**3GPP TSG-WG SA2 Meeting #144E e-meeting *S2-210xxxx***

**Elbonia, April 12 – 16, 2021 (revision of S2-210xxxx)**

**Source: Nokia, Nokia Shanghai-Bell**

**Title: Completing description of location dependent services:**

**Document for: Approval**

**Agenda Item: 8.9**

**Work Item / Release: 5MBS / Rel-17**

*Abstract: This contribution*

# Introduction

The following conclusions for key issue 6 in TS 23.757 are not yet fully captured:

*- If different location-dependent content is provided for an MBS session, the network shall be able to support multiple MB-UPFs as ingress points for an MBS session.*

*NOTE 1: The solution for different location-dependent content can also be applied in a scenario where the same content is provided in distributed islands of the network to enable distinct local distribution trees with local ingress points.*

*-* *Information about the location dependent multicast service may be provided by an AF, or may be configured.*

*- For location dependent MB service, the MB-SMF allocates the Area Session identifier. The Area Session identifiers allocated by different MB-SMFs shall not overlap for a multicast session.*

It is already captured that different MB-UPFs are assigned. This is to allow different ingress points for different location-dependent data sources, and thus different AFs for different location areas within a multicast session should also be allowed to register themselves as data sources

At SA2#143E there was agreement that ETSUN will not be supported in REl-17, although the related PCR to capture this in 29.757 was noted due to disagreement about related implications.

Preliminary discussions identified are some likely 5MBS impacts of ETSUN:

1. I-SMF updates, e.g. to forward UE join requests for multicast
2. Forwarding of multicast data for shared delivery between regions, presumably via I-MB-SMF

There is agreement that this will not be addressed.

However, there is a disagreement whether to include a workaround in Rel-17:

* The concept of location dependent services is already agreed: The same session ID is used to deliver the different content to different locations from different ingress points (internally there is a second area session ID as additional identifier, but the UE is unaware of that)
* This could also be used to deliver the same content to different regions (with one ingress point per region), avoiding problem 2 above. (There is even a Note in the conclusions on key issue 6 about location dependent services reflecting that possibility, added on request of a Chinese operator)
* This is a full workaround for broadcast (issue 1 does not apply), and for multicast at least allows UEs to receive contents in their home regions.
* Only change required: Different MB-SMF as ingress point in different regions required (so far only one MB-SMF and multiple MB- UPFs agreed; update will be required once ETSUN is added anyway); a related Nokia CR [S2-2101022](https://www.3gpp.org/ftp/tsg_sa/WG2_Arch/TSGS2_143e_Electronic/Docs/S2-2101022.zip) was rejected by Ericsson.

Nokia recommends including that workaround in Rel-17

# 2. Text Proposal

It is proposed to agree the following changes for TR 23.757.

6.2 Local MBS service

A Local MBS service is an MBS service provided in one or several MBS service area(s). An MBS service area is identified by a cell list or a tracking area list. Only UEs within the MBS service area may receive content data, while UEs outside the MBS service area are not allowed to receive location specific content. For multicast communication, UEs outside the MBS service area are not allowed to join the MBS service, and UEs moving out of the MBS service area shall be removed from the MBS service distribution list.

A location dependent MBS service is a local MBS service that is provided in several MBS service areas. The location dependent MBS service enables distribution of different content data to different MBS service areas. The same MBS Session ID is used but a different area session ID is used for each location area. The area session ID is used, in combination with MBS Session ID, to uniquely identify the MBS service within the location area. The network is aware of the location-dependent content distribution for the location dependent MBS services, while UEs are only aware of the MBS service. When UEs move to a new MBS service area, content data from the new MBS service area shall be delivered to the UE, and the network ceases to deliver the content data from the old MBS service areas to the UE. Information about different location areas for a location dependent multicast service may be provided by one or several AFs, or may be configured. Different AFs may provide contents for different location areas, and different ingress points for the multicast session are supported for different location areas in a multicast session; different MB-SMFs and/or MB-UPF may be assigned for different location areas in a multicast session.

The area session ID is allocated by MB-SMF in MBS Session Establishment procedure. MB-SMF allocates area session ID for the services area which is unique within the MBS session. MB-SMF needs to further ensure there is no area overlapping for service areas that share the same MBS session ID.

NOTE 1: An example of Location-dependent MBS service is a nationwide weather forecast service with local weather reports.

NOTE 2: Area Session ID is equivalent to Flow ID as specified in TS 23.246 [8].

7.3.4 Support for Local Broadcast Service and Location-dependent Broadcast Service

Editor's note: This clause needs a revisit, e.g. the content can be moved to clause 7.2.1 where the steps are described.

For broadcast sessions, MBS service area is always required.

A location-dependent broadcast service is a local broadcast service is provided in several MBS service areas and enables distribution of different content data to different MBS service areas. A location-dependent broadcast service has a single MBS Session ID (i.e. TMGI). To differentiate different content data for different MBS service areas, each service area has a unique area session ID assigned. In another word, TMGI and area session ID together uniquely identify the local broadcast service. In MBS Session Establishment, MBS Session Release, MBS Session Update, TMGI and area session ID need to present together. Information about different location areas for a location dependent broadcast service may be provided by one or several AFs, or may be configured. Different AFs may provide contents for different location areas, and different ingress points for the broadcast session are supported for different location areas; different MB-SMFs and/or MB-UPF may be assigned for different location areas in a broadcast session

The area session ID is allocated by MB-SMF in MBS Session Establishment procedure. MB-SMF allocates area session ID for the services area which is unique within the MBS session. MB-SMF needs to further ensure there is no area overlapping for service areas that share the same TMGI.