3GPP TSG-RAN WG3 #113e R3-214215

Online, 16 – 26 August 2021

Agenda Item: 22.2.5

Source: Lenovo, Motorola Mobility (moderator)

Title: Summary of Offline Discussion on MBS Service Area Management

Document for: Approval

# Introduction

This paper provides the summary of offline discussion:

**CB: # MBS5\_ServiceAreaMgmt**

**- Agree to use the same concept as LTE MBMS Service Area with MBMS Service Area Identities?**

**- Standard impact on supporting the multicast service available within a limited area?**

**- Capture agreements if any**

(Lenovo - moderator)

Summary of offline disc in [R3-214215](https://ericsson-my.sharepoint.com/personal/alexander_vesely_ericsson_com/Documents/Documents/3GPP/TSG_RAN/WG3/TSGR3_113-e/Inbox/Drafts/CB %23 MBS5_ServiceAreaMgmt/Inbox/R3-214215.zip)

# For the Chairman’s Notes

**Agreements:**

Working assumption: A list of area IDs is used for identifying MBS service area of a broadcast session. The details of this list is FFS (list of SAIs, list of TAIs, or something else).

The basic principle for Xn-based handover of multicast service available within a limited area:

* Source gNB provides the MBS service area information (e.g. cell list or tracking area list) to target gNB in Handover Request message as a part of MBS session context.
* The target gNB performs MBS session admission control according to the MBS service area information.
* If the UE is no longer in the MBS service area in the target gNB, the target gNB rejects to establish the MBS session.

**To be continued:**

**Handover procedure for multicast service with the location-dependent content needs further study.**

# Discussion – 1st Round

In LTE, the MBMS Service Area consists of a list of one or several MBMS Service Area Identities and where each MBMS Service Area Identity is frequency agnostic and can be mapped onto one or more cells. The MBMS Service Area Identities are configured in eNB per cell. The eNB provides the information to MCE and MCE forwards it to MME. The MBMS GW and MCE can provide MBMS service data transmission filtering based on the mapping between cells and MBMS Service Area.

In LTE, the MBMS Service Area is also used for mobility purpose. To avoid the need to read MBMS related system information and potentially (SC-)MCCH on neighbour frequencies, the UE is made aware of which frequency is providing which MBMS services via MBSFN or SC-PTM through the combination of the following MBMS assistance information:

- user service description (USD): in the USD, the application/service layer provides for each service the TMGI, the session start and end time, the frequencies and the MBMS service area identities belonging to the MBMS service area;

- system information: MBMS and non-MBMS cells indicate in *SystemInformationBlockType15* the MBMS SAIs of the current frequency and of each neighbour frequency.

The MBMS SAIs of the neighbouring cell may be provided by X2 signalling (i.e. X2 Setup and eNB Configuration Update procedures) or/and OAM. For NR MBS broadcast service, the same mechanism as LTE eMBMS can be reused e.g. for Idle mode mobility and setting MBS Interest Indication.

1. For NR MBS broadcast service, RAN3 agree to use the same concept as LTE MBMS Service Area with MBMS Service Area Identities.

**Question 1: Companies are kindly asked to provide your views on proposal 1 and if you can agree with proposal 1.**

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comment |
| Huawei | Yes | Agree with introduce the same concept as MBMS Service Area Identities. But it should be checked by RAN2/SA2. |
| CATT | Yes | Agree to use the same concept as LTE MBMS Service Area with MBMS Service Area Identities |
| Ericsson |  | If this question concerns the definition of Service Area Identifiers to “shield” the 5GC from cell topology knowledge, we agree to continue discussing in that direction. But we are a bit concerned about what else “the same concept” might imply, given the long introduction above. |
| Samsung |  | Not sure. |
| Qualcomm | Yes | This should be decided by RAN2/SA2. |
| Lenovo, Motorola Mobility | Yes | RAN2 is discussing that ‘Send an LS to SA2, SA4 and RAN3 to check whether a group ID (e.g. SAI) of MBS services can be provided in SIB and USD, as LTE SC-PTM.’ We tend to agree to wait for RAN inputs. |
| Nokia | Yes | Replace “same” by “similar” |

**Moderator’s Summary**: it seems all companies tend to agree that a group ID (e.g. SAI) can be used for identifying MBS service area. Considering the ongoing discussion in RAN2, RAN3 can take a working assumption that a group ID (e.g. SAI) can be used for identifying MBS service area of a broadcast session. The details of the group ID are FFS.

**Proposal 1: Working assumption: A group ID (e.g. SAI) is used for identifying MBS service area of a broadcast session. The details of the group ID are FFS.**

As specified in the section 7.2.4.3.3 of TS 23.247, the Xn based handover procedure for the UE of multicast service available within a limited area:

* Before the Handover, the UE is camping at Source RAN and receiving multicast data corresponding to the MBS Session ID.
* Source RAN includes MBS Session ID and MBS service area to the Target RAN during Handover preparation phase.
* The target RAN responses to Source RAN, with the accepted MBS Session ID. When Target RAN supports 5MBS but the UE is no longer in the MBS service area, Target RAN does not allocate RAN resources for the MBS Session to the UE.
* For Xn handover, if the UE is handed over to a target cell outside the MBS service area, the SMF does not provide the MBS session related information in N2 SM Info to the target RAN.

1. To support the multicast service available within a limited area, the following impacts on Xn based handover are expected:

* Source gNB provides the MBS service area information (e.g. cell list or tracking area list) to target gNB in Handover Request message as a part of MBS session context;
* Target gNB performs MBS session admission control according to the MBS service area information. If the UE is no longer in the MBS service area in the target gNB, the target gNB rejects to establish the MBS session;

**Question 2: Companies are kindly asked to provide your views on proposal 2 and if you can agree with proposal 2.**

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| --- | --- | --- |
| Company | Yes/No | Comment |
| Huawei | Yes | Agree. The proposal complies with TS 23.247. |
| CATT | Yes | The section 7.2.4.3.3 of TS 23.247 is for Local multicast service. We are OK with the proposal, but propose to clarify the scenario. |
| Ericsson |  | we are concerned that such information is always provided via Xn, whereas it would be only needed for the first joined UE to enter the target gNB serving area. We prefer to follow a general approach that the target gNB retrieves this information from the 5GC.  For HO to non-supporting RAN nodes, it would be the source to evaluate whether the target cell is part of the service area. |
| Samsung | Yes | Generally it is fine. But why only Xn? |
| Qualcomm | Yes |  |
| Lenovo, Motorola Mobility | Yes | For Xn handover, the service area information is provided by the source gNB. For NG based handover, the service area information is probably provided by core network. |
| Nokia | OK | Overall OK but target will not deliver the data. Some rewording needed. |

**Moderator’s Summary:** one company prefer that the target gNB retrieves the local service area information from 5GC. The other companies agree with the proposal. For NG based handover, we can continue to discuss it in next meeting. According to the feedback, I would like to suggest to agree the proposal:

**Proposal 2: the basic principle for Xn-based handover of multicast service available within a limited area: Source gNB provides the MBS service area information (e.g. cell list or tracking area list) to target gNB in Handover Request message as a part of MBS session context; Target gNB performs MBS session admission control according to the MBS service area information. If the UE is no longer in the MBS service area in the target gNB, the target gNB rejects to establish the MBS session.**

As specified in the section 7.2.4.2.3 of TS 23.247, the Xn based handover procedure for the UE of local multicast service with the location-dependent content:

* Before the Handover, The UE is camping at Source RAN and receiving multicast data corresponding to the MBS Session ID and Area Session ID.
* Source RAN includes MBS Session ID, Area Session ID and location area to the Target RAN.
* Target RAN determines whether to establish the forwarding resources and multicast distribution for MBS Session ID and Area Session ID provided by Source RAN, based on MBS Session ID, Area Session ID and location area. To determine the forwarding resources for location-dependent contents delivery, Target RAN may only check whether or not the location area ID is the same if Target RAN already established the session context of the multicast session ID.
* Target RAN responses to Source RAN, with the accepted MBS Session ID and Area Session ID. When Target RAN supports multicast, but the UE is no longer in the location area, Target RAN rejects to handover the multicast session with a cause indication.

1. To support the multicast service with the location-dependent content, the following impacts on Xn based handover are expected:

* Source gNB provides the Area Session ID and MBS service area information (e.g. cell list or tracking area list) to target gNB in Handover Request message as a part of MBS session context;
* Target gNB performs MBS session admission control according to the MBS Session ID, Area Session ID and MBS service area information. If the UE is no longer in the MBS service area in the target gNB, the target rejects to establish the multicast session.

**Question 3: Companies are kindly asked to provide your views on proposal 3 and if you can agree with proposal 3.**

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| --- | --- | --- |
| Company | Yes/No | Comment |
| Huawei | Partly Yes | Firstly, the highlighted word should be “with the location-dependent content”.  Secondly, the proposal follows the description in the latest version TS 23.247. However, we think the bullet 2 should be checked by SA2, since the target gNB may simply not establish the data forwarding tunnel rather than reject to establish the multicast session, if the target gNB serves the different Area session(s) of same MBS session. |
| CATT | FFS | The bullet 2 should be checked by SA2, and the content is a little logically unclear. |
| Ericsson | FFS | see our comments above |
| Samsung | FFS |  |
| Qualcomm | FFS |  |
| Lenovo, Motorola Mobility |  | We understand the comments from Huawei. We may need further check the detailed procedure. We tend to agree with to keep it FFS this meeting. |
| Nokia | FFS |  |

**Moderator’s Summary:** Majority prefer to have further study on this proposal.

**Proposal 3: To be continued: handover procedure for multicast service with the location-dependent content.**

# Discussion – 2nd Round

[TBD]

# References

1. R3-213740 Remaining Issues on MBS Service Area Management (Lenovo, Motorola Mobility)