**3GPP TSG-WG SA2 Meeting #146E e-meeting *S2-210xxxx***

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**Source: Huawei, HiSilicon**

**Title: Combine MBS session parameter provisioning**

**Document for: Approval**

**Agenda Item: 8.9**

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

*Abstract: This contribution combines the parameter provisioning procedures with/without PCC.*

# 1. Introduction/Discussion

This document addresses the following issues:

* **How to organize the clauses for session configuration**

Current TS 23.247 clause 7.1.1, we separately describes the procedures with deploying dynamic PCC and without deploying dynamic PCC. However, both procedures are similar in essence and most of the steps are the same, therefore the real differences between the procedures with/without PCC could be obscured in such description style. To improve the readability, it is proposed to keep a separate clause for dynamic PCC deployed but only capture the "delta" part.

* **Terminology clarification**

MBS Service Area: in clause 7.1.1.1, MBS Service Area is also used by the AF to provide the targeted area for the MBS service, and it could be geographical area information or civic address information, therefore it would be good to clarify that besides cell list or TA list, the MBS SA could also be geographical area information or civic address information.

MBS Service Type: the term used to differentiate the 5GS communication service. It is proposed to include MBS service type description in 3.1, and align the usage of this term in current specification.

* **Leftover Editor's Notes**

For initial configuration with dynamic PCC, It is ffs whether to defer those steps to wait for a policy update.

Since MB-SMF has no knowledge of whether the default QoS parameters will be used, and in order to simplify the MB-SMF design, it is proposed that "For broadcast MBS session, this policy information update may further trigger the MBS Session Update procedure for broadcast defined in clause 7.3.3."

* **Session removal with PCC**

In order to 1) make use of the procedures of session removal without PCC as much as possible, 2) simplify the design of PCF services, and 3) avoid the confusion of "termination of PCF association causes the removal of MBS session" it is proposed to let MB-SMF triggers the removal of MBS session.

* **Other clarifications**

Make use of the services provided by MB-SMF and modify the messages.

Address the case for legacy AF.

Complete/align the IEs of the messages.

# 2. Text Proposal

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

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

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 22.146: "Multimedia Broadcast/Multicast Service (MBMS); Stage 1".

[3] 3GPP TS 22.246: "Multimedia Broadcast/Multicast Service (MBMS) user services; Stage 1".

[4] 3GPP TS 22.261: "Service requirements for the 5G system".

[5] 3GPP TS 23.501: "System architecture for the 5G System (5GS)".

[6] 3GPP TS 23.502: "Procedures for the 5G System; Stage 2".

[7] 3GPP TS 23.503: "Policy and charging control framework for the 5G System (5GS); Stage 2".

[8] 3GPP TS 23.246: "Multimedia Broadcast/Multicast Service (MBMS); Architecture and functional description".

[9] 3GPP TS 38.300: "NR; Overall description; Stage-2".

[10] 3GPP TS 23.468: "Group Communication System Enablers for LTE (GCSE\_LTE)".

[11] 3GPP TS 26.348: "Northbound Application Programming Interface (API) for Multimedia Broadcast/Multicast Service (MBMS) at the xMB reference point".

[12] 3GPP TS 23.003: "Numbering, Addressing and Identification".

[13] 3GPP TS 26.346: "MBMS: Protocols and Codecs".

[14] 3GPP TR 23.757: "Study on architectural enhancements for 5G multicast-broadcast services".

[15] 3GPP TS 38.413: "NG Application Protocol (NGAP)".

[16] 3GPP TS 23.682: "Architecture enhancements to facilitate communications with packet data networks and applications".

\* \* \* \* Second change \* \* \* \*

## 3.1 Terms

For the purposes of the present document, the terms and definitions defined in TR 21.905 [1] and the following apply:

**5GC Individual MBS traffic delivery**: 5G CN receives a single copy of MBS data packets and delivers separate copies of those MBS data packets to individual UEs via per-UE PDU sessions, hence for each such UE one PDU session is required to be associated with a multicast session.

**5GC shared MBS traffic delivery**: 5G CN receives a single copy of MBS data packets and delivers a single copy of those MBS data packets to a RAN node.

**Associated PDU Session:** A PDU Session associated to a multicast session that is used for 5GC Individual MBS traffic delivery method and for signalling related to a user's participation in a multicast session such as join and leave requests.

**Associated QoS Flow:** A unicast QoS Flow that belongs to the associated PDU Session and is used for 5GC Individual MBS traffic delivery method. The associated QoS Flow is mapped to a multicast QoS Flow in a multicast MBS session.

**Broadcast communication service:** A 5GS communication service in which the same service and the same specific content data are provided simultaneously to all UEs in a geographical area (i.e., all UEs in the broadcast coverage area are authorized to receive the data).

NOTE 1: For the broadcast communication service, the content provider and network may not be aware whether the authorized UEs are actually receiving the data being delivered.

**Broadcast MBS session:** An MBS session to deliver the broadcast communication service. A broadcast MBS session is characterised by the content to send and the geographical area where to distribute it.

**Broadcast service area:** The area within which data of one or multiple Broadcast session(s) are sent.

**MBS QoS Flow**: The finest granularity for QoS forwarding treatment for MBS data. Providing different QoS forwarding treatment requires separate MBS QoS Flows in 5GS supporting MBS.

**MBS Service Announcement:** Mechanism to allow users to be informed about the available MBS services.

**MBS session:** A multicast session or a broadcast session.

**MBS Service Type:** Identifies the 5GS communication service used in 5GS, i.e., multicast communication service, or broadcast communication service.

**Multicast communication service:** A 5GS communication service in which the same service and the same specific content data are provided simultaneously to a dedicated set of UEs (i.e., not all UEs in the multicast coverage are authorized to receive the data).

NOTE 2: For multicast communication service, the content provider and network can be aware whether the authorized UEs are actually receiving the data being delivered.

**Multicast MBS session:** An MBS session to deliver the multicast communication service. A multicast MBS session is characterised by the content to send, by the list of UEs that may receive the service and optionally by a multicast area where to distribute it.

**Multicast service area:** The area within which data of one or multiple Multicast session(s) may be sent.

\* \* \* \* Third change \* \* \* \*

## 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. The MBS service area could be geographical area information or civic address information, and NEF/MBSF translates the location information to Cell ID list or TAI list as MBS service area, see clause 7.1.1.1. 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 the network shall not deliver location specific content anymore to the UEs moved out of the MBS service area. The UE shall be able to obtain service area information of the local multicast service via MBS service announcement or via NAS signalling (UE Session Join Accept/Reject including Cell ID list or TAI list). If the UE Session Join procedure fails due to the UE being outside the multicast service area, the UE does not attempt to join the multicast session again until the UE moves inside the multicast service area. When the UE Session Join succeeds and if the multicast session is deactivated, the UE does not perform monitoring the session activation notification and any other information related to the multicast session identified by an MBS Session ID over the radio if outside the multicast service area.

A location dependent MBS is a local MBS 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 MBS service area. The Area Session ID is used, in combination with MBS Session ID, to uniquely identify the service area specific part of the MBS service within 5GS. The network supports the location-dependent content distribution for the location dependent MBS services, while UEs are only aware of the MBS Session ID (i.e. UEs are not required to be aware of the Area Session IDs). 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 MBS service areas for a location dependent MBS service may be provided by one or several AFs or may be configured. Different ingress points for location dependent points for the MBS session are supported for different MBS service area dependent content of the MBS session; different MB-SMFs and/or MB-UPF may be assigned for different MBS service areas in an MBS session.

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

NOTE 1: In this release, deployments topologies with specific SMF Service Areas are not supported, as a result, location dependent service using multicast communication is not supported when a UE moves outside its SMF service area.

NOTE 2: For location dependent service provided in different MBS service areas within the same SMF service area, it is assumed that one MB-SMF is used for an MBS Session.

NOTE 3: An example of Location-dependent MBS is a nationwide weather forecast service with local weather reports.

NOTE 4: Area Session ID is equivalent to Flow ID as specified in TS 23.246 [8].

\* \* \* \* Fourth change \* \* \* \*

## 6.11 Service Announcement

Service Announcement provides the UE with descriptions specifying the multicast or broadcast services to be delivered as part of MBS Session.

The Service Announcement includes the MBS Session ID(s), which is represented by TMGI or a Source Specific IP Multicast Address, for the service. When the MBS Session ID is Source Specific IP Multicast Address, the Service Announcement may include the PLMN ID of the PLMN in which the service is delivered.

The Service Announcement includes an MBS Service Type, which indicates whether the MBS Session for the service is multicast or broadcast.

NOTE 1: A Source Specific IP Multicast Address as MBS Session ID indicates a multicast session.

For local MBS service, the Service Announcement may include the MBS service area. The MBS service area can be Cell ID list, TAI list, geographical area information or civic address information. Amongst them, Cell ID list and TAI list shall only be used by AFs who reside in trust domain, and when the AFs are aware of such information.

If the MBS Session is multicast, the Service Announcement may include the DNN and S-NSSAI of the PDU Session to indicate which PDU Session is associated with the MBS Session.

NOTE 2: For multicast, AF or MBSF provides Service Announcement only after the MBS information is available to 5GC or the start time need be included, to avoid potential rejection sent by SMF of the MBS session join request.

Editor’s note: Other means to provide MBS session related information to UE, e.g. pre-configuration of default PLMN ID, DNN and S-NSSAI and possible additional information are FFS.

Editor's note: If DNN and S-NSSAI information is not provided in the service announcement or pre-configured, how UE determines the PDU session to join the MBS Session is FFS.

The Service Announcement may be provided to a UE by AF or MBSF, or may be retrieved by the UE from those entities.

Editor's note: Other entities that can send Service Announcement to UE is FFS.

Editor's note: The details of Service Announcement will be defined with coordination with SA4/SA6, including which information is aware by UE.

\* \* \* \* Fifth change \* \* \* \*

### 7.1.1 Information provisioning for MBS Session

#### 7.1.1.1 Initial MBS session information provisioning

This procedure is used by the AF to provide parameters corresponding to the MBS Session towards 5GC and consist of TMGI allocation, and MBS session start procedures, and they apply to both multicast and broadcast communications unless otherwise stated. Follow-up procedures may be triggered per its MBS service type (i.e., multicast or broadcast communication service) to reserve resources towards NG-RAN.

For broadcast communication service, MBS Session start consists of radio resource reservation towards the NG-RAN. For multicast communication, the radio resource reservation is performed when there is UE join.

For both broadcast and multicast communication service, the TMGI allocation may be executed separately from the residual procedure.

For multicast communication service, TMGI allocation procedure is applicable if TMGI is used as MBS Session ID.

**MB-UPF**

**MB-SMF**

**NRF**

**NEF/MBSF**

**AF**

3. MB-SMF discovery

4. Allocate TMGI Request ()

5. Allocate TMGI Response ()

6. Allocate TMGI Response

2. Authorization

9. Authorization

10. MB-SMF discovery

11. Nmbsmf\_MBSSession\_Create Request ()

8. MBS Session Request

12. NF Profile update

13. Session Request

14. Session Response

1. Allocate TMGI Request

For broadcast, see clause 7.3.1

For multicast, if UE can only join after MBS Session is established by AF

15. Nmbsmf\_MBSSession\_Create Response ()

**MBSTF**

16. Session Request

17. Session Response

18. MBS Session Response

19. Service Announcement (see clause 6.11)

7. Service Announcement (see clause 6.11)

Figure 7.1.1.1-1: Initial MBS session parameters provisioning.

Steps 1 to 6 are optional and only applicable if TMGI is used as MBS Session ID and required to be pre-allocated. For the AF that only supports legacy MB2 interface, the details are specified in TS 23.468 [10] and TS 23.682 [X], and the BM-SC and NEF are replaced by MB-SMF and SCEF respectively.

1. AF sends Allocate TMGI Request () message to NEF/MBSF to request allocation of one or more TMGIs to identify the MBS session(s).

NOTE 1: Depending on the configuration, MB-SMF may receive requests from AF directly, or via NEF, or via MBSF, or via NEF and MBSF.

2. NEF checks authorization of AF, as defined in clause 6.1.1.

NOTE 2: NEF is not required if AF is in trusted domain.

3. NEF/MBSF discovers and selects an MB-SMF using NRF or based on local configuration.

4. NEF/MBSF sends an Allocate TMGI Request () message to the MB-SMF.

5. MB-SMF allocates TMGI(s) and returns the TMGI(s) to the NEF/MBSF via Allocate TMGI Response (TMGI(s)).

6. The NEF or MBSF responds to the AF by sending an Allocate TMGI Response (TMGI(s)) message.

7. The AF may perform a Service Announcement towards UEs. See clause 6.11.

Editor's note: How to do service announcements requires SA WG4 /WG6 coordination.

8. AF of content provider may provide description for an MBS session (possibly providing information for a previously allocated TMGI; e.g. MBS service type of either multicast service or broadcast service) to NEF/MBSF by MBS Session Request ([MBS Session ID], service type, MBS information, [TMGI allocation indication]) message. If step 1-4 has not been executed before, the AF may provide a source specific multicast address or it may request that the network allocates an identifier for the MBS session (i.e., TMGI) and its MBS service type. MBS information may further include QoS requirements, UE authorization information (e.g. a GPSI or an External Group Id or a UE ID to identify UEs authorized to join the multicast service), MBS service area (see clause 6.11 for detail) identifying the service scope, start and end time of MBS. In addition, MBS information may also indicate whether the allocation of an ingress transport address is requested.

If geographical area information or civic address information was provided by the AF as MBS service area, NEF/MBSF translates the MBS service area to Cell ID list or TAI list.

9. NEF/MBSF checks authorization of content provider, as defined in clause 6.1.1.

10. NEF/MBSF discovers MB-SMF candidates and selects MB-SMF as ingress control node, possibly based on MBS service area.

If TMGI is included in step 8, NEF/MBSF finds MB-SMF based on TMGI

11. NEF/MBSF sends Nmbsmf\_MBSSession\_Create Request (MBS Session ID, MBS service type, TMGI allocation indication, MBS service area information, ingress transport address request indication) to MB-SMF to reserve ingress resources for a MBS distribution session and provides MBS Session ID or request allocation, and indicate its MBS service type. It also indicates if the allocation of an ingress transport address is requested.

 The MBS service area is provided by NEF/MBSF to the MB-SMF if provided by the AF in step 7.

12. If MB-SMF is selected by NEF/MBSF in step 10 and source specific multicast address is provided in step 11, MB-SMF allocates TMGI and MB-SMF updates NF profile to NRF with the serving MBS Session ID, see clause 7.1.2.

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13. The MB-SMF derives the required QoS parameters locally. MB-SMF selects the MB-UPF and requests it to reserve user plane ingress resources. If multicast transport of the MBS data towards RAN nodes is to be used, the MB-SMF also request the MB-UPF to reserve for the outgoing data a tunnel endpoint and the related identifiers (source IP address, source specific multicast address and GTP Tunnel ID) and to forward data received at the user plane ingress resource using that tunnel endpoint.

 If ingress address is not requested, the MB-SMF configure MB-UPF to handle the multicast data distribution and request the MB-UPF to join the multicast tree towards the content provider. MB-UPF can also join the distribution tree of the content provider in the subsequent session establishment procedure.

14. If requested, MB-UPF selects an ingress address (IP address and port) and a tunnel endpoint for the outgoing data and provides it to MB-SMF.

For broadcast MBS service type, the MB-SMF continues the procedure towards the AMF and NG-RAN as specified in clause 7.3.1 before steps 15-18 are executed.

For multicast MBS service type, depending on configuration the UE can join the MBS Session after steps 15-19 are executed.

15. MB-SMF indicates the possibly allocated ingress address to the NEF/MBSF by using Nmbsmf\_MBSSession\_Create Response ([TMGI], [Allocated ingress address]). MB-SMF may include TMGI if it is allocated in step 12. It also indicates the success or failure of reserving transmission resources.

16. [Optional] If the MBSF decides to use an MBSTF, the MBSF provides the received ingress address in step 16 towards the MBSTF as DL destination, and requests the MBSTF to allocate the user plane ingress resources.

17. [Conditional on step 17] If requested, MBSTF selects an ingress address (IP address and port) and provides it to MBSF.

18. The NEF/MBSF includes the ingress address if allocated and other parameters (e.g. TMGI) to the AF by MBS Session Response ([TMGI], [Allocated ingress address]) message. If MBS Session ID is not provided in step 8, or the MBS Session ID is source specific multicast address, the NEF/MBSF provides the allocated TMGI. If AF requests the allocation of an ingress transport address, the message also includes the allocated ingress address.

19. Same as step 7. The AF may also perform a service announcement at this stage.

For multicast communication, depending on configuration, UE join request can be accepted from this point onward.

#### 7.1.1.2 Initial MBS session information provisioning with PCC deployed

If PCC is deployed, AF/NEF/MBSF know that PCF should be involved.

Compared to the procedure in clause 7.1.1.1, the difference are shown as follows:After step 12 and before step 13:

- Step 12a: The MB-SMF sends SM MBS Policy Association Request (MBS Session ID) to PCF with the MBS Session ID.

- Step 12b: by using Nbsf\_management\_Register Request (MBS Session ID, PCF ID)s

NOTE 1: Step 12b, 15a-15b are not needed for the case if AF can get the ID of PCF selected by MB-SMF.

- Step 12c:

- Step 12d: The PCF responds with SM MBS Policy Association Response (MBS Policy) with policies for the MBS Session ID.

After step 15 and before step 16:

- Step 15a-15b: The NEF/MBSF uses the BSF Discovery service to discover the MB-PCF serving the MBS session with the MBS session ID, by using Nbsf\_management\_Discovery operation.

- Step 15c: .

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- Step 15d: 15c

NOTE 2: For broadcast MBS session, this policy information update may further trigger the MBS Session Update procedure for broadcast defined in clause 7.3.3.

- Step 15e:

#### 7.1.1.3 Removal of MBS session information

This procedure is used by the AF to stop the MBS Session towards 5GC. This procedure may also consist of TMGI de-allocation. The procedures apply to both multicast and broadcast communications unless otherwise stated. This procedure releases the reserved resources in both 5GC and NG-RAN.

**MB-UPF**

**MB-SMF**

**NRF**

**NEF/MBSF**

**AF**

2. Nmbsmf\_MBSSession\_Release Request ()

1. MBS Session Stop Request

6. NF Profile update

4. Session Release Request

5. Session Release Response

3. For broadcast, see clause 7.3.2.

For multicast, see clause 7.2.2.3

7. Nmbsmf\_MBSSession\_Release Response ()

**MBSTF**

8. Session Request

9. Session Response

10. MBS Session Stop Response

12. Deallocate TMGI Request ()

13. Deallocate TMGI Response ()

14. Deallocate TMGI Response

11. Deallocate TMGI Request

Figure 7.1.1.3-1: Removal of MBS Session information.

1. AF of content provider may request stop contents for the MBS session by sending MBS Session Stop Request (MBS Session ID) to NEF.

2. NEF/MBSF requests MB-SMF to release ingress resources for the MBS distribution session, by invoking Nmbsmf\_MBSSession\_Release Request (MBS Session ID) message.

3. For broadcast MBS session, the MB-SMF triggers resource release towards the AMFs as specified in clause 7.3.2. For multicast session, the MB-SMF triggers resource release towards the SMFs as specified in 7.2.2.3.

4. MB-SMF requests the MB-UPF to release user plane ingress resources.

5. MB-UPF responds MB-SMF with Session Release response message.

6. [Conditional] If MB-SMF configured the profile with an MBS session ID when the MBS session was configured, the MB-SMF updates its NF profile at NRF to release the MBS Session ID.

7. MB-SMF responds to the NEF/MBSF with Nmbsmf\_MBSSession\_Release Response () message with the result indication included.

8. [Optional] If the MBSTF is used, the MBSF requests the MBSTF to release the resources.

9. [Conditional on step 17] If requested, MBSTF releases the resources and responds to NEF/MBSF.

10. The NEF/MBSF responds to the AF via MBS Session Stop Response.

11. [Optional] AF requests NEF/MBSF to de-allocate TMGI(s), by sending Deallocate TMGI Request message to NEF/MBSF.

NOTE 1: For the AF that only supports legacy MB2 interface, the details are specified in TS 23.468 [10] and TS 23.682 [X], and the BM-SC and NEF are replaced by MB-SMF and SCEF respectively.

12. NEF/MBSF forwards Deallocate TMGI Request to MB-SMF.

NOTE 2: Depending on the configuration, MB-SMF may receive requests from AF directly, or via NEF, or via MBSF, or via NEF and MBSF.

13. The MB-SMF responds to the NEF/MBSF by sending a Deallocate TMGI Response message.

14. NEF/MBSF forwards Deallocate TMGI Response message to the AF.

#### 7.1.1.4 Removal of MBS session information with PCC deployed

If PCC is deployed, AF/NEF/MBSF know that PCF should be involved. Compared to the procedure in clause 7.1.1.3, the difference are shown as follows:

After step 6 and before step 7:

- Step 6a: The MB-SMF sends SM MBS Policy Association Termination Request (MBS Session ID) to PCF with the MBS Session ID.

- Step 6b: The PCF de-registers at the BSF that it handles the multicast session.

- Step 6c: The PCF replies to MB-SMF with the SM MBS Policy Association Termination Response ().

#### 7.1.1.5 MBS Session information update

This procedure is used by the AF to update the MB service area and/or update QoS of an MBS Session. Updating QoS of an MBS Session may lead to the addition/removal of MBS QoS Flow(s). The procedure applies to both multicast and broadcast communications unless otherwise stated.

**MB-UPF**

**MB-SMF**

**NEF/MBSF**

**AF**

3. Nmbsmf\_MBSSession\_Update Request ()

1. MBS Session Update Request

4. Session Update Request

5. Session Update Response

6. For broadcast, see clause 7.3.

For multicast, see clause 7.2.6

7. Nmbsmf\_MBSSession\_Update Response ()

8. MBS Session Update Response

2. Authorization

Figure 7.1.1.5-1: Update of MBS Session information

1. AF initiates MBS Session Update, e.g. to update MBS service area for broadcast and/or update service requirement, by sending MBS Session Update Request (MBS Session ID, [service requirement], [MBS service area]) message.

2. NEF/MBSF may check authorization of the request.

3. NEF/MBSF forward the request to MB-SMF, via invoking Nmbsmf\_MBSSession\_Update Request (MBS Session ID, [service requirement], [MBS service area]) message.

4-5. The MB-SMF derives the updated QoS parameters locally. MB-SMF may need to update MB-UPF, e.g. if new MBS QoS Flow is to be created, or existing MBS QoS Flow is to be deleted.

6. For broadcast communication, the MB-SMF continues the procedure towards the AMF and NG-RAN as specified in clause 7.3. For multicast communication, the MB-SMF continues the procedure towards the AMF and NG-RAN as specified in clause 7.2.6.

7. MB-SMF responds NEF/MBSF by Nmbsmf\_MBSSession\_Update Response message.

8. NEF/MBSF sends MBS Session Update Response message.

7.1.1.6 MBS session information update with PCC deployed

**MB-UPF**

**MB-SMF**

**PCF**

**NEF/MBSF**

**AF**

3. Npcf\_MBSPolicy\_Association\_Update Request ()

1. MBS Session Update Request

2. Authorization

4. Npcf\_MBSPolicy\_Association\_Update Response ()

6. Npcf\_MBSPolicyControl\_Update Notify ()

7. Session Update Request

8. Session Update Response

5. MBS Session Update Response

9. For broadcast, see clause 7.3.

For multicast, see clause 7.2.6.

Figure 7.1.1.6-1: Update of MBS Session information with PCC deployed.

1. AF of content provider may provide to a NEF/MBSF updated information for an MBS session (identified by MBS session ID) by sending MBS Session update request ([MBS Session ID], MBS information, AF Identifier). MBS information may include service requirements, MBS service area information, and media information. The service requirements adjustment may lead to addition of new MBS QoS Flow(s), removal of existing MBS QoS Flow(s) or update of existing MBS QoS Flow(s).

2. NEF/MBSF may check authorization of the request.

3. NEF/MBSF updates the MBS policy Association to PCF and provides the input received from the AF, by sending Npcf\_MBSPolicy\_Association\_Update Request message (MBS Session ID, service requirement).

4. The PCF responds to NEF/MBSF the result of request with Npcf\_MBSPolicy\_Association\_Update Response message.

5. NEF/MBSF response to AF via MBS Session Update Response message.

6. Based on the input received in step 3, the PCF may provide updated policy rules to the MB-SMF by issuing Npcf\_MBSPolicyControl\_UpdateNotify request message including the updated policy information about the MBS Session.

7-8. The MB-SMF derives the updated QoS parameters based on the updated policy information. MB-SMF may need to update MB-UPF, e.g. if new MBS QoS Flow is to be created, or existing MBS QoS Flow is to be deleted.

9. For broadcast communication, the MB-SMF continues the procedure towards the AMF and NG-RAN as specified in clause 7.3. For multicast communication, the MB-SMF continues the procedure towards the AMF and NG-RAN as specified in clause 7.2.6.

\* \* \* \* End of changes \* \* \* \*