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

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

**Source: Huawei, HiSilicon**

**Title: MBS session leave**

**Document for: Approval**

**Agenda Item: 8.9**

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

*Abstract: This document adds MBS leave to the new TS.*

# Background and Introduction

This contribution proposes the related procedures as per the conclusion in clause 8.2 of TS 23.757.

# Proposal

It is proposed to capture the following changes vs. TS 23.247.

\* \* \* \* First change\* \* \* \*

7.1.2 MBS leave and session release

7.1.2.1 General

At any time, the UE can determine to leave the multicast service via NAS signalling (i.e., PDU Session Modification Request).

7.1.2.2 MBS session leave

Figure 7.1.2.2-1: PDU session modification for multicast leave1. The UE sends the PDU Session Modification Request when the UE wants to leave one or multiple multicast services. The PDU Session Modification Request shall include the multicast service to be leaving, i.e. the MBS session ID.

2. The AMF invokes Nsmf\_PDUSession\_UpdateSMContext (SM Context ID, N1 SM container (PDU Session Modification Request with the associated multicast service information (leave indication, MBS session ID)).

If 5GC individual MBS traffic delivery method is used, i.e., if the UE is receiving multicast via the associated unicast PDU session, steps 3 to 11 apply:

 If SMF and MB-SMF are different and the multicast data are not needed to be distributed via unicast distribution within a PDU session to other UEs served by UPF steps 3 to 5 apply, i.e. the shared tunnel between the UPF and MB-UPF is not needed:

3. The SMF invokes Nsmf\_MBSSession\_Update Request (MBS session ID, DL tunnel info release) service operation to MB-SMF to terminate the shared tunnel between the UPF(PSA) and MB-UPF.

4. Based on the information received in step 3, MB-SMF updates the multicast session context identified by the MBS session ID and configures the MB-UPF to no longer distribute multicast data towards UPF.

5. The MB-SMF responds to SMF to through Nsmf\_MBSSession\_Update response.

6. The SMF invokes an N4 Session Modification procedure with the UPF (PSA). The SMF reconfigures UPF to terminate the distribution of multicast data via the unicast PDU session and when steps 3 to 5 were executed also to release the resources for the reception of the multicast data.

 The SMF update the UE with the result of the leave handling. In addition if dedicated QoS flow are used for the unicast transfer of the multicast data, the SMF also update the RAN to remove the multicast QoS flow related information, i.e. the mapped unicast QoS flow information, from the associated unicast PDU Session.

7. The SMF request the AMF to notify the RAN node to release the QoS flows previously used to transport the multicast data using the Namf\_Communication\_N1N2Message (associated PDU Session ID, N2 SM information, N1 SM container) Transfer service operation. In the N2 SM information and N1 SM container, it includes the mapped unicast QoS flow related information.

8. The AMF sends N2 (N2 SM information received from SMF, NAS message (associated PDU Session ID, N1 SM container (PDU Session Modification Command (PDU Session ID , multicast service information (MBS session ID))))) Message to the NG-RAN.

9. The NG-RAN performs the necessary radio resource modification and transports the N1 SM container received in step 8 to the UE.

10. The NG-RAN acknowledges the message received in step 8 by sending the N2 Message (N2 SM information) to AMF.

11. The AMF transfers the N2 SM information session received in step 10 to the SMF via the Nsmf\_PDUSession\_UpdateSMContext service operation.

If 5GC shared MBS traffic delivery method is used, steps 12 to 22 apply:

12. The SMF request the AMF to notify the NG-RAN node that the UE left the indicated multicast group using the Namf\_Communication\_N1N2Message (N1SM container (PDU Session Modification Command (associated PDU Session ID , multicast service information (MBS session ID)), N2 SM information) Transfer service operation.

 In the N2 SM information, it includes the multicast flow information (multicast QoS Flow ID and associated QoS information), and MBS session ID UE want to leave.

NOTE: If the mapped unicast QoS flow information, association between the unicast QoS flow and multicast QoS flow, and multicast QoS flow information (i.e., QoS rules for Multicast QoS flows) in the N1 SM container are added for multicast distribution, then this information also needs to be deleted at this stage.

13. The AMF sends N2 (N2 SM information received from SMF, NAS message (N1 SM container (PDU Session Modification Command (PDU Session ID, multicast service information (MBS session ID))))) Message to the NG-RAN.

14. The RAN use the MBS session ID to remove the UE from the multicast session context. In addition, in the UE context stored in NG-RAN, the related multicast QoS flow and associated unicast QoS flow information are removed. The NG-RAN performs the necessary radio resource modification and transports the N1 SM container received in step 13 to the UE.

If the UE is the last one to leave the indicated multicast service, the RAN release the associated shared downlink tunnel between NG-RAN and MB-UPF, steps 15 to 19 apply.

15. RAN node selects the AMF to reach MB-SMF and signals a N2 Message (MB-SMF ID, MBS session ID) for the Multicast user plane distribution release towards that AMF.

16. AMF invokes the Multicast user plane distribution release request towards the MB-SMF via the Nsmf\_MBS Session\_Release (MBS session ID) Request.

17. For unicast transport of the multicast distribution session, MB-SMF updates the multicast session context identified by the MBS session ID and request the MB-UPF release the corresponding shard downlink tunnel resource.

18. SMF sends a multicast distribution session release response to AMF via the Nsmf\_MBS Session\_Release Response.

19. AMF invokes multicast distribution session release response to NG-RAN node by sending the N2 Message.

20. For the multicast transport of the multicast distribution session, after receive the multicast distribution release response, the NG-RAN sends the IGMP/MLD leave (MBS session ID) message to MB-UPF to stop the MBS data transmission towards this RAN node.

21. The NG-RAN acknowledges the message received in step 13 by sending the N2 Message.

22. The AMF transfers the message received in step 21 to the SMF via the Nsmf\_PDUSession\_UpdateSMContext service operation.\* \* \* \* End of changes \* \* \* \*