**3GPP TSG-RAN WG2 Meeting #113 electronic *R2-2100177(Part II)***

**Online, Jan 25 - Feb 5, 2021**

Agenda Item: 8.1.1

Source: MediaTek Inc.

**Title: Summary of Phase-2 discussion of [Post112-e][069][MBS] Delivery mode 2**

Document for: Discussion and decision

# Introduction

This document is to summarize the following email discussion at phase 1 and to kick off the phase-2 discussion:

* [Post112-e][069][MBS] Delivery mode 2 (MediaTek)

      Scope: Progress on solutions CP focus: MCCH or not for PTM configuration. PTM configuration change notification.

      Intended outcome: Report with agreeable proposals / identified open issues

      Deadline: Jan 12 2021 (7:00 UTC)

# Rapporteur summary and proposals based on phase-1 discussion

The following proposals are made based on the email discussion:

**Rapporteur summary-1: According to the feedback provided, clear majority of the companies (21/22) agreed that both idle/inactive UEs and connected mode UEs can receive MBS services transmitted by NR MBS delivery mode 2.**

**Proposal-1: Both idle/inactive UEs and connected mode UEs can receive MBS services transmitted by NR MBS delivery mode 2.**

**Rapporteur summary-2: According to the feedback provided, all companies agreed that the UE receiving Broadcast sessions transmitted by delivery mode 2 is not required to interact with the network before its MBS service reception. Meanwhile, a number of companies replied that the answer is linked to the discussion on Question 3. Some companies assumed that the UE needed to interact with the network before its reception of Multicast sessions transmitted by delivery mode 2 (depending on the discussion on Question 3).**

**Proposal-2a: the UE receiving Broadcast sessions transmitted by delivery mode 2 is not required to interact with the network before its MBS service reception.**

**Proposal-2b: RAN2 discuss if the UE receiving Multicast sessions transmitted by delivery mode 2 is required to interact with the network before its service reception (if Multicast sessions can also be transmitted by delivery mode 2).**

**Rapporteur summary-3: According to the feedback provided, majority companies (14/22) agreed that delivery mode 2 can also support the transmission of multicast sessions. Some companies 6/22 assumed delivery mode 2 only support the transmission of broadcast sessions.**

**Proposal-3: RAN2 discuss if delivery mode 2 can also support the transmission of multicast sessions.**

**Rapporteur summary-4: According to the feedback provided, clear majority companies (20/22) agreed that the two-step based approach (i.e. BCCH and MCCH) as adopted by LTE SC-PTM can be reused for the transmission of PTM configuration for NR MBS delivery mode 2.**

**Proposal-4: The two-step based approach (i.e. BCCH and MCCH) as adopted by LTE SC-PTM is reused for the transmission of PTM configuration for NR MBS delivery mode 2.**

**Rapporteur summary-5: According to the feedback provided, all companies agreed that Alt-1 can be supported for connected UEs to receive the PTM Configuration for MBS services for NR MBS delivery mode 2, i.e. LTE SC-PTM mechanism can be reused. There were some companies (8/22) that indicated the possibility to consider both broadcast and dedicated signaling based reception for PTM Configuration for delivery mode 2. Three replies (among the 8/22) suggested to take broadcast based manner for broadcast service and to take dedicated signaling based manner for multicast service.**

**Proposal-5a: Reuse LTE SC-PTM mechanism for the connected UEs to receive the PTM configuration for NR MBS delivery mode 2, i.e. broadcast based manner.**

**Proposal-5b: RAN2 further discuss if dedicated signaling based reception for PTM configuration is allowed for NR MBS delivery mode 2.**

**Rapporteur summary-6: According to the feedback provided, majority companies (16/22) agreed that MBS SIB, as a regular SIB, can be optionally area specific. However some replies indicated that whether MBS SIB could be area specific should be dependent on the design of MCCH.**

**Proposal-6: The MBS SIB, as a regular SIB, can be optionally area specific.**

**Rapporteur summary-7: According to the feedback provided, more than half companies (12/22) agreed that MCCH can be area specific, which is a network implementation and some of the rest companies (6/22) have no strong view or are not sure. The left companies (4/22) assumed that MCCH should be cell specific.**

**Proposal-7: RAN2 further discuss if MCCH should be cell specific or area specific for PTM configuration of NR MBS delivery mode 2.**

**Rapporteur summary-8: According to the feedback provided, a slight majority companies (14/22) prefer to reuse LTE SC-PTM mechanism (i.e. Broadcast mode based MCCH transmission) or reuse LTE SC-PTM mechanism as the baseline. The rest companies (8/22) select Alt2 (i.e.** **NR MCCH/PTM configuration can be transmitted either by using Broadcast mode or on-demand following network configuration).**

**Proposal-8: Reuse LTE SC-PTM mechanism (i.e. Broadcast mode based MCCH transmission) as the baseline for NR MBS delivery mode 2 and FFS for on-demand based MCCH transmission.**

**Rapporteur summary-9: According to the feedback provided, a number of companies prefer to study the support of multiple MCCH based PTM configuration (including 5 clear supporters and 3 companies that did not show their position explicitly). Meanwhile the rest companies (13/21) prefer to not support multiple MCCH based PTM configuration.**

**Proposal-9: RAN2 further discuss if multiple MCCH based PTM configuration can be supported for NR MBS delivery mode 2.**

**Rapporteur summary-10: According to the feedback provided, the majority companies (21/22) agreed that PTM change notification mechanism can be used to notify the changes of PTM configuration (e.g. carried by MCCH) due to session start for delivery mode 2 of NR MBS. One company did not see the need.**

**Proposal-10: PTM change notification mechanism can be used to notify the changes of PTM configuration (e.g. carried by MCCH) due to session start for delivery mode 2 of NR MBS.**

**Rapporteur summary-11: According to the feedback provided, the majority companies (13/22) agreed that PTM change notification mechanism can be used to notify the changes of PTM configuration (e.g. carried by MCCH) due to other purpose (e.g. modification of the transmission cycle for a service) for delivery mode 2 of NR MBS. However some companies (5/22) commented that it was not LTE SC-PTM approach during the reply. It would be better to take online discussion for the issue.**

**Proposal-11: RAN2 to discuss if PTM change notification mechanism can be used to notify the changes of PTM configuration (e.g. carried by MCCH) due to other purpose (e.g. modification of the transmission cycle for a service) for delivery mode 2 of NR MBS.**

**Rapporteur summary-12: According to the feedback provided, the majority companies (19/22) prefer to take LTE SC-PTM approach as baseline for PTM change notification for delivery mode 2 of NR MBS.**

**Proposal-12: Take LTE SC-PTM approach as baseline for PTM change notification for delivery mode 2 of NR MBS.**

**Rapporteur summary-13: According to the feedback provided, the slight majority companies (13/22) think that it is too early to discuss the enhancement for PTM change notification (i.e. Group based PTM change notification). Meanwhile there are some interests in discussing both Alt1 (Multiple MCCHs based) and Alt2 (Group paging based) or its variants for PTM change notification for delivery mode 2 of NR MBS.**

**Proposal-13: Mark the enhancement for PTM change notification as an open issue for delivery mode 2 of NR MBS.**

**Rapporteur summary-14: According to the feedback provided, a number of companies (13/22) prefer not to support the counting procedure for NR MBS delivery mode 2 for connected mode UEs. However, there are also quite a number companies (7/22) see the need.**

**Proposal-14: RAN2 further discuss if delivery mode 2 support counting procedure for connected mode UEs.**

**Rapporteur summary-15: According to the feedback provided, a number of companies (14/22) prefer not to support the counting procedure for NR MBS delivery mode 2 for Idle/Inactive mode UEs. However, there are also quite a number companies (7/22) see the need.**

**Proposal-15: RAN2 further discuss if delivery mode 2 support counting procedure for Idle/Inactive mode UEs.**

**Rapporteur summary-16: According to the feedback provided, clear majority companies (18/22) prefer not to support counting procedure for Idle/Inactive mode UEs without mandating the UEs to enter RRC connected mode. This can also be revisited after we decide whether to allow Idle/Inactive UEs based counting.**

**Proposal-16: Mark the discussion of the mechanism for counting procedure for Idle/Inactive UEs based counting as an open issue for delivery mode 2 of NR MBS. To be revisited after we decide whether to allow Idle/Inactive UEs based counting.**

**Rapporteur summary-17: According to the feedback provided, clear majority companies (19/22) agreed that MBS Interest Indication can be supported for UEs in connected mode for delivery mode 2. Two companies did not see the need.**

**Proposal-17: MBS Interest Indication is supported for UEs in connected mode for NR MBS delivery mode 2.**

**Rapporteur summary-18: According to the feedback provided, clear majority companies (21/22) agreed that MBS Interest Indication should not be supported for UEs in idle/inactive mode for delivery mode 2.**

**Proposal-18: MBS Interest Indication is not supported for UEs in idle/inactive mode for NR MBS delivery mode 2.**

**Rapporteur summary-19: According to the feedback provided, clear majority companies (16/22) did not see the need to merge the** **MBS Interest Indication with on demand MBS/PTM configuration request procedure for delivery mode 2, even though the support of on demand MBS/PTM configuration request procedure was not decided yet. Three companies see the need. The rest two companies put it FFS.**

**Proposal-19: RAN2 decide if the** **MBS Interest Indication can be merged with on demand MBS/PTM configuration request procedure for delivery mode 2 after the decision on the support of on demand MBS/PTM configuration request procedure.**

**Rapporteur summary-20: According to the feedback provided, clear majority companies (21/22) see the need to have** **service continuity for NR MBS Delivery mode 2. Many companies indicated to follow the same motivation as LTE SC-PTM.**

**Proposal-20: Service continuity is needed for NR MBS Delivery mode 2.**

**Rapporteur summary-21: According to the feedback provided, clear majority companies (20/22) agreed that both USD and system information can be provided for purpose of service continuity for NR MBS Delivery mode 2 (i.e. reuse legacy approach for LTE SC-PTM). Meanwhile, during the reply, many companies indicated that the general principle in SC-PTM can be reused, but the exact content within USD is out of scope of RAN2.**

**Proposal-21: In general, the mechanism to ensure service continuity of LTE SC-PTM is reused for NR MBS Delivery mode 2 (i.e. both USD and system information can be provided for purpose of service continuity).**

**Rapporteur summary-22: According to the feedback provided, clear majority companies (18/22) agreed to support UE awareness of MBS services on frequency basis for service continuity for NR MBS delivery mode 2 (i.e. Reuse LTE SC-PTM mechanism). Meanwhile, some companies (among the companies that did not reply Yes) indicated that LTE SC-PTM already provides the neighbor cell information for the service, i.e., scptm-NeighbourCellList in SC-MCCH (SCPTMConfiguration). However that information was not applied in the criteria of cell reselection for LTE MBMS/SC-PTM.**

**Proposal-22: Support UE awareness of MBS services on frequency basis for service continuity for NR MBS delivery mode 2 (i.e. Reuse LTE SC-PTM mechanism).**

**Rapporteur summary-23: According to the feedback provided, clear majority companies (19/22) agreed to support frequency prioritization during cell reselection for service continuity for NR MBS delivery mode 2 (i.e. Reuse LTE SC-PTM mechanism). Meanwhile, the rest three companies prefer to put is as FFS (depending on the outcome of Q21,Q22).**

**Proposal-23: Support frequency prioritization during cell reselection for service continuity for NR MBS delivery mode 2 (i.e. Reuse LTE SC-PTM mechanism).**

**Rapporteur summary-24: According to the feedback provided, all companies agreed that PTM configuration should include MTCH configuration as LTE SC-PTM. A majority companies (18/22) agreed that PTM configuration should include neighbor cell information as LTE SC-PTM. However, some companies (4/22) questioned the need to have neighbor cell information within PTM configuration. Rapporteur suggests to reuse the high-level concept of LTE SC-PTM service continuity for delivery mode 2, while the details can be left open.**

**Proposal-24: Fdor NR MBS delivery mode 2, PTM configuration can include both MTCH configuration and neighbor cell information.**

# Proposals based on phase 1 discussion

**Proposal-1: Both idle/inactive UEs and connected mode UEs can receive MBS services transmitted by NR MBS delivery mode 2.**

**Proposal-2a: the UE receiving Broadcast sessions transmitted by delivery mode 2 is not required to interact with the network before its MBS service reception.**

**Proposal-2b: RAN2 discuss if the UE receiving Multicast sessions transmitted by delivery mode 2 is required to interact with the network before its service reception (if Multicast sessions can also be transmitted by delivery mode 2).**

**Proposal-3: RAN2 discuss if delivery mode 2 can also support the transmission of multicast sessions.**

**Proposal-4: The two-step based approach (i.e. BCCH and MCCH) as adopted by LTE SC-PTM is reused for the transmission of PTM configuration for NR MBS delivery mode 2.**

**Proposal-5a: Reuse LTE SC-PTM mechanism for the connected UEs to receive the PTM configuration for NR MBS delivery mode 2, i.e. broadcast based manner.**

**Proposal-5b: RAN2 further discuss if dedicated signaling based reception for PTM configuration is allowed for NR MBS delivery mode 2.**

**Proposal-6: The MBS SIB, as a regular SIB, can be optionally area specific.**

**Proposal-7: RAN2 further discuss if MCCH should be cell specific or area specific for PTM configuration of NR MBS delivery mode 2.**

**Proposal-8: Reuse LTE SC-PTM mechanism (i.e. Broadcast mode based MCCH transmission) as the baseline for NR MBS delivery mode 2 and FFS for on-demand based MCCH transmission.**

**Proposal-9: RAN2 further discuss if multiple MCCH based PTM configuration can be supported for NR MBS delivery mode 2.**

**Proposal-10: PTM change notification mechanism can be used to notify the changes of PTM configuration (e.g. carried by MCCH) due to session start for delivery mode 2 of NR MBS.**

**Proposal-11: RAN2 to discuss if PTM change notification mechanism can be used to notify the changes of PTM configuration (e.g. carried by MCCH) due to other purpose (e.g. modification of the transmission cycle for a service) for delivery mode 2 of NR MBS.**

**Proposal-12: Take LTE SC-PTM approach as baseline for PTM change notification for delivery mode 2 of NR MBS.**

**Proposal-13: Mark the enhancement for PTM change notification as an open issue for delivery mode 2 of NR MBS.**

**Proposal-14: RAN2 further discuss if delivery mode 2 support counting procedure for connected mode UEs.**

**Proposal-15: RAN2 further discuss if delivery mode 2 support counting procedure for Idle/Inactive mode UEs.**

**Proposal-16: Mark the discussion of the mechanism for counting procedure for Idle/Inactive UEs based counting as an open issue for delivery mode 2 of NR MBS. To be revisited after we decide whether to allow Idle/Inactive UEs based counting.**

**Proposal-17: MBS Interest Indication is supported for UEs in connected mode for NR MBS delivery mode 2.**

**Proposal-18: MBS Interest Indication is not supported for UEs in idle/inactive mode for NR MBS delivery mode 2.**

**Proposal-19: RAN2 decide if the** **MBS Interest Indication can be merged with on demand MBS/PTM configuration request procedure for delivery mode 2 after the decision on the support of on demand MBS/PTM configuration request procedure.**

**Proposal-20: Service continuity is needed for NR MBS Delivery mode 2.**

**Proposal-21: In general, the mechanism to ensure service continuity of LTE SC-PTM is reused for NR MBS Delivery mode 2 (i.e. both USD and system information can be provided for purpose of service continuity).**

**Proposal-22: Support UE awareness of MBS services on frequency basis for service continuity for NR MBS delivery mode 2 (i.e. Reuse LTE SC-PTM mechanism).**

**Proposal-23: Support frequency prioritization during cell reselection for service continuity for NR MBS delivery mode 2 (i.e. Reuse LTE SC-PTM mechanism).**

**Proposal-24: For NR MBS delivery mode 2, PTM configuration can include both MTCH configuration and neighbor cell information.**

# Company input to Phase 2 discussion

There may be issues on the Rapporteur’s summary and Proposals in previous sections, please show company’s comments at this section.

|  |  |
| --- | --- |
| Company | Comments on Rapporteur’s summary and Proposals  |
| TD Tech&Chengdu TD Tech | Our comments on the above proposals.1. Common to all proposals: SC-MCCH/SC-MTCH is used to indicate the control/traffic channel in NR MBS

During the email discussion, LTE SC-PTM is used to denote the MBS method for SC-PTM in LTE. In the LTE SC-PTM, SC-MCCH and SC-MTCH are used to differentiate LTE SC-PTM from LTE MBSFN. Therefore, we think it’s better to use SC-MCCH/SC-MTCH instead of MCCH/MTCH in LTE MBSFN.1. Proposal 2a/2b: we think these two proposals are updated as below.

**Proposal-2a: the UE receiving Broadcast sessions transmitted by delivery mode 2 is not required to interact with the network for taking session join and/or authentication at NAS layer before its MBS service reception.** **Proposal-2b: RAN2 discuss if the UE receiving Multicast sessions transmitted by delivery mode 2 is required to interact with the network for taking session join and/or authentication at NAS layer before its service reception (if Multicast sessions can also be transmitted by delivery mode 2.**We think the content of the interaction with the network should be added in the proposals 2a and 2b to clarify the conclusions more clearly without excluding the other possible interaction scenarios. For example, a UE in RRC\_IDLE/RRC\_INACTIVE wants to receive an MBS delivered by mode 2, but the PTM configuration of the MBS is NOT OK to the UE ( for instance, the BWP providing the MBS has a wider bandwidth beyond the RF capability of the UE). In order to receive the MBS, a possible method for the UE is to report its interest and RF capability to the network. We think the above scenario for UE in RRC\_IDLE/RRC\_INACTIVE to report its interest and RF capability is NOT excluded and can be discussed later.1. Proposal 3: we suggest to delete “also” from the description of proposal 3.

**Proposal-3: RAN2 discuss if delivery mode 2 can support the transmission of multicast sessions.**1. Proposal 5a:

We think proposal 5a can be updated as below to make the conclusion more clearly.Proposal-5a: Reuse LTE SC-PTM mechanism for the connected UEs to receive the PTM configuration for NR MBS delivery mode 2, i.e. broadcast based manner (by SC-MCCH).1. Proposal 6: we think proposal 6 can be updated as below.

**Proposal-6: The MBS SIB (carrying the SC-MCCH configuration information), as a regular SIB, can be optionally area specific.**1. Question 7 and Proposal 7:

We think question 7 can be updated as below:Do you agree that the PTM configuration (e.g. the PTM configuration of an MBS or the PTM configuration of all MBSs in SC-MCCH) can be area specific for NR MBS delivery mode 2?We think whether or not the PTM configuration of an MBS can be area specific should be discussed here. Correspondingly anther summary can be made as below:**Proposal-7a: RAN2 further discuss if MCCH should be cell specific or area specific for PTM configuration of NR MBS delivery mode 2.****Proposal-7b: RAN2 further discuss if the PTM configuration of an MBS delivered by mode 2 can be cell specific or area specific.**We think concept “the PTM configuration of an MBS” is different from concept “SC-MCCH”.SC-MCCH carries the PTM configuration of each MBS delivered by mode 2. That SC-MCCH is area specific means that the content of SC-MCCH is same in each cell in the corresponding area. That is, the area specific SC-MCCH has the following features.1. Each MBS has the same PTM configuration in each cell in the corresponding area.
2. Each cell in the area provides the same MBSs.

That SC-MCCH is cell specific is obvious: in general, each cell provides the different MBSs. Area specific MCCH can be realized according to the network configuration.For an MBS delivered by mode 2, the PTM configuration of this MBS is cell specific in general. But in order to improve the service continuation of this MBS in the UE mobility scenario and simplify the PTM configuration of this MBS in each cell, the PTM configuration of this MBS can be area specific. According to our understanding, an area specific MBS has the following features:1. The cells in an area can be classified into two groups: each cell in group 1 broadcast this MBS with mode 2 while each cell in group 2 doesn’t broadcast this MBS.
2. The same PTM configuration of this MBS is applied in each cell in group 1.

Therefore, question 7 and proposal 7 need to be updated.We think the PTM configuration of an MBS delivered by mode 2 can be area specific. For example, the PTM configuration of an MBS is same in the current cell and adjacent cells of the current cell. If more than one cells of a GNB-CU need to broadcast this MBS with mode 2, the same PTM configuration can be used in these cells.It's difficult to make SC-MCCH area specific due to the fact that an MBS may be broadcast only in some cells of an area. But if the area is small enough, SC-MCCH can be area specific. From our point of view, the PTM configuration of an MBS can be area specific and such scenarios exist with two examples as below.1. The area consists of the current cell and the adjacent cells of the current cell.
2. The area consists of the cells of a gNB-CU.
3. **Proposal 9:**

**We think there’s the requirement for the different modification periods and the different repetition periods for the different types of MBS. Furthermore, there exist the different methods to satisfy such requirement. Supporting more than one SC-MCCHs is just a possible method. We have another method to satisfy such requirement. Therefore, we hope proposal 9 can be updated as below:****Proposal-9: RAN2 further discuss if the different modification/repetition periods for the different MBS types can be supported for NR MBS delivery mode 2.****Our method is simply described as below.****In our method, only one SC-MCCH is needed to provide the different modification/repetition periods for the different types of MBS.**1. **Configure the modification period and repetition period for each type of MBS. Use Trmin (unit: radio frame) to denote the minimum repetition period among the repetition periods of different types of MBS.**
2. **SC-MCCH is transmitted within each transmission period of Trmin radio frames. SC-MCCH carries the different PTM configuration informations in different transmission periods.**

**For example:** **Trmin=2 raido frames or Trmin=20ms****MBS type 1: Modification/Repetition period is 40ms/20ms,** **MBS type 2: Modification/Repetition period is 160ms/40ms****The transmission period of SC-MCCH is Trmin=20ms long.****For MBS type 1, the repetition period of MBS type 1 is just Tmin radio fames long. In each transmission period, SC-MCCH carries the PTM configuration information of each MBS belonging to MBS type 1.** **For MBS type 2, the repetition period of MBS type 2 is 40ms long. Each 40ms-long repetition period of MBS type 2 includes two 20ms-long transmission periods.****SC-MCCH carries the PTM configuration information of each MBS belonging to MBS type 2 in the first 20ms-long transmission period with the second 20ms-long transmission period not used for MBS type 2.****For MBS type1, the modification period is 40ms long. Each 40ms-long modification period of MBS type1 includes two 20ms-long repetition periods of MBS type 1 and two 20ms-long transmission periods.** **When a new MBS of MBS type 1 is broadcast, the PTM configuration information of this new MBS is sent from the nearest 40ms-long modification period of MBS type 1.****For MBS type 2, the modification period is 160ms long. Each 160ms-long modification period of MBS type 2 includes four 40ms-long repetition periods of MBS type 2 and 8 20ms-long transmission periods.****When a new MBS of MBS type 2 is broadcast, the PTM configuration information of this new MBS is sent from the nearest 160ms-long modification period of MBS type 2.****We hope our method can be provided for discussion. The features of our method are listed below:**1. **Only one SC-MCCH is transmitted: have no influence on the number of SC-MCCHs**
2. **Different MBS types can have the different modification/repetition periods**
* **Satisfy the requirement listed above**
* **save the radio resource compared with the unitary modification/repetition period for all MBS types**
* **save UE power if UE is interested in an MBS with the repetition period larger than the SC-MCCH transmission period**

**（8）Proposal-24:****In LTE SC-PTM, SC-MTCH configuration contains the SC-MTCH scheduling information. But in NR MBS, PDSCH has many parameters. Without these parameters, UE can NOT receive PDSCH. Therefore, we hope proposal 24 is updated as below.** **Proposal-24: For NR MBS delivery mode 2, PTM configuration can include both MTCH configuration and neighbor cell information where MTCH configuration includes** MBS session info, G-RNTI, MTCH scheduling info and PDSCH related information**.** |
| Kyocera | On Proposal 1, in our understanding it was already agreed. So, we think the proposal just intends the clarification of previous agreement, i.e., we don’t think additional discussion is needed. On Proposals 2a/2b, we think RAN2 should only discuss on RAN2 aspects. It’s already clear in the previous agreement that the UE in IDLE/INACTIVE does not need to transition to RRC Connected, just in order to obtain MBS configuration, as CATT pointed out. The UE in Connected may need to send MII as in Proposal 17. The NAS procedures, e.g., session join and authentication that are stated above Question 2, are out of RAN2 scope. On Proposals 10/11, we think LTE SC-PTM mechanism was that “*When the network changes (some of) the SC-MCCH information, it notifies the UEs*” as specified in TS36.331, regardless of whether session start or other purposes. So, we wonder if RAN2 should just reuse this statement. On Proposal 21, we wonder if RAN2 should wait for inputs from other WGs regarding USD before assuming its applicability to service continuity, since USD is out of RAN2 scope.  |
| Xiaomi | For Proposal-6, we consider that the MBS SIB includes the MCCH configuration and optionally includes the service availability information of both the neighbour frequency and the serving frequency. If the MCCH is cell specific, then the MBS SIB should not be area specific. Maybe we could clarify which information in the MBS SIB is area specific or cell specific. For example, we could add “FFS which information in the MBS SIB is area specific” at the end of the Proposal-6. For Proposal-6/7, the meaning of the area is not very clear. I understand that the signalling details of the “area” may need more studies. Maybe the intention of the Proposal-6 and 7 is just trying to say that the MBS SIB/MCCH can be optionally applied to “multiple cells”.For Proposal-20, the intention of the proposal is not clear, and it seems we have already got proposals for the CONNECTED service continuity (i.e. Proposal-17/18/19) and the IDLE/INACTIVE service continuity (i.e. Proposal-23). Maybe this Proposal-20 can be removed. |
| Huawei, HiSilicon | As a general suggestion, we would like to propose that the e-mail discussion rapporteur separates the proposals into those that allow us to establish a baseline and those that are optimizations and should be discussed only after the baseline is agreed. It will be impossible to handle all the proposals and if we discuss everything at once, it will be much harder to achieve progress. We have also some comments on the specific proposals as below.**Proposal-5b: RAN2 further discuss if dedicated signaling based reception for PTM configuration is allowed for NR MBS delivery mode 2.** We are wondering if for P5b the intention is to reuse dedicated SIB delivery mechanism or something different. Reusing the dedicated SIB would allow to cover the use cases mentioned by companies (e.g. UE being in a BWP where it cannot receive SIB) without the need for introducing new configuration option and making MBS more complex.**Proposal-10: PTM change notification mechanism can be used to notify the changes of PTM configuration (e.g. carried by MCCH) due to session start for delivery mode 2 of NR MBS.**The intention is OK, but it would be clearer to speak of “MCCH” change notification, not “PTM” change notification. Similar comment for P11.**Proposal-12: Take LTE SC-PTM approach as baseline for PTM change notification for delivery mode 2 of NR MBS.**This proposal is OK, but it seems the companies have different understanding on how this works in LTE. Please see the following excerpt from 36.300, which clarifies the notification mechanism is only for session start:“- Except for NB-IoT UEs, BL UEs or UEs in enhanced coverage a notification mechanism is used to announce changes of SC-MCCH due to Session Start:- The notification is sent in the first subframe in a repetition period where the SC-MCCH can be scheduled. The notification is sent using the DCI format 1C with SC-N-RNTI and one bit within the 8-bit bitmap;- When the UE receives a notification, it acquires the SC-MCCH in the same subframe;(…)- The UE detects changes to SC-MCCH which are not announced by the notification mechanism by SC-MCCH monitoring at the modification period.” |
| Samsung | Proposal 13During the phase-1 discussion, most companies see no enhancement is needed at this moment. I think proposal can be modified to agree no enhancement for now and revisit if there is a strong reason to have it. |
| CATT | In general, we agreed with Huawei that it make sense to sort out the fundamental proposals for progress, considering the limited time in online session.And comments on the specific proposals are as following,**Proposal-2b: RAN2 discuss if the UE receiving Multicast sessions transmitted by delivery mode 2 is required to interact with the network before its service reception (if Multicast sessions can also be transmitted by delivery mode 2).**Please Rapporteurclarify if the “interact with the network” is limited to RAN level or not. If not, this proposal is not necessary, as It is well known that join procedure for multicast is necessary before service reception.**Proposal-9: RAN2 further discuss if multiple MCCH based PTM configuration can be supported for NR MBS delivery mode 2.**In phase-1 the majority ofcompanies (12/20) prefer to not support multiple MCCH based PTM configuration. Do we still need to discuss it further? **Proposal-10: PTM change notification mechanism can be used to notify the changes of PTM configuration (e.g. carried by MCCH) due to session start for delivery mode 2 of NR MBS.**We think anyway change notification mechanism should be used upon session start, so we suggest that “can be used ” should be change “is used” .**Proposal-12: Take LTE SC-PTM approach as baseline for PTM change notification for delivery mode 2 of NR MBS.**There are two mechanisms in SC-PTM (one is for normal UE, the other is for NB-IOT UEs). So we suggest to add “FFS on down selection between mechanism for normal UEs and for NB-IOT UEs”**Proposal-19: RAN2 decide if the** **MBS Interest Indication can be merged with on demand MBS/PTM configuration request procedure for delivery mode 2 after the decision on the support of on demand MBS/PTM configuration request procedure.**It seems there is no need for RAN2 to decide further on this as there is clear majority view to not support it.As Rapporteur summarized “Clear majority companies (16/21) did not see the need to merge the MBS Interest Indication with on demand MBS/PTM configuration.”**Proposal-24: For NR MBS delivery mode 2, PTM configuration can include both MTCH configuration and neighbour cell information.**We think P24 is not consistent with Rapporteur summary as following,“However, some companies (4/21) questioned the need to have neighbour cell information within PTM configuration. Rapportuer suggests to reuse the high-level concept of LTE SC-PTM service continuity for delivery mode 2, while the details can be left open. ”We should not adopt it if we do not know how to use it. One one hand, Rapporteurdid not answer to question on the need of neighbour cell information and suggest to reuse high-level concept of LTE SC-PTM. One the other hand, Rapportuer directly include the support of neighbour cell information in MCCH in the proposal. |
| OPPO | 1. For proposal 17, we would like to change as below. We agree to report MBS Interesting Indication by UE, but when and how to report need to discuss further. In NR, it is not like LTE, we think the MBS interesting indication maybe also used to aid the network to configure the dedicated BWPs for the UE, not only for Handover. We also think the security requirement may be different from LTE for this information reporting.

**Proposal-17: MBS Interest Indication can be reported to the network ~~is supported~~ for UEs in connected mode for NR MBS delivery mode 2.** 1. For proposal 14 and 15, RAN3 has agreed that counting is not supported. So whether we need to discuss it again?

**Proposal-14: RAN2 further discuss if delivery mode 2 support counting procedure for connected mode UEs.****Proposal-15: RAN2 further discuss if delivery mode 2 support counting procedure for Idle/Inactive mode UEs.****Proposal-16: Mark the discussion of the mechanism for counting procedure for Idle/Inactive UEs based counting as an open issue for delivery mode 2 of NR MBS. To be revisited after we decide whether to allow Idle/Inactive UEs based counting.**1. For proposal 19, we did see the need to support on demand MCCH, why we discuss the merge of MBS interesting indication and on demand MCCH.

I also confused the on-demand means for idle/inactive mode ue or connected mode ue?**Proposal-19: RAN2 decide if the** **MBS Interest Indication can be merged with on demand MBS/PTM configuration request procedure for delivery mode 2 after the decision on the support of on demand MBS/PTM configuration request procedure.** |
| Nokia | P6/7: Area specific discussion is bit premature as we do not have any content for the SIBs. Those should be solved first to see if area specificity is even practical. P14/15: Agree with Oppo. why to discuss in RAN2 if already agreed not supported in RAN3P19: OK to discuss although majority seemed to think this level of optimization is not needed.P21: on high level OK but giving system information as included information is not clear as we likely will not have service areas. So at minimum frequencies should be given in USD to support e.g. frequency prioritization (P23)P24: “neighbour cell information” is quite open ticket and does not give specifics. Probalby best to define actual information or not agree neighbour cell information at this point |
| QC | **Proposal-1: Both idle/inactive UEs and connected mode UEs can receive MBS services transmitted by NR MBS delivery mode 2.**To our understanding, discussion more about Broadcast Service MBS refers to both Multicast and Broadcast. P3 discusses about applicability of mode2 for Multicast. We suggest to change it as “**Both idle/inactive UEs and connected mode UEs can receive ~~MBS~~ Broadcast services transmitted by NR MBS delivery mode 2”****Proposal-2b: RAN2 discuss if the UE receiving Multicast sessions transmitted by delivery mode 2 is required to interact with the network before its service reception (if Multicast sessions can also be transmitted by delivery mode 2).**For Multicast, from SA2 session management procedure it is clear that UE has to join Multicast session via NAS based procedure. This is not RAN2 discussion. This proposal is not in RAN2 scope. |
| vivo | **Proposal-2a: the UE receiving Broadcast sessions transmitted by delivery mode 2 is not required to interact with the network before its MBS service reception.**Considering that all 22 companies share a common understanding that interaction related to session join/leave procedure is not needed for broadcast, thus, we think we don’t need this agreement for clarification. **Proposal-2b: RAN2 discuss if the UE receiving Multicast sessions transmitted by delivery mode 2 is required to interact with the network before its service reception (if Multicast sessions can also be transmitted by delivery mode 2).**If the term “interact” is referred as to session join/leave procedure, it is quite clear that interaction is need for the reception from multicast session. And the session join/leave procedure is studied and specified by SA2, it seems there is no room for RAN2 to discuss. In this sense, this agreement is not needed. **Proposal-5a: Al least reuse LTE SC-PTM mechanism for the connected UEs to receive the PTM configuration for NR MBS delivery mode 2, i.e. broadcast based manner.****Proposal-5b: For the connected UEs, RAN2 further discuss if dedicated signaling based reception for PTM configuration is allowed for NR MBS delivery mode 2.**Just two minor editorial comments.**Proposal-10: PTM change notification mechanism can be used to notify the changes of PTM configuration (e.g. carried by MCCH) due to session start for delivery mode 2 of NR MBS.****Proposal-11: RAN2 to discuss if PTM change notification mechanism can be used to notify the changes of PTM configuration (e.g. carried by MCCH) due to other purpose (e.g. modification of the transmission cycle for a service) for delivery mode 2 of NR MBS.****Proposal-12: Take LTE SC-PTM approach as baseline for PTM change notification for delivery mode 2 of NR MBS.**In our understanding, P10 is covered by P12 and P11 (i.e. LTE SC-PTM for NB-IoT) is contradictory with P12. Maybe we can combine P12 and P10 into one proposal, such as, **Proposal-10: Take LTE SC-PTM approach as baseline for PTM change notification mechanism to notify the changes of PTM configuration (e.g. carried by MCCH) due to session start for delivery mode 2 of NR MBS.****Proposal-20: Service continuity is needed for NR MBS Delivery mode 2.**It seems this is a common understanding amongst all 22 companies. It can be removed. Anyway, the term “need” is a bit obscure, since the phrase “service continuity” is a goal we should achieve, rather than some mechanism or information that needs to be used in delivery mode 2.**Proposal-21: In general, the mechanism to ensure service continuity of LTE SC-PTM is reused for NR MBS Delivery mode 2 (i.e. both USD and system information can be provided for purpose of service continuity).**This proposal is a bit misleading. On one hand, the sentence “In general, the mechanism to ensure service continuity of LTE SC-PTM is reused for NR MBS Delivery mode 2” can cover the following P22/23/24, making us wonder why we still have P22/23/24. On another hand, the meaning of the sentence within the bracket is much more stage-3 than the former sentence. Thus, we propose: **Proposal-21: Both USD and system information for purpose of service continuity can be provided for NR MBS Delivery mode 2.****Proposal-24: For NR MBS delivery mode 2, PTM configuration can include MTCH configuration. FFS neighbor cell information.**During the phase-1 discussion, no company has clarified how to use the list of neighbor cells. Although we think this information is not needed in NR MBS, can put it as FFS now. |
| Convida Wireless | **Proposal-2b: RAN2 discuss if the UE receiving Multicast sessions transmitted by delivery mode 2 is required to interact with the network before its service reception (if Multicast sessions can also be transmitted by delivery mode 2**We have the same comment as others. We likely need to clarify what is meant by “before its service reception.” Our assumption is that this does not include the “join” interaction needed for the multicast session**Proposal-15: RAN2 further discuss if delivery mode 2 support counting procedure for Idle/Inactive mode UEs.****Proposal-16: Mark the discussion of the mechanism for counting procedure for Idle/Inactive UEs based counting as an open issue for delivery mode 2 of NR MBS. To be revisited after we decide whether to allow Idle/Inactive UEs based counting.**Not sure if Proposal 16 is needed at this time, as it relies on Proposal 15 decision.**Proposal-21: In general, the mechanism to ensure service continuity of LTE SC-PTM is reused for NR MBS Delivery mode 2 (i.e. both USD and system information can be provided for purpose of service continuity).**Maybe we should rephrase the proposal to better match the email discussion question:*Do you agree that both USD and system information can be provided for purpose of service continuity for NR MBS Delivery mode 2 (i.e. reuse legacy approach for LTE SC-PTM)?*For example:**Proposal 21: Both USD and system information for purpose of service continuity can be provided for NR MBS Delivery mode 2.****Proposal-22: Support UE awareness of MBS services on frequency basis for service continuity for NR MBS delivery mode 2 (i.e. Reuse LTE SC-PTM mechanism).**Since a number of companies point out that this should be used as a baseline, should this be reflected in the Proposal?For example:**Proposal-22: As a baseline, support UE awareness of MBS services on frequency basis for service continuity for NR MBS delivery mode 2 (i.e. Reuse LTE SC-PTM mechanism).** |
| Futurewei | **Proposal-4: The two-step based approach (i.e. BCCH and MCCH) as adopted by LTE SC-PTM is reused for the transmission of PTM configuration for NR MBS delivery mode 2.**Understand the proposal is based on the majority vote. But it appears the question was asked at the early part of the email discussion. Companies seems not have chance to look into the details, think and discuss more. Based on the comments from the companies, we see some concerns on one step approach but they may not be an issue.Concern 1: MBS configuration change in the SIB will wake up all the UEs including those UEs not interested in MBS. Actually, the SIB can be designed to only wake up the UEs interested in the MBS. Concern 2: MBS scheduling configuration update via SIB is slower than MCCH. This may reduce the performance.It is true. But delivery mode 2 is only used for MBS with low performance requirement. We don’t expect very frequent configuration update needed for those MBS services. The delay of the configuration update is also more tolerable.Concern 3: reuse LTE mechanism maybe better.MBS is first time supported In NR R17, there is no backward compatible issue. NR does not necessarily follow LTE. An additional MCCH is not fit to the existing NR structure. More signal overhead and MBS UE power consumption would be expected.We would suggest to have some more further discussion on the two-step vs one-step (solution B vs B variant). |

# Rapporteur summary and proposals based on phase-2 discussion

**General aspect**: There is a suggestion to categorize the proposals a bit to speed up the discussion to agree a baseline before the discussion on the possible optimizations. Rapporteur understanding is that a baseline can be established only if a batch of proposals can be agreed, where it may be agreed via block approval. Otherwise it can be handled one by one. During the organization of the final proposals, Rapporteur woud try to classify a bit based on the company input and put the controversial proposals as open issues for futher discussion.

In addition, there is a suggestion to polish the term for MCCH/MTCH, Rapporteur did not to see the need to do so in this email summary.

In the following rapporteur summary, some phase one proposals are dropped according to phase 2 company input and then the final proposals based on phase-two summary are renumbered as needed in following three categories:

* Green proposals mean easy proposals
* Yellow proposals mean online discussed needed for them
* Turquoise issues mean open issues for further discussion.

**Proposal-1 of phase one summary:** The company input received during phase 2 discussion shows that this proposal is agreeable. However one company wants to change the term of MBS service to broadcast. In rapporteur understanding, that is subject to the further discussion if delivery mode 2 can also support the transmission of multicast sessions. In the current stage, it is suggested to keep the current wording for P1.

**Proposal-1 of phase two summary: Both idle/inactive UEs and connected mode UEs can receive MBS services transmitted by NR MBS delivery mode 2.**

**Proposal-2a/2b of phase one summary:** The company input received during phase 2 discussion shows that both proposals are controversial. Some companies indicated that question 2 i.e. the base of both proposals is the UE-NW interaction discussion based on NAS procedures (e.g. session join and authentication), however the discussion should focus on RAN2 aspects. For Proposal-2b, mulitple companies indicate that for Multicast, it is clear that, in SA2 session management procedure, UE has to join Multicast session via NAS based procedure and this is not in RAN2 scope. Based on the discussion above, In rapporteur understanding, both Proposal-2a and Proposal-2b is not needed.

**Proposal-3 of phase one summary:** The company input received during phase 2 discussion shows that this proposal is agreeable. But the proposal itself is an open issue. One company wants to remove the “also” in order to polish the wording. Just recall the discussion at phase one, there was a slight majority support for the issue(14/22). Rapporteur suggests to discuss it online.

**Proposal-2 of phase two summary: RAN2 discuss if delivery mode 2 can support the transmission of multicast sessions.**

**Proposal-4 of phase one summary:** The company input received during phase 2 discussion shows that there is one company that has concern on the two-step based approach (i.e. BCCH and MCCH) for mode 2. Rapporteur suggests to take proposal-4 as was. Note that this proposal is very essential to establish a baseline for futher discussion of delivery mode-2.

**Proposal-3 of phase two summary: The two-step based approach (i.e. BCCH and MCCH) as adopted by LTE SC-PTM is reused for the transmission of PTM configuration for NR MBS delivery mode 2.**

**Proposal-5a/5b of phase one summary:** The company input received during phase 2 discussion for Proposal-5a shows that broadcast based manner can be used as the baseline for UE to receive the PTM configuration for delivery mode 2. However, there is a question if the dedicated signaling within Proposal-5b is SIB based signaling. The answer is no. The mentioned dedicated signaling is RRC based dedicated signaling and then it may be only applicable to RRC connected UEs.If we recall the discussion at phase one, the company reply shown that dedicated signaling based reception for PTM configuration should be open for futher discussion. Then Rapporteur suggests the following reworded proposal and open issue as phase two summary:

**Proposal-4 of phase two summary: As a baseline, reuse LTE SC-PTM mechanism for the connected UEs to receive the PTM configuration for NR MBS delivery mode 2, i.e. broadcast based manner.**

**Open issue 1** **of phase two summary: RAN2 further discuss if dedicated signaling based reception for PTM configuration is allowed for NR MBS delivery mode 2.**

**Proposal-6/7 of phase one summary:** The company input received during phase 2 discussion for Proposal-6/7 indicate that the discussion on area specific aspect for MBS SIB and MCCH is premature before we know the exact content of the MBS SIB and MCCH. Then Rapporteur suggests the following open issue as phase two summary:

**Open issue 2** **of phase two summary: RAN2 further discuss the area specific of MBS SIB and MCCH when** **the exact content of the MBS SIB and MCCH is defined**.

**Proposal-8 of phase one summary:** There is no company input received during phase 2 discussion for Proposal-8. Then Rapporteur suggests the same propsoal as phase two summary:

**Proposal-5 of phase two summary: Reuse LTE SC-PTM mechanism (i.e. Broadcast mode based MCCH transmission) as the baseline for NR MBS delivery mode 2 and FFS for on-demand based MCCH transmission.**

**Proposal-9 of phase one summary:** During phase 2 discussion, one company indicated the possibility to take one MCCH to announce different type of MBS services with diverse modification periods and repetition periods. Proposal-9 itself is open. Then Rapporteur suggests reword it as an open issue as phase two summary:

**Open issue 3** **of phase two summary:RAN2 further discuss the need and the method of PTM configuration to handle diverse requirement of different MBS service for NR MBS delivery mode 2 e.g. multiple MCCH based PTM configuration, one MCCH with diverse modification periods and repetition periods, etc.**

**Proposal-10/11/12 of phase one summary:** During phase 2 discussion, the feedback provided by a number of companies shows that there are some confusions. The most controversial debate is whether or not MCCH change notification only announces change of MCCH due to session start. The current stage 2 description (36.300) constrains the change notification to be only applicable to session start based MCCH change. However, the current stage 3 description (36.331) does not capture that constraint. It is unclear why that constraint is needed at all.

One company mentioned that in LTE there are two different mechanisms, one for general LTE SC-PTM, and the other for NB-IoT/eMTC UEs. Rapporteur wants to clarify that the orginal intention of our discussion is based on LTE SC-PTM.

One company mentioned that P10/P11 may be covered by P12. Rapporteur wants to clarify that P10/P11 focus on the discussion on the purpose of MCCH change notification but P12 focus on the exact mechanism used to perform MCCH change notification. Rapporteur thinks that the current wording of P12 does not capture the original intention during phase one discussion. The orginal intention is to confirm the following LTE SC-PTM mechanism for NR MBS delivery mode 2:

*In LTE SC-PTM, the change notification of the MBMS control information is sent in the first subframe in a Repetition Period where the SC-MCCH can be scheduled. The notification is sent using the DCI format 1C with SC-N-RNTI. When the UE receives the notification, it will acquire the updated SC-MCCH.*

However during the phase one and phase two discussions, several companies mentioned the possibility to down select from LTE SC-PTM mechanism and NB-IoT/eMTC mechanism for MCCH change notification. Note also that the purpose of NB-IoT/eMTC mechanism covers both session start based MCCH configuration change and the change caused by other cases.

In addition, both general LTE SC-PTM mechanism and NB-IoT/eMTC mechanism for MCCH change notification captured in stage 2 specs (TS 36.300) were provided by RAN1. The decision can probably be made by RAN1 in this case. RAN2 can provide our preference to use legacy MCCH change notification for NB MBS delivery mode 2 and then ask RAN1 to decide the way forward based on the two legacy MCCH change notification mechanisms.

Then Rapporteur suggests to keep P10/P11 with some rewording and change P12 to a new proposal as follows:

**Proposal-6 of phase two summary: MCCH change notification mechanism is used to notify the changes of MCCH configuration due to session start for delivery mode 2 of NR MBS.**

**Proposal-7 of phase two summary: RAN2 to discuss if MCCH change notification mechanism can be used to notify the changes of MCCH configuration due to other purpose (e.g. modification of the transmission cycle for a service) for delivery mode 2 of NR MBS.**

**Proposal-8 of phase two summary**: **RAN2 has a preference to use legacy MCCH change notification for NB MBS delivery mode 2 and then send LS to RAN1 to ask them to decide the detailed mechanism based on general LTE SC-PTM mechanism and NB-IoT/eMTC mechanism for MCCH change notification.**

**Proposal-13 of phase one summary:** During phase 2 discussion, one feedback suggests to close the discussion on enhancement of PTM change notification. However as can be seen during phase one discussion, there were interests from multiple companies on the topic. Rapporteur suggests to mark it as an open issue for further discussion.

**Open issue 4** **of phase two summary: Further discuss on the need and the method of the enhancement for PTM change notification for delivery mode 2 of NR MBS.**

**Proposal-14/15/16 of phase one summary:** During phase 2 discussion, the feedback provided by the companies shows that RAN3 has already ruled out of counting procedure for NR MBS. However in rapporteur understanding, the counting procedure discussed by RAN2 is based on air interface and then should be in RAN2 scope. Recalling Phase one discussion, there are diverse views on the topic. In addition, there is a comment that challeges the need of P16 during phase 2 discussion. Based on company input at phase 2, Rapporteur suggests to put counting as an open issue to cover P14/P15/P16.

**Open issue 5** **of phase two summary: Further discuss on the need and the method of counting procedure for connectec UEs and Idle/Inactive UEs for delivery mode 2 of NR MBS.**

**Proposal-17/18/19 of phase one summary:** During phase 2 discussion, the feedback provided by the companies shows that both P17 and P18 can be agreeable. However the company reply shows that the discussion on P19 is optimization, and it depends on the discussion of the support of On-demand MCCH. One company wants to discuss when and how to perform MBS Interest Indication. Rapporteur suggests to focus on the current discussion at stage-2 level. In phase-2 summary, Rapporteur suggests to keep P17/P18 and remove P19 for now.

**Proposal-9 of phase two summary: MBS Interest Indication is supported for UEs in connected mode for NR MBS delivery mode 2.**

**Proposal-10 of phase two summary: MBS Interest Indication is not supported for UEs in idle/inactive mode for NR MBS delivery mode 2.**

**Proposal-20 of phase one summary:** During phase 2 discussion, the feedback provided by the companies shows that P20 is a common understanding of the companies and there are other proposals that discuss the details of service continuitiy issue. In phase-2 summary, Rapporteur suggests to remove P20 to simplify the online discussion.

**Proposal-21 of phase one summary:** During phase 2 discussion, the feedback provided by the companies shows that P21 should be rewored to match the question casted during phase one discussion. One company indicated that USD is out of RAN2 scope and RAN2 may not be able to assume that USD can be used for service continuity. Rapporteur understanding of SA2 discussion is that it still assumes the similar USD applicability as LTE. In phase-2 summary, Rapporteur suggests to reword P21 according to company reply as below.

**Proposal-11 of phase two summary:Both USD and system information for purpose of service continuity can be provided for NR MBS delivery mode 2.**

**Proposal-22 of phase one summary:** During phase 2 discussion, the feedback provided by one company suggests to reword the proposal with “as a baseline”. In phase-2 summary, Rapporteur suggests to reword P22 according to company reply as below.

**Proposal-12 of phase two summary: As a baseline, support UE awareness of MBS services on frequency basis for service continuity for NR MBS delivery mode 2 (i.e. Reuse LTE SC-PTM mechanism).**

**Proposal-23 of phase one summary:** During phase 2 discussion, no feedback is received for P23. Rapporteur suggests to keep P23 as phase two summary.

**Proposal-13 of phase two summary: Support frequency prioritization during cell reselection for service continuity for NR MBS delivery mode 2 (i.e. Reuse LTE SC-PTM mechanism).**

**Proposal-24 of phase one summary**: Mulitple companies provided feedback during phase 2 discussion for P23. One company wants to indicate the detailed MTCH configuration (MBS session info, G-RNTI, etc). Rapporteur suggests to discuss the detailed configuration in a later stage. keep P23 as phase two summary. Three companies commented that neighbor cell information should be a open discussion. One company wants to clarify the need of neighbor cell information. Rapporteur understanding is that the list of neighboring cells is useful to achieve service continuity. Rapporteur suggests to keep P24 as phase two summary.

**Proposal-14 of phase two summary**:**: For NR MBS delivery mode 2, PTM configuration can include both MTCH configuration and neighbor cell information.**

# Categorized Proposals based on phase-2 summary

**Proposal-1 of phase two summary: Both idle/inactive UEs and connected mode UEs can receive MBS services transmitted by NR MBS delivery mode 2.**

**Proposal-2 of phase two summary: RAN2 discuss if delivery mode 2 can also support the transmission of multicast sessions.**

**Proposal-3 of phase two summary: The two-step based approach (i.e. BCCH and MCCH) as adopted by LTE SC-PTM is reused for the transmission of PTM configuration for NR MBS delivery mode 2.**

**Proposal-4 of phase two summary: As a baseline, reuse LTE SC-PTM mechanism for the connected UEs to receive the PTM configuration for NR MBS delivery mode 2, i.e. broadcast based manner.**

**Open issue 1** **of phase two summary: RAN2 further discuss if dedicated signaling based reception for PTM configuration is allowed for NR MBS delivery mode 2.**

**Open issue 2** **of phase two summary: RAN2 further discuss the area specific of MBS SIB and MCCH when** **the exact content of the MBS SIB and MCCH is defined**.

**Proposal-5 of phase two summary: Reuse LTE SC-PTM mechanism (i.e. Broadcast mode based MCCH transmission) as the baseline for NR MBS delivery mode 2 and FFS for on-demand based MCCH transmission.**

**Open issue 3** **of phase two summary:RAN2 further discuss the need and the method of PTM configuration to handle diverse requirement of different MBS service for NR MBS delivery mode 2 e.g. multiple MCCH based PTM configuration, one MCCH with diverse modification periods and repetition periods, etc.**

**Proposal-6 of phase two summary: MCCH change notification mechanism is used to notify the changes of MCCH configuration due to session start for delivery mode 2 of NR MBS.**

**Proposal-7 of phase two summary: RAN2 to discuss if MCCH change notification mechanism can be used to notify the changes of MCCH configuration due to other purpose (e.g. modification of the transmission cycle for a service) for delivery mode 2 of NR MBS.**

**Proposal-8 of phase two summary**: **RAN2 has a preference to use legacy MCCH change notification for NB MBS delivery mode 2 and then send LS to RAN1 to ask them to decide the detailed mechanism based on general LTE SC-PTM mechanism and NB-IoT/eMTC mechanism for MCCH change notification.**

**Open issue 4** **of phase two summary: Further discuss on the need and the method of the enhancement for PTM change notification for delivery mode 2 of NR MBS.**

**Open issue 5** **of phase two summary: Further discuss on the need and the method of counting procedure for connectec UEs and Idle/Inactive UEs for delivery mode 2 of NR MBS.**

**Proposal-9 of phase two summary: MBS Interest Indication is supported for UEs in connected mode for NR MBS delivery mode 2.**

**Proposal-10 of phase two summary: MBS Interest Indication is not supported for UEs in idle/inactive mode for NR MBS delivery mode 2.**

**Proposal-11 of phase two summary:Both USD and system information for purpose of service continuity can be provided for NR MBS delivery mode 2.**

**Proposal-12 of phase two summary: As a baseline, support UE awareness of MBS services on frequency basis for service continuity for NR MBS delivery mode 2 (i.e. Reuse LTE SC-PTM mechanism).**

**Proposal-13 of phase two summary: Support frequency prioritization during cell reselection for service continuity for NR MBS delivery mode 2 (i.e. Reuse LTE SC-PTM mechanism).**

**Proposal-14: For NR MBS delivery mode 2, PTM configuration can include both MTCH configuration and neighbor cell information.**

# References

1. *[Post112-e][069][MBS] Delivery mode 2 (MediaTek) \_ Phase 1 summary\_v3*