reporting mode **for only one G-RNTI** can be indicated by *moreThanOneNackOnlyMode* …” is sufficient. |
| 1-8 | Whether DAI should count the PDCCH with “dci-enabler” indicating value 0— if not counted, the spec for Type2 CB needs update for the DAI description.  | Langbo-CR-x08995,Lenovo-CR-x10157 | H |  |
| 1-9 | Type2 CB for multicast SPS—*38.213 states UE separately applies the procedures in this clause per G-RNTI or per G-CS-RNTI, but the clause also includes SPS PDSCHs. How to generate Type2 CB for multicast SPS PDSCH is unclear**FL Note: FL agrees that it may cause confusion. The discussion in this meeting can focus on whether change is needed.*  | vivo-CR-x08619 | H |  |
| 1-10 | the current description only allows to configure one HARQ-ACK codebook for multicast-- *pdsch-HARQ-ACK-Codebook* is replaced by the relevant entry in *pdsch-HARQ-ACK-CodebookListMulticast-r17**FL Note: aligning with TS38331 should be easily agreeable for this meeting* | CMCC-CR-x09312 | H |  |
| 1-11 | Change “UE is provided *moreThanOneNackOnlyMode” to “UE is not provided moreThanOneNackOnlyMode”**FL Note: aligning with TS38331 should be easily agreeable for this meeting* | vivo-CR-x08618,Huawei-CR-x08468 | H | [QC] both CRs seem include the modifications more than changing ‘UE is provided *moreThanOneNackOnlyMode” to “UE is not provided*’. We assume the intention of 1-11 is to simply align the 38331 of *moreThanOneNackOnlyMode* as suggested by FL. Is it correct understanding? |
| 1-12 | Multiplexing one unicast SPS and DG multicast-- *gNB wouldn’t be able to schedule multicast PDSCHs to transmit HARQ-ACK in the same slot with unicast SPS HARQ-ACK* ***if UE does not support more than one SPS configuration****FL Note: FL agrees it is better to be discussed but not sure what solution can be accepted in this meeting. The discussion on focus on solutions and then the CR.*  | vivo-CR-x08887 | H |  |
| 1-13 | PTP retrans for NACK-only when applicable—*when NACK-only is converted into ACK/NACK, PTP retrans can be applied. NACK-only taking PTM retrans is too restrictive.*  | Huawei-CR-x10207 | H | [Nokia] We consider that this discussion can be deprioritized. At this stage, we are unclear of a strong use case for this form of retransmission given the primary motivation for using NACK-only is to have a group-common PUCCH.[vivo]: This issue has been discussed in last meeting. It is suggested not to be pursued.[QC] The issue is not essential but an optimization per our understanding. |
| 1-14 | Delete the redundant descriptions of “if *pdsch-HARQ-ACK-Codebook-Multicast = semiStatic* is configured” to 38212. *FL Note: avoid unnecessary checking whether other meaning is implied by the redundant description and easily agreeable for this meeting* | Lenovo-CR-x10155 | Enhance clarityeasily agreeable for progress |  |
| 1-15 | Change “*pdsch-HARQ-ACK-Codebook-Multicast” to “pdsch-HARQ-ACK-Codebook”.**FL Note: editorial but easily agreeable for this meeting* | CMCC-CR-x09312 | Ebut easily agreeable for progress |  |
| 1-16 | pdsch-HARQ-ACK-retx for multicast- *pdsch-HARQ-ACK-retx can include the HARQ-ACK feedback for multicast**FL Note: it may be better to be clarified.*  | CATT-CR-x08925, | Discuss at RAN1#110bis-e only to clarify the issue and whether it is essential (to control the workload) | [CATT] We think this issue is high items and requires essential clarify. It should be clarified whether the parameter pdsch-HARQ-ACK-retx can be applied for both of multicast and unicast. There is no additional spce impact.Note that the HARQ CB of multicast may be multiplexed with HARQ CB of unicast, if *pdsch-HARQ-ACK-retx* cannot be applied for both of multicast and unicast, and then RAN1 needs specify how to remove HARQ-ACK CB of multicast from the multiplexed CB.[Nokia] In our view, there is no need to specifically work on procedures introduced in Rel-17. This would open doors to many non-essential optimizations.[vivo]: This issue is related with the interaction of different R17 features which is better to have a common principle. |
| 1-17 | spsHARQdeferral for multicast SPS-- *whether RRC parameter IE spsHARQdeferral can be used for multicast SPS configuration**FL Note: it might be true as claimed that additional spec impact is none or very trivial to have spsHARQdeferral configurable for multicast SPS.*  | CATT-CR-x08926, | Discuss at RAN1#110bis-e only to clarify the issue and whether it is essential, no discussion on solutions (to control the workload) | [CATT] We think this issue is high items and requires essential clarify. The IE *SPS-Config* is used to configure SPS transmission of multicast, and the IE *spsHARQdeferral* has been included in the IE *SPS-Config*. It should be clarified whether RRC parameter IE *spsHARQdeferral* can be used for multicast SPS configuration.[Nokia] In our view, there is no need to specifically work on procedures introduced in Rel-17. This would open doors to many non-essential optimizations.[vivo]: This issue is related with the interaction of different R17 features which is better to have a common principle. |
| 1-18 | Type3 for NACK-only mode-- *For generating a Type-3 HARQ-ACK codebook with 〖NDI〗\_HARQ=1, the UE considers the HARQ-ACK information corresponding to a PDSCH reception has been reported if a PUCCH was not transmitted due to all values of HARQ-ACK information including the one for the PDSCH reception being ‘ACK’ according to the second HARQ-ACK reporting mode.* *FL Note: the change may be needed for specification completeness.*  | Langbo-CR-x08996 | Discuss at RAN1#110bis-e only to clarify the issue and whether it is essential (to control the workload) |  |
| 1-19 | * NACK-only mode2 multiplexed with other UCI/PUSCH is supported

*FL Note: supported but the current spec suffices?* * SR and ack/nack based multiplexing with 1bit for unicast and 1 bit for multicast.

*FL Note: how to change spec?* * HARQ-ACK multiplexing for u-cast and m-cast is per priority and then applying the intra-UE multiplexing

*FL Note: how to change spec?* | LGE-Dis-x09449 | Discuss at RAN1#110bis-e only to clarify the issue and whether it is essential (to control the workload) | [vivo]: It is better to clarify the order of UE procedures. In our understanding, UE performs multiplexing HARQ-ACK of unicast and multicast, then performs other intra-UE multiplexing. No spec change is needed. |
| 1-20 | UE behavior for disabled HARQ for NTN multicast needs to clarified.*FL Note: for UE supporting both NTN and multicast.*  | Qualcomm-CR-x09960 | Discuss at RAN1#110bis-e only to clarify the issue and whether it is essential (to control the workload) | [vivo]: This issue is related with the interaction of different R17 features which is better to have common principle.[QC] we raised this issue in last RAN1 meeting but no time to discuss it. The issue 1-20 should be [H] to clarify the UE/gNB behavior:  - whether/which case multicast PDSCH can be scheduled with a HARQ process with disabled feedback or not- If multicast PDSCH is allowed to be scheduled with a HARQ process with disabled feedback, whether to let UE follow the feedback codebook generation based on NTN scheme or multicast scheme. |
| 1-21 | UE will not transmit NACK-only PUCCH when the HARQ-ACK information is ‘ACK’. This is missing for NACK-only mode1??*FL Note: Not sure whether the issue is understood. If it is NACK-only mode1, PUCCH is indicated by PRI, determining overlapping with PUSCH is referring to the legacy procedure. No change is needed.*  | ZTE-CR-x09476 | Not an essential correctionNot pursued  | [vivo]: The issue can be discussed together with issue 1-1, since if moreThanOneNackOnlyMode is only applicable to the case when more than one TB is scheduled, the issue is valid.[ZTE]: We think this issue should be discussed. We would like to clarify this issue. For NACK-only feedback, when the NACK-only PUCCH resource overlaps with the other PUCCH or PUSCH, the UE should assume the NACK-only PUCCH is transmitted so as to the UE can perform multiplexing by following the current mechanism even though the UE decodes all the PDSCH correctly. This has been captured in the current spec only for the case of NACK-only mode 2. However, this is still missing for NACK-only mode 1. It should be fixed. We guess it may be easily agreed.  |
| 1-22 | Multiplexing NACK-only and SR*FL Note: open issue has been discussed for several times. As clarified, if no consensus for the solution, it means not support the multiplexing and it is up to UE so UE behavior is not needed. FL suggest dropping the discussion* | Nokia-TP-x08701,NEC-Dis-x09137,ZTE-Dis-x09470,MediaTek-Dis-x09527,DOCOMO-CR-x09885 | Not an essential correctionNot pursued  | [Nokia] Can we have a chair’s note to conclude that this is left to UE implementation on which one to drop – i.e., SR or NACK-only?[ZTE]: We think this issue should be discussed because companies may have different understandings for this case if it is not resolved.  |
| 1-23 | Fix the size of DAI field in DCI format 4\_2 to two. -- *If different codebook types are configured among UEs in a group, the understanding of the DAI field size will not be aligned.**FL Note: UE just follows the configuration and NW will ensure the proper configuration. No change is needed.*  | DOCOMO-CR-x09882 | Not an essential correctionNot pursued |  |
| 1-24 | Specify that ACK/NACK based feedback is provided for the first GC-PDSCH after activation, and NACK-only based feedback is provided for the other SPS GC-PDSCHs.*FL Note: FL views no change is needed. The current spec is saying the same thing.*  | DOCOMO-CR-x09883 | Not an essential correctionNot pursued | [vivo]: The current spec only says “The second HARQ-ACK reporting mode is not applicable for the first SPS PDSCH reception after activation of SPS PDSCH receptions for a SPS configuration, or for DCI formats having associated HARQ-ACK information without scheduling a PDSCH reception”, it does not say anything on how to feedback for the first SPS PDSCH reception after activation of SPS PDSCH receptions or for DCI formats having associated HARQ-ACK information without scheduling a PDSCH reception. It is better to treat the CR as editorial CR. |
|  |  |  |  | [ZTE] Seems some issues from our contribution x09470 are not summarized, which are shown below. Hope FL could also collect companies’ views on these issues. Thanks.1) The first one is just a clarification issue on PUCCH resource configuration. We are afraid people may have different understanding since the two agreements seem not consistent with each other and the current spec is also not clear. At first, we agree that the gNB can configure at most 32 PUCCH resources for NACK-only. For NACK-only mode 2, 15 PUCCH resources from the PUCCH resource set are used. It is not clear whether they (32 PUCCH resources and 15 PUCCH resources) are in the same PUCCH resource set. If they are in different PUCCH resource sets, how to configure them? 2) The second one is the HARQ-ACK multiplexing in the PUSCH in the absence of PUCCH resource. We think this issue should be clarified to see whether companies are on the same page.3) The third one is the UE behavior in the case of the NACK-only PUCCH overlapping with other PUCCH or PUSCH with different L1 priorities. The DCI format 4\_2 can indicate the L1 priority. There is no existing mechanism to follow since NACK-only feedback is not supported for unicast. If it is not discussed, the UE behavior is not clear. |

Table 4: Summary of scheduling related issues

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Issue#** | **Issue** | **References** | **FL initial assessment**  | **Company inputs (if any)** |
| 2-1 | CR on the MBS reception type combinations in TS 38.202/38.213/38.214*FL Note: correct the PDSCH reception restriction/type combinations as well as specs alignment between TS 38.202/38.213/38.214* | CMCC[R1-2209311]ZTE[R1-2209473]MediaTek[R1-2209524]Huawei[R1-2210208][R1-2210209][R1-2210210] | H  | [ZTE]: Agree with FL initial assessment. |
| 2-2 | CR on the maximum data rate for multiplexing MBS and unicast*FL Note: Continue discussion of the clarification of the max data rate/LBRM for unicast and MBS multiplexing*  | Huawei[R1-2209833] Qualcomm[R1-2209956][R1-2209957][R1-2209958] | H | [ZTE]: Do not agree. The issue has been discussed for several meetings without big progress and it seems to be a non-essential issue. |
| 2-3 | CR on PDCCH monitoring behavior when overlaps with rate matching pattern*FL Note: initial discussion in last RAN1 meeting, further discussion is needed in this meeting* | Huawei[R1-2208469]MediaTek[R1-2209525]Qualcomm[R1-2209961] | H | [ZTE]: Agree with FL initial assessment. |
| 2-4 | TP on FDRA determination of multicast DCI formats*FL Note: correct the FDRA bitlength formula, easily to be agreeable* | Nokia[R1-2208701] | H | [ZTE]: Agree with FL initial assessment. |
| 2-5 | CR on SS0 availability for scheduling MBS *FL Note: align the UE behavior of using SS0 for MBS between TS 38.331 and TS 38.213* | Huawei[R1-2208470] | H | [ZTE]: Agree with FL initial assessment. |
| 2-6 | CR on multicast rate-matching pattern configuration number*FL Note: align the configured multicast rate-matching pattern number between TS 38.331 and TS 38.214* | CMCC[R1-2209313] | H | [ZTE]: Agree with FL initial assessment. |
| 2-7 | CR on CFR configuration and simultaneous configuration of multicast PDSCH on two serving cells*FL Note: correct the CFR bandwidth and location configuration* | ZTE[R1-2209471]CATT[TP#2 in R1-2208927] | H | [CATT] Agree with FL’s assessment. RAN1 agreed that the UE is not required to be configured PDSCHs on two serving cells. Although the agreement has been captured in the current specification, it doesn’t align with the agreement,[QC] We think the current RAN2 spec has clarified the configuration and RAN1 spec can just delete “ ~~The UE is not required to simultaneously receive PDSCHs on two serving cells.~~” as spec alignment. |
| 2-8 | CR on collision handling between SPS and DG for MBS*FL Note: define the UE behavior of PDSCH collision between unicast DG and multicast SPS or MBS DG and unicast SPS* | CMCC[R1-2209314] | H | [ZTE]: Agree with FL initial assessment. |
| 2-9 | CR on multicast SPS activation validation when UE is only configured one multicast SPS*FL Note: To address the issue that SPS index=0 cannot be configured to some UE which only supports one multicast SPS* | ASUSTeK[R1-2210075] | H | [ZTE]: Agree with FL initial assessment. |
| 2-10 | CR on definition of G-CS-RNTI for SPS group-common PDSCH retransmission*FL Note: FL views this CR is not pursued, the following sentence in TS 38.213 has declared that G-CS-RNTI can be used for SPS GC-PDSCH retransmission.* *“For the first HARQ-ACK reporting mode and for a transport block that a UE received in a SPS PDSCH, a PDSCH reception providing a retransmission of the transport block can be scheduled either by a unicast DCI format using a CS-RNTI or by a multicast DCI format using a same G-CS-RNTI as the G-CS-RNTI of the initial transmission of the transport block [6, TS 38.214].”* | CATT[TP#1 in R1-2208927] | Not an essential correctionNot pursued | [CATT] We think the CR on definition of G-CS-RNTI is an essential correction. Since RAN1 has been agreed define G-CS-RNTI for providing activation, release and scheduling retransmission of SPS PDSCH. However, in the current spec, it is described as ‘ The UE can be provided one or more G-CS-RNTI per serving cell for scrambling the CRC of multicast DCI formats providing activation/release for SPS PDSCH receptions.’ , and ‘providing scheduling retransmission for SPS PDSCH receptions’ was not captured. Although G-CS-RNTI used for scheduling retransmission for SPS PDSCH receptions can be inferred from the FL’s explanation, for the sentence of G-CS-RNTI definition, it still miss the description of ‘providing scheduling retransmission for SPS PDSCH reception’. We believe the function of G-CS-RNTI for activation/release/scheduling retransmission should be treated equally in the spec.  |
| 2-11 | Alignment CR on RRC parameters correction in TS 38.211 | CMCC[R1-2209315] | E | [ZTE]: Agree with FL initial assessment. |
| 2-12 | Alignment CR on RRC parameters correction in TS 38.213 | CMCC[R1-2209316]ASUSTeK[R1-2210095] | E | [ZTE]: Agree with FL initial assessment. |
| 2-13 | Alignment CR on RRC parameters correction in TS 38.213 | CMCC[R1-2209317] | E | [ZTE]: Agree with FL initial assessment. |
| 2-14 | Alignment CR on RRC parameters correction in TS 38.214 | CMCC[R1-2209318]ASUSTeK[R1-2210096] | E | [ZTE]: Agree with FL initial assessment. |
| 2-15 | CR on terms of G-RNTI used for MTCH*FL Note: ok to align the usage of the terms across the entire spec* | ZTE[R1-2209472] | E | [ZTE]: Agree with FL initial assessment. |
| 2-16 | per G-RNTI timeDurationForQCL configuration | LGE[R1-2209449] | Discuss at RAN1#110bis-e only to clarify the issue and whether it is essential (to control the workload) |  |
| 2-17 | CR on FDM SPS collision handling*FL Note: half of companies commented it as non-essential issue in last RAN1 meeting* | vivo[R1-2208620]ZTE[R1-2209474Ericsson [R1-2210173] | Not an essential correctionNot pursued | [vivo] We think it should be discussed at least for the case UE is only capable of receiving FDMed unicast and multicast PDSCH, otherwise, the spec is incomplete.[ZTE]: We prefer to discuss this issue and we share the same view with vivo. |
| 2-18 | MBS SPS configuration on SCell*FL Note: The LS was guided to be discussed in UE feature session but was not touched due to limited time in the last meeting. FL assesses LS reply is not necessarily needed even though the issue has not been reached in UE feature discussion session.*  | vivo-Draf LSR-x08581 | Discuss at RAN1#110bis-e only to clarify whether LS reply is needed though the issue will not be finalized in UE feature session in time (to control the workload) | [ZTE]: Agree with FL initial assessment. |

# References

1. R1-2208466 Correction on processing timeline for NACK-only mode2 to TS38.214 Huawei, HiSilicon, CBN
2. [R1-2208467](file:///D%3A%5C2022%5CDocs%5CR1-2208467.zip) Correction on codebook type for NACK-only HARQ-ACK feedback to TS38.213 Huawei, HiSilicon, CBN
3. [R1-2208468](file:///D%3A%5C2022%5CDocs%5CR1-2208468.zip) Correction on PRI for NACK-only HARQ-ACK feedback to TS38.213 Huawei, HiSilicon, CBN
4. [R1-2208469](file:///D%3A%5C2022%5CDocs%5CR1-2208469.zip) Correction on UE behaviors of PDCCH monitoring for configured RM patterns to TS38.213 Huawei, HiSilicon, CBN
5. [R1-2208470](file:///D%3A%5C2022%5CDocs%5CR1-2208470.zip) Correction on SS0 availability for scheduling MBS to TS38.213 Huawei, HiSilicon, CBN
6. [R1-2208617](file:///D%3A%5C2022%5CDocs%5CR1-2208617.zip) Draft CR on HARQ-ACK feedback for PDSCH scheduled by DCI format 4-1 vivo
7. [R1-2208618](file:///D%3A%5C2022%5CDocs%5CR1-2208618.zip) Draft CR on PUCCH determination for UE configured with NACK-only feedback mode vivo
8. [R1-2208619](file:///D%3A%5C2022%5CDocs%5CR1-2208619.zip) Draft CR on type 2 codebook determination with DG PDSCHs and SPS PDSCHs vivo
9. [R1-2208620](file:///D%3A%5C2022%5CDocs%5CR1-2208620.zip) Discussion on SPS PDSCH overlapping handling in FDM case vivo
10. [R1-2208701](file:///D%3A%5C2022%5CDocs%5CR1-2208701.zip) Remaining Issues for RRC\_CONNECTED UEs supporting MBS Nokia, Nokia Shanghai Bell
11. [R1-2208887](file:///D%3A%5C2022%5CDocs%5CR1-2208887.zip) Draft CR on HARQ-ACK multiplexing of unicast SPS PDSCHs and multicast DG PDSCHs vivo
12. [R1-2208923](file:///D%3A%5C2022%5CDocs%5CR1-2208923.zip) Discussion on MBS supporting HARQ-ACK codebook retransmission CATT
13. [R1-2208924](file:///D%3A%5C2022%5CDocs%5CR1-2208924.zip) Discussion on MBS supporting  deferring HARQ-ACK for SPS PDSCH CATT
14. [R1-2208925](file:///D%3A%5C2022%5CDocs%5CR1-2208925.zip) Draft CR on MBS supporting HARQ-ACK codebook retransmission CATT
15. [R1-2208926](file:///D%3A%5C2022%5CDocs%5CR1-2208926.zip) Draft CR on MBS supporting  deferring HARQ-ACK for SPS PDSCH CATT
16. [R1-2208927](file:///D%3A%5C2022%5CDocs%5CR1-2208927.zip) Draft CRs for NR Multicast and Broadcast Service CATT
17. [R1-2208928](file:///D%3A%5C2022%5CDocs%5CR1-2208928.zip) Corrections on multicast DCI format to enable/disable HARQ-ACK CATT
18. [R1-2208929](file:///D%3A%5C2022%5CDocs%5CR1-2208929.zip) Discussion on multicast DCI format to enable/disable HARQ-ACK CATT
19. [R1-2208995](file:///D%3A%5C2022%5CDocs%5CR1-2208995.zip) Correction on Type-2 HARQ-ACK codebook for MBS Langbo
20. [R1-2208996](file:///D%3A%5C2022%5CDocs%5CR1-2208996.zip) Correction on Type-3 HARQ-ACK codebook for MBS Langbo
21. [R1-2209137](file:///D%3A%5C2022%5CDocs%5CR1-2209137.zip) Remaining Issues on NR MBS NEC
22. [R1-2209310](file:///D%3A%5C2022%5CDocs%5CR1-2209310.zip) Remaining issues on HARQ-ACK feedback for multicast CMCC
23. [R1-2209311](file:///D%3A%5C2022%5CDocs%5CR1-2209311.zip) Discussion on specs alignment of PDSCH simultaneous reception for MBS CMCC
24. [R1-2209312](file:///D%3A%5C2022%5CDocs%5CR1-2209312.zip) Draft CR on multicast HARQ-ACK codebook type configuration in DCI formats CMCC
25. [R1-2209313](file:///D%3A%5C2022%5CDocs%5CR1-2209313.zip) Draft CR on multicast rate-matching pattern configuration CMCC
26. [R1-2209314](file:///D%3A%5C2022%5CDocs%5CR1-2209314.zip) Draft CR on SPS and dynamic scheduling PDSCH(s) collision for MBS CMCC
27. [R1-2209315](file:///D%3A%5C2022%5CDocs%5CR1-2209315.zip) Draft CR on RRC parameters correction in TS 38.211 CMCC
28. [R1-2209316](file:///D%3A%5C2022%5CDocs%5CR1-2209316.zip) Draft CR on RRC parameters correction in TS 38.212 CMCC
29. [R1-2209317](file:///D%3A%5C2022%5CDocs%5CR1-2209317.zip) Draft CR on RRC parameters correction in TS 38.213 CMCC
30. [R1-2209318](file:///D%3A%5C2022%5CDocs%5CR1-2209318.zip) Draft CR on RRC parameters correction in TS 38.214 CMCC
31. [R1-2209449](file:///D%3A%5C2022%5CDocs%5CR1-2209449.zip) Maintenance on NR Multicast and Broadcast Services LG Electronics
32. [R1-2209470](file:///D%3A%5C2022%5CDocs%5CR1-2209470.zip) Maintenance of broadcast and multicast for MBS ZTE
33. [R1-2209471](file:///D%3A%5C2022%5CDocs%5CR1-2209471.zip) Draft CR on CFR configuration for multicast ZTE
34. [R1-2209472](file:///D%3A%5C2022%5CDocs%5CR1-2209472.zip) Draft CR on terms of G-RNTI used for MTCH ZTE
35. [R1-2209473](file:///D%3A%5C2022%5CDocs%5CR1-2209473.zip) Draft CR on restrictions of simultaneous reception ZTE
36. [R1-2209474](file:///D%3A%5C2022%5CDocs%5CR1-2209474.zip) Draft CR on SPS collision handling ZTE
37. [R1-2209475](file:///D%3A%5C2022%5CDocs%5CR1-2209475.zip) Draft CR on 1 bit NACK-only feedback ZTE
38. [R1-2209476](file:///D%3A%5C2022%5CDocs%5CR1-2209476.zip) Draft CR on determining NACK-only PUCCH in NACK-only mode1 ZTE
39. [R1-2209524](file:///D%3A%5C2022%5CDocs%5CR1-2209524.zip) Corrections on the MBS reception type combinations in TS 38.202 MediaTek Inc.
40. [R1-2209525](file:///D%3A%5C2022%5CDocs%5CR1-2209525.zip) Corrections on the MBS in TS 38.213 MediaTek Inc.
41. [R1-2209526](file:///D%3A%5C2022%5CDocs%5CR1-2209526.zip) Corrections on the MBS in TS 38.214 MediaTek Inc.
42. [R1-2209527](file:///D%3A%5C2022%5CDocs%5CR1-2209527.zip) Remaining issues on NR MBS MediaTek Inc.
43. [R1-2209566](file:///D%3A%5C2022%5CDocs%5CR1-2209566.zip) Remaining issues on NR Multicast and Broadcast Services Apple
44. [R1-2209708](file:///D%3A%5C2022%5CDocs%5CR1-2209708.zip) Maintenance on multicast-broadcast services Samsung
45. [R1-2209822](file:///D%3A%5C2022%5CDocs%5CR1-2209822.zip) Remaining issues for Rel-17 MBS Huawei, HiSilicon, CBN
46. [R1-2209832](file:///D%3A%5C2022%5CDocs%5CR1-2209832.zip) Correction on processing timeline for NACK-only mode2 to TS38.213 Huawei, HiSilicon, CBN
47. [R1-2209833](file:///D%3A%5C2022%5CDocs%5CR1-2209833.zip) Correction on the max data rate for multiplexing MBS and unicast to TS38.214 Huawei, HiSilicon, CBN
48. [R1-2209882](file:///D%3A%5C2022%5CDocs%5CR1-2209882.zip) Draft CR on DAI field in DCI format 4\_2 NTT DOCOMO, INC.
49. [R1-2209883](file:///D%3A%5C2022%5CDocs%5CR1-2209883.zip) Draft CR on HARQ-ACK feedback for SPS GC-PDSCH NTT DOCOMO, INC.
50. [R1-2209884](file:///D%3A%5C2022%5CDocs%5CR1-2209884.zip) Draft CR on NACK-only based feedback for multicast NTT DOCOMO, INC.
51. [R1-2209885](file:///D%3A%5C2022%5CDocs%5CR1-2209885.zip) Draft CR on multiplexing NACK-only based feedback with SR NTT DOCOMO, INC.
52. [R1-2209954](file:///D%3A%5C2022%5CDocs%5CR1-2209954.zip) Draft CR on DCI-indicated enabling/disabling multicast feedback for Type-1 CB Qualcomm Incorporated
53. [R1-2209955](file:///D%3A%5C2022%5CDocs%5CR1-2209955.zip) Draft CR on Type-2 CB for NACK-only multicast feedback Qualcomm Incorporated
54. [R1-2209956](file:///D%3A%5C2022%5CDocs%5CR1-2209956.zip) Draft CR on max data rate per CC in case of FDMed unicast and MBS PDSCHs Qualcomm Incorporated
55. [R1-2209957](file:///D%3A%5C2022%5CDocs%5CR1-2209957.zip) Scaling factor for FDMed unicast and MBS PDSCHs Qualcomm Incorporated
56. [R1-2209958](file:///D%3A%5C2022%5CDocs%5CR1-2209958.zip) Draft CR on upper bound of TBS LBRM in case of FDMed unicast and MBS PDSCHs Qualcomm Incorporated
57. [R1-2209959](file:///D%3A%5C2022%5CDocs%5CR1-2209959.zip) Draft CR on PDSCH processing time required to select PUCCH for NACK-only mode2 based multicast feedback Qualcomm Incorporated
58. [R1-2209960](file:///D%3A%5C2022%5CDocs%5CR1-2209960.zip) Draft CR on multicast PDSCH with a HARQ process with disabled HARQ-ACK feedback Qualcomm Incorporated
59. [R1-2209961](file:///D%3A%5C2022%5CDocs%5CR1-2209961.zip) Draft CR on PDCCH monitoring when overlapping with rate matching patterns Qualcomm Incorporated
60. [R1-2210075](file:///D%3A%5C2022%5CDocs%5CR1-2210075.zip) Correction on MBS SPS ASUSTeK
61. [R1-2210095](file:///D%3A%5C2022%5CDocs%5CR1-2210095.zip) Correction on configurations of G-RNTI and G-CS-RNTI ASUSTeK
62. [R1-2210096](file:///D%3A%5C2022%5CDocs%5CR1-2210096.zip) Correction on configuration of PDSCH aggregation factor for MBS ASUSTeK
63. [R1-2210155](file:///D%3A%5C2022%5CDocs%5CR1-2210155.zip) Correction on HARQ-ACK codebook types in UL DCI formats for scheduling MBS Lenovo
64. [R1-2210156](file:///D%3A%5C2022%5CDocs%5CR1-2210156.zip) Draft CR on HARQ-ACK feedback for PDSCH scheduled by DCI format 4\_1 Lenovo
65. [R1-2210157](file:///D%3A%5C2022%5CDocs%5CR1-2210157.zip) Draft CR on DAI update for multicast DCI formats Lenovo
66. [R1-2210158](file:///D%3A%5C2022%5CDocs%5CR1-2210158.zip) Draft CR on simultaneous configuration of Type-1 HARQ-ACK codebook and dci-enabler for multicast service Lenovo
67. [R1-2210159](file:///D%3A%5C2022%5CDocs%5CR1-2210159.zip) Remaining issues on HARQ-ACK feedback for NR MBS Lenovo
68. [R1-2210173](file:///D%3A%5C2022%5CDocs%5CR1-2210173.zip) Maintenance on NR Multicast and Broadcast Services Ericsson
69. [R1-2210207](file:///D%3A%5C2022%5CDocs%5CR1-2210207.zip) Correction on retransmission schemes for MBS HARQ-ACK feedback to TS38.213 Huawei, HiSilicon, CBN
70. [R1-2210208](file:///D%3A%5C2022%5CDocs%5CR1-2210208.zip) Correction on the channel combinations for MBS UE handling to TS38.213 Huawei, HiSilicon, CBN
71. [R1-2210209](file:///D%3A%5C2022%5CDocs%5CR1-2210209.zip) Correction on the channel combinations for MBS UE handling to TS38.214 Huawei, HiSilicon, CBN
72. [R1-2210210](file:///D%3A%5C2022%5CDocs%5CR1-2210210.zip) Correction on the channel combinations for MBS UE handling to TS38.202 Huawei, HiSilicon, CBN