**3GPP TSG-RAN WG2 Meeting #113 electronic *R2-200wxyz***

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

Agenda Item: 8.1.x.x

Source: MediaTek Inc.

**Title: 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 (19/20) 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, a slight majority companies (13/20) agreed that delivery mode 2 can also support the transmission of multicast sessions. Some companies 5/20 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 (18/20) 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 (7/20) that indicated the possibility to consider both broadcast and dedicated signaling based reception for PTM Configuration for delivery mode 2. Three replies (among the 7/20) 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 (14/20) 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, half companies (10/20) agreed that MCCH can be area specific, which is a network implementation and some of the rest companies (6/20) have no strong view or are not sure. The left companies (4/20) 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 (12/20) 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 (8/20) 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 (11/19) 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 (19/20) 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 (13/20) 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 (4/20) 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 (17/20) 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 (12/20) 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 (11/20) 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 (7/20) 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 (12/20) 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 (7/20) 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 (16/20) 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 (18/20) 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 (19/20) 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 (15/20) 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 (19/20) 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 (18/20) 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 (16/20) 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 (17/20) 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 (16/20) agreed that PTM configuration should include neighbor cell information as LTE SC-PTM. However, some companies (4/20) 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: For NR MBS delivery mode 2, PTM configuration can include both MTCH configuration and neighbor cell information.**

# Proposals

**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.

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| Company | Comments on Rapporteur’s summary and Proposals |
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# References

1. *[Post112-e][069][MBS] Delivery mode 2 (MediaTek) \_ Phase 1 summary\_v1 Rapp*