3GPP TSG-RAN WG2 Meeting #115-e ***R2-210xxxx***

Electronic Meeting, August 16 – 27, 2021

**Agenda item:** 8.1.3.1

**Source:** Xiaomi Communications

**Title:** Report of [AT115-e][047][MBS] Service Continuity deliver mode 2

**Document for:**  Discussion

# 1. Introduction

This document summarizes the following email discussion:

* [AT115-e][047][MBS] Service Continuity deliver mode 2 (Xiaomi)

      Scope: Continue discussion on R2-2108799. Reach agreements as far as possible, can also define FFSes when helpful.

      Intended outcome: Agreements, report

      Deadline: Wednesday W2 (CB if needed)

Deadline: Tuesday 2021-08-24 2200 UTC

The RAN2 agreements made in Wednesday 2021-08-19 are quoted as follows:

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| **For IDLE / INACTIVE:**   * The UE is allowed to prioritize the MBS frequency of interest when the cell of the MBS frequency provides MBS SIB carrying the MCCH configuration, as LTE SC-PTM. * The UE is allowed to prioritize the MBS frequency of interest when the UE is only capable of receiving the MBS service by camping on the MBS frequency, as LTE SC-PTM. |

## 1.1 Contacts

Contact person for each participating company:

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# 2. Discussion

## 2.1 Service continuity for delivery mode 2

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| **Potential agreements: (The following agreements can be revisited when there is a problem due to the feedbacks from other working groups.)**  **For IDLE/INACTIVE:**  **Proposal 3: The UE may consider cell reselection candidate frequencies at which it cannot receive the MBS service to be of the lowest priority during the MBS session, as LTE SC-PTM. (25/25)**  **Proposal 4a: The mapping between frequency and MBS service ID (e.g. SAI) is provided in the upper layer signalling (e.g. USD), as LTE SC-PTM. The detailed information included in the upper layer (e.g. USD) is up to the decision of other WGs. (18/25)**  **Proposal 4b: Send an LS to SA2 and SA4 to check whether the mapping between frequency and MBS service ID (e.g. SAI) is provided in the upper layer signalling (e.g. USD), as LTE SC-PTM. (13/25)**  **Proposal 5: The mapping between frequency and MBS service ID (e.g. SAI) is provided in SIB, as LTE SC-PTM. The detailed mapping is pending for the feedbacks of other WGs. (25/25)**  **Proposal 6: The mapping between frequency and MBS service ID (e.g. SAI) is allowed to be sent in cells not broadcasting MBS service, as LTE SC-PTM. (25/25)**  **Proposal 7: The mapping between frequency and MBS service ID (e.g. SAI) is provided in a new SIB different from the MBS SIB providing the MCCH configuration, as LTE SC-PTM. (23/25)**  **Proposal 8a: A group ID (e.g. SAI) of MBS services is provided in SIB and USD, as LTE SC-PTM. The details of the group ID is pending for the feedbacks of other WGs. (20/24)**  **Proposal 8b: Send an LS to SA2, SA4 and RAN3 to check whether an ID (e.g. SAI) of MBS services can be provided in SIB and USD, as LTE SC-PTM. (20/24)**  **Proposal 9: The gNB may indicate a list of neighbour cells where ongoing broadcast MBS service provided in the current cells are also provided, as LTE SC-PTM. How to use the list of neighbour cells in the APP layer is out of RAN scope. (22/24)**  **Proposal 13: The extra offset to cell (which provides the MBS service) for the cell ranking criterion is not supported in Rel-17. (20/21)**  **For CONNECTED:**  **Proposal 10: The UE reports the following MBS interest information (as LTE SC-PTM):**   * **MBS frequency list (20/24)** * **priority between the reception of all listed MBMS frequencies and the reception of any unicast bearer (23/24)** * **TMGI list (24/24)**   **Proposal 11: If MBS frequencies are allowed to be reported, the MBS frequencies reported by the UE is sorted by decreasing order of interest, as LTE SC-PTM. (25/25)**  **Proposal 12: Send an LS to SA3 to check whether the MBS interest information can be reported by the UE before security activation. (17/25)**  **Proposal 14: Send an LS to RAN1 to check whether a UE is capable of receiving PTM simultaneously via multiple serving cells or via both serving cell and non-serving cell, within a band combination. (5/24)**  **Proposal 15: FFS whether the frequencies in MII means that the UE shall be capable of simultaneously receiving MBS on the frequencies, as LTE SC-PTM. Wait for the feedbacks from RAN1 on the simultaneous MBS reception capability.**  **Proposal 16: FFS whether the frequencies in MII shall belong to the same band combination, as LTE SC-PTM. Wait for the feedbacks from RAN1 on the simultaneous MBS reception capability.**  **Proposal 17: FFS whether the MII is reported via *UEAssistanceInformation* or a new RRC message.** |

For Proposal 9, the guidance for the UE application layer is removed, as it does not touch any 3GPP specification. The FFS issues of Proposal 15 and Proposal 16 are added due to the discussion on the following questions:

* Question 12: When a list of frequencies are indicated in MII, should the UE be capable of simultaneously receiving MBS on the set of MBS frequencies of interest (regardless of whether a serving cell is configured on each of these frequencies or not), as LTE SC-PTM?
* Question 13: When a list of frequencies are indicated in MII, should the set of MBS frequencies of interest be part of a band combination of the UE, as LTE SC-PTM?

The above proposals are based on the majority views in R2-2108799 [1]. The number of majority companies are dominant, due to the eagerness of reusing the LTE SC-PTM baseline. Companies which object any of the above Proposals are encouraged to provide the detailed technical obstacles on why the LTE SC-PTM baseline cannot be reused. Wording improvement are welcome as always.

#### **Question: Which of the above Proposals from P3 to P16 are not acceptable to you?**

(The proposal number indicated in the “Answer” column will be considered as an objection to the Proposal. Companies only providing wording improvement are invited to provide the rewording in the “Comments” column without indicating the Proposal number in the “Answer” column, so as to avoid misunderstandings.)

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| **Company** | **Answer**  **(P3 – P16)** | **Comments** |
| Ericsson | P3, P5, P6, P7, P9, P13, P10, P11 | P3, P5, P6, P7, P9, P13:  We would prefer to resolve existence, availability, and function of USD, SAI, higher layer signalling etc. before deciding on a design which assumes availability of such. That is, we ask other groups for information before making decisions. The agreement in RAN2#113 states that we need to revisit this topic based on progress in other groups. Therefore it makes sense to send the LSs now and design later.   * Assume that some information for purpose of service continuity can be provided for NR MBS delivery mode 2. (FFS what – need to be revisited, e.g. based on progress in other groups, e.g. USD, SAI/TMGI etc)   P10, P11:  We think only TMGI is necessary. Other parameters can be FFS.  [Rap-1] P13 does not rely on the progress in other groups. For the sake of progress, P3, P5, P6, P7, P9, P10, P11 which could be considered as working assumption can be revisited after receiving feedbacks from other groups.  Regarding P10 and P11, it is not clear why other parameters are not need unlike LTE. Probably companies can provide more technical reasons. |
| Qualcomm |  | In order to make progress in RAN2, these proposals can be agreed or use them as working assumptions. Based on LS reply received from other WGs, we can always revisit them if needed. |
| LGE | P9/P10/P11 | P9) If a single neighbour cell list is provided as in LTE SCPTM, UE should read MCCH of neighbour cells to verify whether the broadcast session of interest is provided from the cell during cell reselection. If the neighbour cell list is provided per broadcast session provided by serving cell, UE can perform the cell reselection without reading MCCH of neighbour cell. Therefore, it would be better to provide the neighbour cell list per broadcast session.  [Rap-1] The UE does not need to read the MCCH of neighbour cells. As explained, Proposal 9 as in LTE is to allow the UE to initiate the unicast PDU session immediately after the reselection, when the reselected cell does not provide the MBS service interested by the UE. LGE seems proposing some other functions different from LTE, which could be discussed later based on company’s contributions.  P10) If gNB knows the MCCH of neighbour cells, i.e. which neighbour cell provides which broadcast session, MBS frequency doesn’t need to be reported by UE.  [Rap-1] Whether the list of information (e.g. MBS frequency and TMGI) in Proposal 10 are reported together or separately can be discussed based on company’s contributions.  P11) If the ordering is required, the TMGI reported by the UE can be sorted by decreasing order of interest.  [Rap-1] This could be discussed based on company’s contributions. |
| Rap-1 |  | We are open to make some agreements as working assumption, if companies have very strong concern on the feedbacks from other working groups.  Regarding the comments from LG, it seems those are new issues which have not been discussed in the email discussion, and can be discussed later based on company contributions. Listing issues not discussed during the last  post-meeting email discussion seems difficult. |
| TD Tech, Chengdu TD Tech | Maybe proposal 6 | 1. **For all related proposals, the clarification for the mapping between frequency and MBS service shall be added before the description of all proposals to make the related proposals more clear. As shown below, we suggest that the clarification is added before the item “Potential agreements” and applied to each related proposal.**   **In the related proposals below, the mapping between frequency and MBS service indicates the frequency which provides the associated MBS service or supports the associated SAI, where each cell using the frequency provides the associated MBS service or belongs to the associated SAI.**  **Potential agreements:**  **……**  **Potential working assumptions:**  **……**   1. **For proposal 6: As we know, the mapping between the frequency and MBS service is provided in SIB 15 in LTE SC-PTM. We don’t understand why such mapping will be provided in a cell not supporting MBS. From our point of view, if a cell doesn’t support MBS, it will not support SIB15 which is introduced for MBSFN and applied to both MBSFN and SC-PTM. Maybe proposal 6 can be updated as below?**   **Proposal 6: The mapping between frequency and MBS service is allowed to be sent in cells supporting MBS function but with no MBS transmission (no MBS session is now broadcasting in the cell).**  **[Rap-2] The SIB15 provided in a cell not providing MBS service can also help the UEs at the edge of MBSFN to find its interested MBS service in a neighbouring frequency.**   1. **For proposal 10, the following update is suggested**   **Proposal 10: The UE reports the following MBS interest information (as LTE SC-PTM):**   * **MBS frequency** * **priority between MBS bearer and unicast bearer** * **TMGI list**   [Rap-2] frequency and TMGI should be list. |
| Kyocera |  | We can accept all the proposals since these are the majority’s view, although some of them are not what we prefer, e.g., P13 is different from LTE.  Just for wording improvement, we’re wondering if P3 can be aligned with the LTE wording, i.e., to be changed to “**The UE ~~is allowed to set~~ may consider cell reselection candidate frequencies at which it cannot receive the MBS service to be of the lowest priority during the MBS session, as LTE SC-PTM.**”, since “set” is a bit unclear to us.  [Rap-2] Ok for the rewording. |
| Samsung |  | We accept all the proposals for the progress of the WI |
| CATT | P6,P9,P10/P15/P16 | 1) For P6, The cell not capable of MBS belongs to “cells not supporting MBS transmission”. A cell not supporting MBS feature is not supposed to transmit MBS related information.  [Rap-2] Changed to “cell not broadcasting MBS service”.  2) We agree with the intention to reuse the SC-PTM mechanism as much as possible. But it is a bit strange to firstly agree to adopt them in NR MBS before we agree on the purpose/how to use them in NR MBS. E.g.,     * For P9, It seems companies have different understanding on how to use the list of neighbour cells where ongoing MBS service provided. Is it used for mobility between MBS cell to MBS cell, or for mobility from MBS cell to non-MBS cell?   [Rap-2] As explained before, this is for mobility from MBS cell to non-MBS cell as LTE.   * In P10, it is proposed to include MBS frequency in MII message. On the other hand, we even do not know what does the frequencies in MII means, according to P15/P16.   [Rap-2] The frequencies firstly mean the frequencies resources which provide the MBS services interested by the UE. As explained before, “the frequency is determined when the SAI of the frequency in the SIB matches the SAI in the USD” in LTE. P15 and P16 is to only allow the UE to report the MBS frequencies, when the UE is capable of receiving MBSs simultaneously on these frequencies. This is to limit the number of frequencies reported by the UE. As explained before, When the UE reports a list of frequencies in MII, the set of MBS frequencies of interest needs to fulfil the following conditions:   * Condition 1: The UE is capable of simultaneously receiving MBS on the set of MBS frequencies of interest. * Condition 2: At least one band combination includes the set of MBMS frequencies of interest. |
| Nokia | Comments on details of P5, P8,  P9 and P10 | P5: In LTE there is no mapping between services and frequencies only mapping between MBMS SAIs and frequency.  [Rap-2] Changed to “**The mapping between frequency and MBS service ID (e.g. SAI)**”.  P8: we should not talk about group ID but just and “ID (e.g. SAIs)  [Rap-2] Ok for the rewording.  P9: I guess intention is to say that it should be possible to advertise MBS services in neighbour cells. It would not be mandated e.g. legacy gNB would not be able to advertise.  [Rap-2] We could add “the gNB may…”  P10: This much of information prior security activation is likely not acceptable for SA3 from security point of view. We should also consider an indication prior to MII, which just indicates that a UE is receiving some broadcast service, when moving to connected state prior security activation. This is to avoid NW reconfiguring BWP so that UE is not able to receive broadcast as NW would likely not receive detailed MII until security is activated. Then the priority between unicast bearer and MBS bearer is bit vague in the proposal – Does it mean that whenever new unicast bearer is configured UE needs to indicate again what are priorities. Should this proposal more talk about priority between unicast and MBS reception not per bearer information as the UE could be interested in multiple MBS broadcast services?  [Rap-2] We would agree that if the MII prior to security activation is not allowed by SA3, we may need to consider other ways to avoid service interruption, when the UE receiving MBS is transitioning from IDLE/INACTIVE to CONNECTED.  The description on the priority between MBS and unicast is changed to “**priority between the reception of all listed MBMS frequencies and the reception of any unicast bearer**”. This is to provide the service-level priority. |
| NEC | P9 | P5 needs further clarification, whether the ongoing MBS service is supported by multicast, unicast, or both.  [Rap-2] I guess you mean P9. This ongoing MBS service is broadcast MBS service. |
| Apple | P9, P12 | For P9, some clarification is needed on the UE operation to use this neighbor cell’s information.  [Rap-2] The UE operations are in the APP layer which is out of the scope of 3GPP. We can add the clarification sentence back if companies consider the clarification on the UE implementation is really needed.  For P12, it’s obvious that all the information reporting (including MII) before security activation will have the security risk. We are not sure whether MII reporting before security activation is really needed.  [Rap-2] LTE eMBMS allows the MII to be reported before security activation, so as to reduce the service interruption at the transition from IDLE to CONNECTED. However as some companies consider that this NR should apply more strict security rules. It is better to double check with SA3. On the other hand, if MII reporting is not allowed before security activation, some other solutions may be needed to reduce service interruption. |
| CMCC |  | Most of the proposals reuse LTE SC-PTM solutions, we are fine to accept for the progress of the WI. |
| Lenovo, Motorola Mobility |  | P4 and P8 seem a bit overlapped? E.g. MBS services in USD.  [Rap-2] P4 is to ask on the provisioning of “**the mapping between frequency and MBS service**” in USD. P8 is to ask on the provisioning of SAI. Companies can provide better wording while drafting the LS out.  P10 may need further clarification as companies commented, we are fine to have is as WA.  Other proposals seem agreeable to us, we don’t have strong objection. It is also reasonable to send LS to other WGs consulting relevant questions. |
| TCL | Proposal 10 | For proposal 10, we agree on service IDs and frequency list. However, for the priority indication; we think it wold be better to consider the reception modes agreed in RAN1 (i.e., unicast (PTP) or MBS (PTP/PTM) or simultaneous reception of unicast (PTP) and MBS via PTP/PTM in a slot or different slots in a TDM manner). Under such an assumption, we think it would be better to provide an explicit indication of these three reception modes instead of priority indication. Such a kind of indication could assist gNB to decide/select the best way to provide MBS to UE (e.g., via unicast or via MBS, via PTP or PTM or both). Additionally, it may also help gNB to avoid providing MBS service multiplexed with unicast for UEs who are not interested in simultaneous reception especially in the case of broadcast service reception in connected mode (which is indeed a great favour for those specific UEs).  [Rap-2] I assume RAN2 can have the TMGI agreed in the first place. Other information can be discussed later when there is sufficient support. |
| OPPO | None | All proposals are acceptable for us. |
| Intel |  | We’re OK to accept all proposals as agreements or working assumptions to progress RAN2 work. |
| Interdigital |  | We accept all the proposals for the progress of the WI and enhancements like the offset in proposal 13 can be reconsidered in future releases. |
| Futurewei |  | We presume P5, 6, 7 meant to adopt SIB 15 in LTE SC-PTN. If it is correct, we would suggest to make the proposals clear. For example, consider to modify P5 to:  **Proposal 5: The list of the neighbouring frequencies supporting MBS service is provided in SIB, as SIB 15 in LTE SC-PTM.**  **[Rap-2] As the frequencies listed in SIB15 includes both intra and inter frequencies, using only the neighbouring frequency seems not correct. As it is already mentioning “as LTE SC-PTM”, it is clear from LTE that the SIB is SIB15.**  We suggest to make similar modifications also on P6, 7.  [Rap-2] Same comments as provided above.  If P5, 6, 7 suggest anything different from SIB 15 in LTE, then they need to be further clarified and discussed.  [Rap-2] As **it is already mentioning “as LTE SC-PTM”, P5/6/7 is not suggesting anything different from LTE SIB15. Only whether the SAI can be provided is unclear. We would anyway send an LS to SA to double check the provisioning of SAI.** |
| ZTE | P4  P5  P13  P10  P11 | P4.  - If an LS needs to be sent out, we shall include our concerns/background info from RAN perspective (also in the RAN2 agreements), e.g., per frequency deployment is strongly coupled with MBSFN which is excluded in Rel-17, per frequency is not favored and we need further confirmation from other WGs, etc.  [Rap-2] Although SC-PTM is designed for (Single Cell), the LTE SC-PTM also uses the frequency information for service continuity. As RAN2 would anyway send the LS out to SA, the concerns on the frequency information could also be discussed in other working groups. If we don’t send the LS to SA2/4, we cannot know what information is included in USD.  P5.  - Agree with Nokia, it is about SAI and frequency, rather than Service and frequency.  [Rap-2] Changed to “**The mapping between frequency and MBS service ID (e.g. SAI)**”.  P6 with rewording suggestion (the cell will have to be a Rel-17 cell to support broadcasting the new SIB but there is no real transmission for various reasons: lack of capacity/deployment choice/not in the area of broadcast):  - The mapping between frequency and SAI is allowed to be sent in cells without MBS transmission, as LTE SC-PTM.  [Rap-2] Changed to “**cells not broadcasting MBS service**”.  P8 with rewording suggestion: ID instead of group ID sounds good, SAI is not really a group ID.  [Rap-2] ok with the rewording.  P13  - if P9 is agreed (neighbouring cell service availability), & we confirm that Broadcast can be of higher priority than unicast (or connection), we see no reason not to leave this open to enable the flexibility for operators.  [Rap-2] Due to the very limited time in Rel-17, we would suggest we discuss this later in Rel-18, as most companies do not consider this as an urgent enhancement.  P10  - MBS frequency which was for MBSFN is not needed in NR MBS.  [Rap-2] Ok to let this as FFS.  P11  - TMGI list is sorted by decreasing order of interest.  [Rap-2] This was not discussed in the post-meeting email discussion, and not included in LTE SC-PTM. We would suggest to discuss this enhancement based on company’s contributions. |
| Rap-3 |  | We could try another round to make further progresses on the agreements, by identifying the specific aspects which may be impacted by other WGs’ inputs. |
| Sharp |  | We accept all the proposals for the progress of the WI |
| vivo | P10/11/1516 | For P10:  Generally, we think it is gNB’s responsibility to implement the frequencies providing broadcast services (e.g. the mapping between broadcast service and MBS frequency). In this sense, indicating TMGIs in MBS interest indication is sufficient (i.e. there is no need for indicating MBS frequency). Thus, we propose,  **Proposal 10: The UE reports the following MBS interest information:**   * **priority between MBS bearer and unicast bearer** * **TMGI**   Similarly, we propose the updated P11/15/16  **Proposal 11: The TMGIs reported by the UE is sorted by decreasing order of interest.**  **Proposal 15: FFS whether the TMGI in MII means that the UE shall be capable of simultaneously receiving. Wait for the feedbacks from RAN1 on the simultaneous MBS reception capability.**  **Proposal 16: FFS whether the frequencies associated with TMGIs that included in MII shall belong to the same band combination. Wait for the feedbacks from RAN1 on the simultaneous MBS reception capability.** |
| Convida |  | In order to allow the work item to advance, we do not have any strong objection to the list of proposals and working assumptions. However, we do have the following comments/recommendations for the existing list:  P6: There is a difference of opinion on what is meant by the term “cells not supporting MBS transmission”. In our view, this should be clarified before agreeing to the proposal   * Some companies think that this refers to the case that the cell “supports” MBS, but is not actively transmitting any MBS service (for example in cases where we may have dynamic broadcast areas). * For other companies, this seems to refer to R17 cells that do not “support” MBS * It is also not clear if some companies feel that both interpretations are correct.   P9: There is a difference of opinion on how the neighbour cell list will be used. In our view, this should be clarified before agreeing to the proposal   * We agree with CATT that it seems that some companies intend to use this for MBS-cell to MBS-cell mobility, while other companies intend to use this for MBS-cell to non-MBS cell mobility. * We should also discuss the details of the contents of the neighbour cell list – or this should at least be considered as FFS in the proposal   P13: We do feel that providing the extra offset to cell (which provides the MBS service) for the cell ranking criterion, would permit dynamic broadcast areas. As this may need to be revisited, maybe after getting some guidance from other WGs, we believe that it may be prudent to make P13 a working assumption rather than a proposal |

# 3. Summary

# 4. Reference

[1] [R2-2108799](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_115-e\Docs\R2-2108799.zip) Summary of [Post114-e][073][MBS] Service continuity for Delivery Mode 2 (Xiaomi) Xiaomi Communications discussion Rel-17 NR\_MBS-Core