

**Agenda Item:** 4.7  
**Source:** Motorola  
**Title:** Mobility and Service continuity for UEs in MBMS Point-to-multipoint mode  
**Document for:** Discussion and Decision

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## 1 Introduction

Unlike a UE operating in MBSFN mode, a UE operating in MBMS p-t-m mode has to obtain MBMS parameters when it moves from one cell to another before it can start receiving MBMS from the new cell. The MBMS parameters are obtained by first receiving the BCCH and then the MCCH. Depending on the duration between successive MBMS packets and the duration between MCCH repetitions, the UE can miss some data. We examine this issue and consider options to overcome it.

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## 2 Discussion

Suppose the p-t-m MBMS packets are 1500 bytes (typical IP layer MTU) each and the data rate is 384 kbps (typical data rate for video streaming). This configuration requires 32 packets to be transmitted every second; i.e., a packet approximately every 30 ms.

Upon moving from one cell to another with ongoing MBMS service, the UE has to receive relevant information (MBMS service information, RB information and access information) via the MCCH. The sequence of actions to be performed by the UE before it can read the MCCH are: (a) receive synchronization channel of the new cell, (b) read the primary-BCH, (c) read SU-1 to determine timing of other scheduling units, and (d) read scheduling unit that contains information about MCCH. The p-BCH TTI is 40 ms, the SU-1 repetition period is 80 ms and the repetition periods for the other scheduling units are significantly higher. Even with a very aggressive repetition period for the MBMS service information, RB information and access information on the MCCH (eg., 40 ms), the UE can miss several MBMS packets. A short repetition period for MBMS information could result in a substantial overhead. In practice, the repetition period for the service information, RB information and access information is likely to be one second or more, so the UE can miss a large amount of data.

If the UE moves from a cell with an ongoing MBMS service to a cell where the service is not ongoing, it needs to determine support of the service in the new cell, and if it is supported request its transmission. This also requires the UE to acquire the MCCH as in the previous case. The delay in receiving the service from the new cell includes the delay in the previous case and additional delays in establishing the p-t-m bearer.

Below we consider two methodologies for minimizing missed packets and the time to start a service in a new cell.

### 2.1 Providing relevant information prior to cell change

MBMS for Release 7 essentially takes this approach; a “MBMS Neighbor list” can be sent to all UEs receiving MBMS service. The neighbor list provides the UE with PTM bearer configuration of all neighbors. This allows the UE to receive the PTM transmission after moving to a new cell without receiving the

MCCH. Such a neighbor list has to be transmitted quite frequently to be useful and can consume a lot of bandwidth. It also requires substantial exchange of information between the eNBs.

Also note that even with such a neighbor list a UE that arrives in a cell where the particular MBMS service is not ongoing, needs a mechanism to trigger the transmission of the MBMS service in the new cell.

## 2.2 Access mechanism to trigger transmission of relevant MBMS info

When a UE receiving MBMS in p-t-m mode arrives in a new cell, it sends an indication requesting the transmission of all the PTM bearer configurations. The indication could be a RACH preamble transmission with a pre-designated preamble and the network could respond with a message addressed to an 'MBMS-RNTI' containing indication of support for all supported services and PTM bearer information for all services that are ongoing. If the service the UE is interested in is already being transmitted, the UE starts to receive it. Otherwise, if the service is supported, the UE requests the establishment of a bearer for the service.

So, this approach supports both situations: mobility into cell with service ongoing and mobility into cell with service not ongoing. We believe this provides a simple and effective solution to shorten the interruption time in p-t-m MBMS services due to mobility.

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## 3 Conclusion

We have compared the two primary approaches to minimizing the interruption in p-t-m MBMS service due to mobility. Based on the above discussion, we propose that RAN2 agrees on the following:

- A single mechanism shall be used to acquire PTM bearer information in a new cell for an ongoing service and to trigger transmission of a service that is not ongoing.
- PTM bearer information for ongoing services shall not be sent to the UE until after it reselects to the new cell.
- Upon arriving in a new cell, UE shall transmit a pre-designated RACH preamble to request transmission of p-t-m bearer information.

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## 4 References

- [1] 3GPP TS 25.346