**SA WG2 Meeting #144E (e-meeting) S2-210xxxx**

**April 12 – 16, 2021, Elbonia**

**Source: CATT**

**Title: Multicast session join procedure**

**Document for: Approval**

**Agenda Item: 8.9**

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

*Abstract of the contribution: This contribution proposes some updates to the MBS procedures for UE Join.*

1. Introduction

Some updates to the multicast session join procedures are proposed.

2. Proposal

It is proposed to include the following changes in TS 23.247.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 1st Change \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

#### 7.2.1.3 MBS join and Session establishment procedure

The following steps are executed before the UE requests to join the MBS session:

* The MBS Session has been configured.
* The UE registers in the PLMN and establishes a PDU session.
* The UE has known at least the MBS Session ID of a multicast group that the UE can join, e.g. via announcement.



Figure 7.2.1.3-1: PDU Session modification for UE joining multicast session

1. To join the multicast group, the UE sends an PDU Session Modification Request which contains an MBS Session ID. The MBS Session ID indicates the multicast session that UE wants to join.

2. Based on the received MBS Session ID, the SMF determines that this is MBS Session join request. The SMF authorizes MBS Session join request, see clause 6.1.1.

3. If SMF has no information about the multicast session context for the MBS Session ID, SMF checks at the NRF whether a multicast session context for the MBS Session ID exists in the system, by using Nnrf\_NFDiscovery request (MBS Session ID). If a multicast session context already exists in the NRF, the NRF responses with Nnrf\_NFDiscovery response (MB-SMF ID).

Editor's note: Whether SMF acting as the MB-SMF is needed and how it works if needed is FFS.

Editor's note: More consideration on how to prevent denial of service attack type situation when first UE joining the multicast group, triggers the MB-UPF to join the multicast tree towards the content provider is FFS.

4. By using Nmbsmf\_MBSSession\_Join request (MBS Session ID), SMF interacts with MB-SMF to retrieve multicast QoS flow information of the indicated MBS session.

5. SMF responds to AMF through Nsmf\_PDUSession\_UpdateSMContext response(N2 SM information (PDU Session ID, MBS Session ID, MB-SMF ID, [multicast QoS flow information], updated PDU Session information, [mapping information between unicast QoS flow(s) and multicast QoS flow(s)]), N1 SM container (PDU Session Modification Command)).

 The multicast QoS flow information and the mapping information between unicast QoS flow(s) and multicast QoS flow(s) are included in N2 SM information if the multicast session is active, in order to:

- create a MBS session context for the indicated MBS session in the RAN, if it does not exist already; and

- inform about the relation between the multicast session context and the UE's PDU session context, including the mapping information between the multicast QoS flow(s) and unicast QoS flow(s), to RAN.

 Based on operator policy, the SMF may prepare for 5GC individual MBS traffic delivery fall-back. The SMF maps the received QoS information of the multicast QoS Flow(s) into unicast QoS Flow information, and includes the information of the QoS Flows and the mapping information about the QoS Flows in the SM information sent to RAN.

Editor's note: Details information included in N2 SM information will be aligned with RAN WG3.

Editor's note: Whether it needs to inform about the relation including the mapping information between the multicast context and the UE's PDU session to UE is FFS.

6. The N2 message, which includes the multicast session information and PDU session modification information is sent to the RAN.

 If the MBS is not supported by NG-RAN, 5GC individual MBS traffic delivery may be used. Otherwise, 5GC shared MBS traffic delivery is adopted.

Editor's note: How the NG-RAN's 5MBS capability is made known is FFS.

 The NG-RAN determines that the PDU Session Modification procedure relates to the multicast session indicated by the MBS Session ID.

 If the multicast QoS information is received and the NG-RAN supports MBS, the associated unicast QoS flow information is not used to allocate the radio resource.

NOTE: It is NG-RAN that decides whether radio resource is allocated or not.

 When the NG-RAN receives an MBS Session ID but no MBS Session context exists for that MBS Session ID in the NG-RAN, the NG-RAN use the included MBS Session QoS information to allocate resources to serve this multicast session. Otherwise the indicated MBS Session has been established before. The NG-RAN can use those allocated resource for MBS Session data packet transferring to UE.

7. The RAN, AMF, SMF, and MB-SMF performs resources reservation for individual delivery and shared delivery. The SMF obtains the 5MBS capability of NG-RAN via the accepted multicast QoS information and determines the delivery mode between 5GC and RAN.

Editor's note: Details of establishing the tunnel of 5GC Shared MBS traffic delivery and 5GC Individual MBS traffic delivery is FFS.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* End of Change \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*