**SA WG2 Meeting #140E (e-meeting) S2-200xxxx**

**Aug 19 – Sep 01, 2020, Elbonia (revision of S2-200xxxx)**

**Source: CATT**

**Title: KI #4, Sol #17: Update to resolve ENs**

**Document for: Approval**

**Agenda Item: 8.9**

**Work Item / Release: FS\_5MBS / Rel-17**

*Abstract of the contribution: This contribution proposes updates to solution #17 for Key Issue #4.*

1. Discussion

There are three Editor's notes in solution #17 for Key issue#4, which are listed and discussed as follows:

Editor's note: It is FFS whether there are any other differences in QoS model for MBS services compared to the existing 5G QoS model for unicast services.

The following differences are further identified for the QoS model of MBS services, compared to the existing 5G QoS model for unicast services:

- UPF transmits the PDUs of the MBS Session in a shared or individual tunnel between 5GC and (R)AN.

- When the Alternative QoS Profile(s) is provided for a GBR QoS Flow of the MBS service, the Alternative QoS Profile(s) can be associated with either PTP or PTM delivery method, or both.

- Wireline access network specific 5G QoS parameters do not apply to MBS services.

NOTE: MBS services over non-3GPP access is not specified in this release.

Editor's note: N4 rules needs to be extended to support rules (e.g. packet detection, QoS enforcement and reporting rules) for MBS session.

This should be a NOTE instead of “Editor's note”, and the extension of N4 rules for MBS Session (e.g. packet detection, QoS enforcement and reporting rules of MBS session) needs to be defined in normative phase.

Editor's note: It is FFS whether the AN indicates to the SMF when the AN resources onto which a QoS Flow of MBS service is mapped are switched from multicast/broadcast to unicast (or vice versa).

As described in clause 6.17.1 NOTE 2, AN indicates to the SMF when the AN resources onto which a QoS Flow of MBS service is mapped are switched from multicast to unicast (or vice versa), in order to:

* aid decisions on delivery mode switching in 5GC. For example:

1) When the AN resources for an MBS service are switched to unicast for all the UEs in the NG-RAN, the CN may decide to switch the delivery method from 5GC Shared MBS traffic delivery method to 5GC Individual MBS traffic delivery method.

2) When the AN resources for MBS service(s) are switched to unicast for the UE due to UE mobility (i.e. the UE moves to an NG-RAN not supporting MBS), the CN may decide to switch the delivery method from 5GC Shared MBS traffic delivery method to 5GC Individual MBS traffic delivery method for the UE.

* indicate the cases of AN resource release for MBS service. As specified in TS 23.502 clause 4.3.3.2, "(AN initiated modification) (R)AN shall indicate to the SMF when the AN resources onto which a QoS Flow is mapped are released irrespective of whether notification control is configured." When the AN resources onto which a QoS Flow is mapped are switched from unicast to multicast (i.e. PTP resource is released and PTM resource is established), similar to the case that the AN resources onto which a QoS Flow is mapped are released, AN should indicates to the SMF.
* facilitate the network analytics on MBS services. The network analytics information (e.g. service experience, network performance) may be different, depending on whether the AN resources onto which a QoS Flow is mapped is unicast (i.e. PTP) or multicast (i.e. PTM). That is, the actual delivery method used by the AN (i.e. PTP or PTM delivery method), reported by the RAN to the CN, could be used by the network to make analytics for a complete view of preformance (e.g. resoure efficiency) of MBS services.

Based on the discussion, it is proposed to remove these Editor's notes.

2. Proposal

It is proposed to include the following changes in TR 23.757.

\*\*\*\*\* Start of 1st Change \*\*\*\*\*

## 6.17 Solution #17: QoS support for MBS service

### 6.17.1 Functional description

Editor's note: This clause outlines solution principles and documents any assumptions made.

This solution addresses Key Issue #4 "QoS level support for Multicast and Broadcast communication services" based on the baseline architecture 1 in clause A.1. By addressing the aspects of KI#4, it is complementary to other solutions to KI#1 and #7.

The 5G QoS model as defined in TS 23.501 [2] clause 5.7 also applies to MBS service, with the following differences:

- Reflective QoS is not applicable.

- UPF transmits the PDUs of the MBS Session in a shared or individual tunnel between 5GC and (R)AN.

- When the Alternative QoS Profile(s) is provided for a GBR QoS Flow of the MBS service, the Alternative QoS Profile(s) can be associated with either PTP or PTM delivery method, or both.

- Wireline access network specific 5G QoS parameters do not apply to MBS services.

NOTE 1: MBS services over non-3GPP access is not specified in this release.

During MBS session establishment procedure, either triggered by the network starting an MBS session or by the UE joining an MBS session, the AF provides MBS session information to the PCF, including QoS requirements for the MBS service data flows. Based on the MBS session information, the PCF determines PCC rules for the MBS session, which includes QoS parameters for multicast/broadcast mode and optionally QoS parameters for unicast mode to e.g. facilitate delivery mode switching in the CN or the NG-RAN. The SMF, based on PCC rules from the PCF for the MBS session (if dynamic PCC is deployed) or local policy (if dynamic PCC is not deployed), determines the QoS profiles and N4 rules for the MBS session with QoS parameters for multicast/broadcast mode and for unicast mode, and provides to the RAN and the UPF respectively.

NOTE 2: The PCF provisions PCC rules to the SMF serving the MBS session and the SMF serving the PDU session associated with the MBS session, which can be the same SMF or different SMFs depending on the solution/conclusion to Key Issue#1 "MBS session management".

NOTE 3: N4 rules needs to be extended to support rules (e.g. packet detection, QoS enforcement and reporting rules) for MBS session.

In the DL, the UPF performs QoS enforcement based on N4 rules for the MBS session provided by the SMF. The AN binds the QoS Flows of the MBS session to AN resources (i.e. multicast/broadcast Radio Bearers or unicast Data Radio Bearers in the case of 3GPP RAN). It is up to the AN to establish the necessary AN resources that QoS Flows for MBS service can be mapped to, to dynamically switch between the multicast/broadcast and unicast AN resources for QoS Flows of MBS service, and to release them. The AN shall indicate to the SMF when the AN resources onto which a QoS Flow of MBS service is mapped are released or switched from multicast/broadcast to unicast (or vice versa).

NOTE 4: The AN indicates to the SMF when the AN resources onto which a QoS Flow of MBS service is mapped are switched from multicast/broadcast to unicast (or vice versa), in order to e.g. aid decisions on delivery mode switching in 5GC, indicate the cases of AN resource release for MBS service, and/or facilitate the network analytics on MBS services.

### 6.17.2 Procedures

Editor's note: This clause describes high-level procedures and information flows for the solution.

### 6.17.3 Impacts Analysis

AF:

- The AF provides the MBS session information including QoS requirements to the PCF.

PCF:

- The PCF provides PCC rules for the MBS session, which includes QoS parameters for multicast/broadcast mode and optionally QoS parameters for unicast mode, to the SMF.

SMF:

- The SMF determines the QoS profiles and N4 rules for the MBS session with QoS parameters for multicast/broadcast mode and for unicast mode, and provides to the RAN and the UPF respectively.

UPF:

- The UPF performs QoS enforcement based on N4 rules for the MBS session.

NG-RAN:

- The NG-RAN binds the QoS Flows of the MBS session to AN resources (i.e. multicast/broadcast Radio Bearers or unicast Data Radio Bearers). The NG-RAN indicates to the SMF when the AN resources onto which a QoS Flow of MBS service is mapped are released or switched from multicast/broadcast to unicast (or vice versa).

\*\*\*\*\* End of Changes \*\*\*\*\*