3GPP TSG-RAN WG3 #111e R3-21xxxx

Online, 26 Jan- 5 Feb 2021

Agenda Item: 22.2.5

Source: Lenovo, Motorola Mobility (moderator)

Title: Summary of Offline Discussion on MBS Transmission Area

Document for: Approval

# Introduction

This paper provides summary of offline discussion on MBS transmission area.

**CB: # 74\_MBS\_TXarea**

**CATT**

**On NG-C interface, MBS service area info (e.g. a list of cell ID) should be indicated in the NGAP MBS session resource signaling for local multicast session.**

**On F1 interface, which cells to provide MBS service (e.g. a list of cell IDs) should also be indicated in the F1AP MBS session resource signaling for Multicast session.**

**introduce a concept of MBS Transmission Area.**

**introduce a concept of Multicast Transmission Area, to distinguish from the Multicast sevice area from SA2.**

**introduce a concept of Broadcast Transmission Area, and it is determined by MBS service area provided by 5GC.**

**Len,Moto**

**Within a gNB-DU, the gNB-DU can schedule the multicast traffic among multiple cells using a same G-RNTI and radio resources among these cells (i.e. called MC-PTM mode).**

**It is up to the gNB-CU makes the decision on which modes is configured to the UE i.e. PTP mode only, SC-PTM mode only, MC-PTM mode only, or both PTP and SC-PTM/MC-PTM modes.**

**It is up to the gNB-CU makes the decision on the MBS data transmission area of a MBS session.**

**MBS data transmission mode and MBS transmission area management are achieved by MBS Bearer Setup or MBS Bearer Modification procedure:**

**- The data transmission area (which is a cell or a cell list) is included in MBS BEARER SETUP REQUEST message.**

**\*\*\*\*\***

**- continue discussion on whether to introduce MBS transmission area; try to converge on general principles (maintain alignment with CB on architecture)**

**- avoid unnecessary details**

(Len - moderator)

Summary of offline disc [R3-211030](Inbox\R3-211030.zip)

# For the Chairman’s Notes

The following proposals can be agreed:

Propose the following:

R3-20xxxa, R3-20xxxc merged

R3-20xxxc rev [in xxxg] – agreed

R3-20xxxd rev [in xxxh] – agreed

R3-20xxxe rev [in xxxi] – agreed

R3-20xxxf rev [in xxxj] – endorsed

Propose to capture the following:

**Agreement text…**

**Agreement text…**

**WA: carefully crafted text…**

**Issue 1: no consensus**

**Issue 2: issue is acknowledged; need to further check the impact on xxx. May be possible to address with a pure st2 change. To be continued…**

# Discussion

The agreements in RAN3#110e:

* Broadcast session is associated with Broadcast service area which is provided by 5GC.
* On NG-C interface, Broadcast service area info (e.g. a list of cell IDs) is indicated in the NGAP MBS session resource signaling, for broadcast sessions. FFS for multicast session

The agreements in RAN3#109e:

* An MBS session is denoted by an MBS session identifier unique within the PLMN
* For multicast, the gNB determines the area in which MBS user data needs to be provided by knowledge of the UEs that have joined the MBS Session
* For multicast, the area in which MBS user data needs to be provided may be further limited by the multicast service area; input from SA2 expected
* For multicast, the area in which the MBS user data needs to be provided is deduced from UE Context data

## MBS service area for multicast session over NG interface

As discussed in RAN3#110e, it is still FFS on whether service area is needed for multicast session on the NG interface. As discussed in [1], according to the SA2 discussion, in order to support local MBS service, application function needs to be able to provide the local service area to 5GC and NG-RAN to ensure the local MB service can be delivered within some certain areas. Therefore, on NG-C interface, MBS service area info (e.g. a list of cell ID) also should be indicated in the NGAP MBS session resource signaling for local multicast session.

**Question 1: Do you agree that MBS service area info (e.g. a list of cell ID) should be indicated in the NGAP MBS session resource signaling for local multicast session on NG interface?**

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| --- | --- | --- |
| Company | Yes/No | Comment |
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## MBS transmission area for multicast session in RAN

As discussed in [2], for PTM, there may be two modes SC-PTM and MC-PTM. In SC-PTM mode, the gNB schedules the multicast traffic in a single cell via a cell specific G-RNTI. In the MC-PTM mode, the gNB schedules the multicast traffic among multiple cells using a same G-RNTI and radio resources among these cells. To improve the system performance, both SC-PTM and MC-PTM should be allowed. And the MC-PTM is network implementation and transparent to UEs.

**Question 2: Do you agree that the gNB-DU can schedule the multicast traffic among multiple cells using a same G-RNTI and radio resources among these cells (i.e. called MC-PTM mode)?**

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| Company | Yes/No | Comment |
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In the [2], it is further proposed that because the he gNB-CU have full information (e.g. the UE distributions), for a single UE, the gNB-CU makes the decision on which modes is configured to the UE i.e. PTP mode only, SC-PTM mode only, MC-PTM mode only, or both PTP and SC-PTM/MC-PTM modes.

**Question 3: if the answer is yes to Q2, do you agree that it is up to the gNB-CU makes the decision on which modes is configured to the UE i.e. PTP mode only, SC-PTM mode only, MC-PTM mode only, or both PTP and SC-PTM/MC-PTM modes.**

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| --- | --- | --- |
| Company | Yes/No | Comment |
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As discussed in [1], for F1 interface, given that multicast session support dynamic join/leave mechanism, and when an UE wants to join a session, it initiates RRC connection establishment procedure, so that the NG-RAN can knows the MBS context for the UE. Furthermore, the gNB-CU is the terminating point for RRC protocol and NG signaling connection. Therefore, the gNB-CU can know the real transmission area for multicast sessions, then it needs to notify gNB-DU over the F1 interface which cells to provide the MBS services. [2] also proposed that for SC-PTM and MC-PTM, the multicast area should also be selected. It could be better the gNB-CU makes the decision on the multicast area.

**Question 3: Do you agree to introduce the concept of multicast transmission area in RAN? Please companies provide your views.**

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| --- | --- | --- |
| Company | Yes/No | Comment |
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**Question 4: Do you agree that the gNB-CU decides the multicast transmission area and sends it to gNB-DU in F1-AP signalling?**

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| Company | Yes/No | Comment |
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More specifically, a definition of multicast transmission area is provided in [1] as the MBS transmission area for multicast session.

* Multicast transmission area: The area within which data of one or multiple Multicast session(s) are actually provided in RAN. The NG-RAN determines the area by knowledge of the UEs that have joined the MBS Session and deduction from UE Context data.

**Question 5: Do you agree the above definition of multicast transmission area for multicast sessions?**

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| Company | Yes/No | Comment |
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## MBS transmission area in RAN for broadcast session

[1] proposes to introduce a broadcast transmission area in RAN for broadcast session and the definition of broadcast transmission area is provided as:

* Broadcast transmission area: The area within which data of one or multiple Broadcast session(s) are actually provided in NG-RAN. And it is determined by MBS service area provided by 5GC.

**Question 6: Do you agree to introduce the concept of broadcast transmission area in RAN? Please companies provide your views.**

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| Company | Yes/No | Comment |
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**Question 7: if the answer to Q6 is Yes, do you agree the above definition of broadcast transmission area?**

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| Company | Yes/No | Comment |
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# References

1. R3-210462 Further Consideration on MBS Transmission Area (CATT)
2. R3-210621 (TP for BL CR 38.401) MBS Transmission Area Control between gNB-CU and gNB-DU (Lenovo, Motorola Mobility)