

Source: TSG CN WG3
Title: CRs to Rel-6 on Work Item “MBMS”
Agenda item: 9.8
Document for: APPROVAL

Introduction:

This document contains 4 CRs to Rel-6 on Work Item “MBMS” that have been agreed by TSG CN WG3, and are forwarded to TSG CN Plenary for approval.

WG_tdoc	Spec	CR	R	Cat	Title	Rel	C_Ver
N3-040410	29.061	111	2	B	Gmb Commands and AVPs (II)	Rel-6	6.0.0
N3-040411	29.061	112	2	B	Gmb Message Flows.	Rel-6	6.0.0
N3-040386	29.061	113	1	B	Command to indicate Session Start/Stop	Rel-6	6.0.0
N3-040393	29.061	114	1	B	Gmb Introduction	Rel-6	6.0.0

CHANGE REQUEST

⌘ **29.061 CR 113** ⌘ rev **1** ⌘ Current version: **6.0.0** ⌘

For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Command to indicate Session Start/Stop		
Source:	⌘ TSG_CN WG3		
Work item code:	⌘ MBMS	Date:	⌘ 10/05/2004
Category:	⌘ B	Release:	⌘ Rel-6
	Use <u>one</u> of the following categories: F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) Rel-4 (Release 4) Rel-5 (Release 5) Rel-6 (Release 6)

Reason for change:	⌘ Session Start and Session Stop commands coding were left for furthe study. This contribution is taken into account the Tdoc N3-04385, were those commands were left FFS.
Summary of change:	⌘ The Session Start and Session Stop commands are defined as Re-Authorization-Request/Answer commands with a newly defined set of AVPs to fullfill the requirements.
Consequences if not approved:	⌘ MBMS session Start and Stop procedures cannot be implemented.

Clauses affected:	⌘ 17.6.6 17.6.6 New clauses added.						
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px;">Y</td> <td style="width: 20px;">N</td> </tr> <tr> <td style="text-align: center;">⌘</td> <td style="text-align: center;">X</td> </tr> </table> Other core specifications	Y	N	⌘	X	⌘	
Y	N						
⌘	X						
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px;">⌘</td> <td style="width: 20px;">X</td> </tr> </table> Test specifications	⌘	X	⌘			
⌘	X						
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px;">⌘</td> <td style="width: 20px;">X</td> </tr> </table> O&M Specifications	⌘	X	⌘			
⌘	X						
Other comments:	⌘						

How to create CRs using this form:

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- 1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

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- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

17.6.5 ~~Session-StartStop~~Re-Auth-Request Command

~~Editor's note: FFS. This is part of the service specific functions.~~

The Re-Auth-Request (RAR) command, defined in IETF RFC3588 (DIAMETER BASE) [66], is indicated by the Command-Code set to 258 and the message flags' 'R' bit set.

The relevant AVPs that are of use for the Gmb interface are detailed in the ABNF description below. Other valid AVPs for this command are not used for Gmb purposes and should be ignored by the receiver or processed according to the relevant specifications.

The bold marked AVPs in the message format indicate new optional AVPs for Gmb, or modified existing AVPs.

Message Format:

```

<RAR> ::= < Diameter Header: 258, REQ, PXY >
      < Session-Id >
      { Origin-Host }
      { Origin-Realm }
      { Destination-Realm }
      { Destination-Host }
      { Auth-Application-Id }
      { Re-Auth-Request-Type }
      [ MBMS-StartStop-Indication ]
      [ MBMS-Service-Area ]
      [ 3GPP-Vendor-Specific ]
      [ MBMS-Session-Duration ]
      [ Origin-State-Id ]
      * [ Proxy-Info ]
      * [ Route-Record ]

```

The MBMS-StartStop-Indication AVP will indicate if the command is indicating a MBMS Start procedure or a MBMS Stop procedure.

For the MBMS Start procedure, RAR is sent by the BM-SC to the GGSN(s) that have previously registered for the corresponding MBMS bearer service, when it is ready to send data. This is a request to activate all necessary bearer resources in the network for the transfer of MBMS data and to notify interested UEs of the imminent start of the transmission.

For MBMS Stop procedure, RAR is sent by the BM-SC to the GGSN(s) when it considers the MBMS session to be terminated. The session is typically terminated when there is no more MBMS data expected to be transmitted for a sufficiently long period of time to justify a release of bearer plane resources in the network.

The MBMS service to be started/stopped is identified by the session-id.

17.6.6 ~~Session-StartStop~~Re-Auth-Answer Command

~~Editor's note: FFS. This is part of the service specific functions.~~

The Re-Auth-Answer (RAA) command, defined in IETF RFC3588 (DIAMETER BASE) [66], is indicated by the Command-Code set to 258 and the message flags' 'R' bit clear, is sent in response to the RAR.

The relevant AVPs that are of use for the Gmb interface are detailed in the ABNF description below. Other valid AVPs for this command are not used for Gmb purposes and should be ignored by the receiver or processed according to the relevant specifications.

Message Format:

```

<RAA> ::= < Diameter Header: 258, PXY >

```

```

< Session-Id >
{ Result-Code }
{ Origin-Host }
{ Origin-Realm }
[ MBMS-StartStop-Indication ]
[ Origin-State-Id ]
[ Error-Message ]
[ Error-Reporting-Host ]
* [ Failed-AVP ]
* [ Redirected-Host ]
[ Redirected-Host-Usage ]
[ Redirected-Host-Cache-Time ]
* [ Proxy-Info ]

```

***** NEXT MODIFIED SECTION *****

17.7.5 MBMS-StartStop-Indication AVP

The MBMS-StartStop-Indication AVP (AVP code TBD) is of type Enumerated. The following values are supported:

START _____ 0

The message containing this AVP is indicating a MBMS session start procedure.

STOP _____ 1

The message containing this AVP is indicating a MBMS session stop procedure.

17.7.6 MBMS-Service-Area AVP

The MBMS-Service-Area AVP (AVP code TBD) is of type OctetString, and indicates the area over which the MBMS bearer service has to be distributed.

17.7.5 MBMS-Session-Duration AVP

The MBMS-Session-Duration AVP (AVP code TBD) is of type Unsigned32, and indicates the estimated session duration (MBMS Service data transmission) if available. The time is indicated in seconds.

CHANGE REQUEST

⌘ **29.061 CR 114** ⌘ rev **1** ⌘ Current version: **6.0.0** ⌘

For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Gmb introduction		
Source:	⌘ TSG_CN WG3		
Work item code:	⌘ MBMS	Date:	⌘ 10/05/2004
Category:	⌘ B	Release:	⌘ Rel-6
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)	2	(GSM Phase 2)
	A (corresponds to a correction in an earlier release)	R96	(Release 1996)
	B (addition of feature),	R97	(Release 1997)
	C (functional modification of feature)	R98	(Release 1998)
	D (editorial modification)	R99	(Release 1999)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)

Reason for change:	⌘ This CR is the same as N3-040227, presented at CN3#31bis, that was agreed after revision, and postponed to CN3#32.
	MBMS has been identified to require message exchange between the GGSN and the BM-SC. CN3 has previously agreed to document the required functionality into 29.061.
Summary of change:	⌘ Introduction of new sections, with the first definitions for the Gmb interface.
Consequences if not approved:	⌘ Delay in the introduction of MBMS. Lack of development of stage 2 requirements

Clauses affected:	⌘ New clauses introduced						
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table>	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other core specifications	⌘
Y	N						
<input type="checkbox"/>	<input checked="" type="checkbox"/>						
	<input checked="" type="checkbox"/>	Test specifications					
	<input checked="" type="checkbox"/>	O&M Specifications					
Other comments:	⌘						

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2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] Void.
- [2] 3GPP TS 22.060: "General Packet Radio Service (GPRS); Service Description; Stage 1".
- [3] 3GPP TS 23.060: "General Packet Radio Service (GPRS); Service Description; Stage 2".
- [4] Void.
- [5] Void.
- [6] Void.
- [7] Void.
- [8] Void.
- [9] Void.
- [10] 3GPP TS 27.060: "Packet Domain; Mobile Station (MS) supporting Packet Switched services".
- [11] ITU-T Recommendation E.164: "The international public telecommunication numbering plan".
- [12] Void.
- [13] Void.
- [14] Void.
- [15] IETF RFC 768 (1980): "User Datagram Protocol" (STD 6).
- [16] IETF RFC 791 (1981): "Internet Protocol" (STD 5).
- [17] IETF RFC 792 (1981): "Internet Control Message Protocol" (STD 5).
- [18] IETF RFC 793 (1981): "Transmission Control Protocol" (STD 7).
- [19] IETF RFC 1034 (1987): "Domain names - concepts and facilities" (STD 7).
- [20] Void.
- [21a] IETF RFC 1661 (1994): "The Point-to-Point Protocol (PPP)" (STD 51).
- [21b] IETF RFC 1662 (1994): "PPP in HDLC-like Framing".
- [22] IETF RFC 1700 (1994): "Assigned Numbers" (STD 2).
- [23] 3GPP TS 44.008: "Mobile radio interface layer 3 specification; Core Network protocols; Stage 3".
- [24] 3GPP TS 29.060: "General Packet Radio Service (GPRS); GPRS Tunnelling Protocol (GTP) across the Gn and Gp interface".

- [25] IETF RFC 2794 (2000): "Mobile IP Network Address Identifier Extension for IPv4", P. Calhoun, C. Perkins.
- [26] IETF RFC 2131 (1997): "Dynamic Host Configuration Protocol".
- [27] IETF RFC 1542 (1993): "Clarification and Extensions for the Bootstrap Protocol".
- [28] IETF RFC 2373 (1998): "IP Version 6 Addressing Architecture".
- [29] IETF RFC 2462 (1998): "IPv6 Stateless Address Autoconfiguration".
- [30] IETF RFC 2002 (1996): "IP Mobility Support", C. Perkins.
- [31] IETF RFC 2486 (1999): "The Network Access Identifier", B. Aboba and M. Beadles.
- [32] IETF RFC 1112 (1989): "Host extensions for IP multicasting", S.E. Deering.
- [33] IETF RFC 2236 (1997): "Internet Group Management Protocol, Version 2", W. Fenner.
- [34] IETF RFC 2362 (1998): "Protocol Independent Multicast-Sparse Mode (PIM-SM): Protocol Specification", D. Estrin, D. Farinacci, A. Helmy, D. Thaler, S. Deering, M. Handley, V. Jacobson, C. Liu, P. Sharma, L. Wei
- [35] IETF RFC 1075 (1988): "Distance Vector Multicast Routing Protocol", D. Waitzman, C. Partridge, S.E. Deering.
- [36] IETF RFC 1585 (1994): "MOSPF: Analysis and Experience", J. Moy.
- [37] IETF RFC 2290 (1998): "Mobile-IPv4 Configuration Option for PPP IPCP", J. Solomon, S. Glass.
- [38] IETF RFC 2865 (2000): "Remote Authentication Dial In User Service (RADIUS)", C. Rigney, S. Willens, A. Rubens, W. Simpson.
- [39] IETF RFC 2866 (2000): "RADIUS Accounting", C. Rigney, Livingston.
- [40] 3GPP TS 23.003: "Numbering, addressing and identification".
- [41] IETF RFC 2882 (2000): "Network Access Servers Requirements: Extended RADIUS Practices", D. Mitton.
- [42] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [43] Void.
- [44] IETF RFC 2461 (1998): "Neighbor Discovery for IP Version 6 (IPv6)", T. Narten, E. Nordmark, W. Simpson
- [45] IETF RFC 3118 (2001): "Authentication for DHCP Messages", R. Droms, W. Arbaugh.
- [46] IETF Internet-Draft: "Dynamic Host Configuration Protocol for IPv6 (DHCPv6)", draft-ietf-dhc-dhcpv6-28.txt, work in progress.
- [47] 3GPP TS 24.229: "IP Multimedia Call Control Protocol based on SIP and SDP"
- [48] IETF RFC 2710 (1999): "Multicast Listener Discovery (MLD) for IPv6", S. Deering, W. Fenner, B. Haberman.
- [49] IETF RFC 2460 (1998): "Internet Protocol, Version 6 (IPv6) Specification", S.Deering, R.Hinden.
- [50] IETF RFC 3162 (2001): "RADIUS and IPv6", B. Adoba, G. Zorn, D. Mitton.
- [51] IETF RFC 2548 (1999): "Microsoft Vendor-specific RADIUS Attributes", G.Zorn.
- [52] 3GPP TS 23.228: "IP Multimedia Subsystem (IMS); Stage 2".
- [53] 3GPP TS 29.207: "Policy control over Go interface".
- [54] 3GPP TS 24.008: "Mobile radio interface layer 3 specification; Core Network protocols; Stage 3".

- [55] Void.
- [56] 3GPP TS 29.208: "End to end Quality of Service (QoS) signalling flows".
- [57] Void.
- [58] IETF RFC 1035 (1987): "Domain names - implementation and specification" (STD 13).
- [59] Void.
- [60] IETF RFC 1771 (1995): "A Border Gateway Protocol 4 (BGP-4)".
- [61] IETF RFC 1825 (1995): "Security Architecture for the Internet Protocol".
- [62] IETF RFC 1826 (1995): "IP Authentication Header".
- [63] IETF RFC 1827 (1995): "IP Encapsulating Security Payload (ESP)".
- [64] IETF RFC 2044 (1996): "UTF-8, a transformation format of Unicode and ISO 10646".
- [65] [3GPP TS 23.246: "Multimedia Broadcast/Multicast Service \(MBMS\) Architecture and Functional Description"](#)
- [66] [IETF RFC 3588 "Diameter Base Protocol"](#)
- [67] [draft-ietf-aaa-diameter-nasreq-14.txt: "Diameter Network Access Server Application", work in progress](#)

3 Definitions, abbreviations and symbols

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TS 22.060 [2] and 3GPP TS 23.060 [3] and the following apply:

2G- / 3G-: prefixes 2G- and 3G- refers to functionality that supports only A/Gb mode GPRS or Iu mode, respectively, e.g., 2G-SGSN refers only to the A/Gb mode GPRS functionality of an SGSN. When the prefix is omitted, reference is made independently from the A/Gb mode GPRS or Iu mode functionality.

A/Gb mode: indicates that the text applies only to a system or sub-system which operate in A/Gb mode of operation, i.e. with a functional division that is in accordance with the use of an A or a Gb interface between the radio access network and the core network.

Iu mode: indicates that the text applies only to a system or a sub-system which operates in Iu mode of operation, i.e. with a functional division that is in accordance with the use of an Iu-CS or Iu-PS interface between the radio access network and the core network.

3.2 Abbreviations

Abbreviations used in the present document are listed in 3GPP TS 21.905 [42]. For the purposes of the present document, the following additional abbreviations apply:

APN	Access Point Name
ATM	Asynchronous Transfer Mode
BG	Border Gateway
BM-SC	Broadcast/Multicast Service Centre
CHAP	Challenge Handshake Authentication Protocol
DHCP	Dynamic Host Configuration Protocol

DHCPv6	Dynamic Host Configuration Protocol version 6
DNS	Domain Name System
DVMRP	Distance Vector Multicast Routing Protocol
GGSN	Gateway GPRS Support Node
GTP-U	GPRS Tunnelling Protocol for user plane
ICMP	Internet Control Message Protocol
IETF	Internet Engineering Task Force
IGMP	Internet Group Management Protocol
IMS	IP Multimedia Core Network Subsystem
IP	Internet Protocol
IPCP	IP Control Protocol (PPP NCP for IPv4)
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
IPV6CP	IPv6 Control Protocol (PPP NCP for IPv6)
ISDN	Integrated Services Digital Network
ISP	Internet Service Provider
LAC	L2TP Access Concentrator
LAN	Local Area Network
LNS	L2TP Network Server
MBMS	Multimedia Broadcast/Multicast Service
MIP	Mobile IP
MLD	Multicast Listener Discovery
MOSPF	Multicast Open Shortest Path First
MS	Mobile Station
MT	Mobile Terminal
MTU	Maximum Transfer Unit
NAI	Network Access Identifier
PAP	Password Authentication Protocol
PDF	Policy Decision Function
PDCP	Packet Data Convergence Protocol
PDN	Packet Data Network
PDU	Protocol Data Unit
PEP	Policy Enforcement Point
PIM-SM	Protocol Independent Multicast – Sparse Mode
PPP	Point-to-Point Protocol
PS	Packet Switched
RADIUS	Remote Authentication Dial In User Service
SBLP	Service Based Local Policy
SGSN	Serving GPRS Support Node
SMDS	Switched Multimegabit Data Service
TCP	Transmission Control Protocol
TE	Terminal Equipment
TEID	Tunnel End-point Identifier
UDP	User Datagram Protocol

3.3 Symbols

For the purposes of the present document, the following symbols apply:

Gb	Interface between an SGSN and a BSC.
Gi	Reference point between Packet Domain and an external packet data network.
Gmb	Reference point between GGSN and BM-SC.
Gn	Interface between two GSNs within the same PLMN.
Go	Interface between a GGSN and a PDF.
Gp	Interface between two GSNs in different PLMNs. The Gp interface allows support of Packet Domain network services across areas served by the co-operating PLMNs.
Gs	Interface between an SGSN and MSC.
Iu	Interface between the RNS and the core network. It is also considered as a reference point.
R	The reference point between a non-ISDN compatible TE and MT. Typically this reference point supports a standard serial interface.

Um	The interface between the MS and the fixed network part in A/Gb mode. The Um interface is the A/Gb mode network interface for providing packet data services over the radio to the MS. The MT part of the MS is used to access the GSM services through this interface.
Uu	Interface between the mobile station (MS) and the fixed network part in Iu mode. The Uu interface is the Iu mode network interface for providing packet data services over the radio to the MS. The MT part of the MS is used to access the UMTS services through this interface.

*****NEW SECTION*****

17 Usage of Diameter on Gmb interface

Signalling between GGSN and BM-SC is exchanged at Gmb reference point. BM-SC functions for different MBMS bearer services may be provided by different physical network elements. To allow this distribution of BM-SC functions, the Gmb protocol must support the use of proxies to correctly route the different signalling interactions in a manner which is transparent to the GGSN.

The GGSN uses the Gmb interface

- to request authorisation/deactivation of a user for an MBMS service,
- to register/de-register the GGSN for receiving the MBMS service.
- to receive indication of session start and session stop messages, which shall cause the GGSN, SGSN and RAN to set up/tear down the appropriate resources for the service. For further details, see 3GPP TS 23.246 [65].

The support of Gmb within the GGSN is optional, and needed for MBMS.

17.1 MBMS user authorisation

Upon reception of an IGMP (IPv4) or MLD (IPv6) Join message for an IP multicast address allocated to MBMS services, the GGSN shall request authorisation of the user for this MBMS bearer service (identified by the PDP context over which the IGMP join is received).

The GGSN shall support pre-configuration of a BM-SC or Gmb proxy server for authorisation purposes to which the request shall be sent. The GGSN may support a list of pre-configured BM-SC servers based on the MBMS bearer service requested, for authorisation purposes.

Upon receipt of an MBMS UE Context Establishment Request for a user who has not already been authorised for the MBMS bearer service, the GGSN shall request authorisation of the user for this service.

17.2 MBMS service registration / de-registration

The MBMS service registration of the GGSN at the BMSC shall be performed after authorisation of the first user on a particular GGSN, for a particular MBMS Bearer service. The MBMS service de-registration of the GGSN shall be performed when the last user leaves a particular GGSN, for a particular MBMS bearer service.

The MBMS de-registration procedure shall be initiated by BM-SC when the specific MBMS service is terminated.

The GGSN shall support pre-configuration of a BM-SC or Gmb proxy server for registration/de-registration purposes. The GGSN may support a list of pre-configured BM-SC servers based on the MBMS bearer service requested for bearer registration purposes.

17.3 MBMS session start / stop

The MBMS session start shall be used by the BM-SC to trigger the bearer resource establishment and announce the arrival of data for a MBMS bearer service (along with the attributes of the data to be delivered e.g. QoS or MBMS service area) to every GGSN that has registered for the MBMS bearer service.

The MBMS session stop shall be used by the BM-SC to indicate the end of the data stream for a MBMS bearer service to every GGSN that has registered for the MBMS bearer service.

17.4 MBMS user deactivation

The MBMS user deactivation is a procedure that removes the MBMS UE context from the GGSN for a particular MBMS bearer service (also called “leaving procedure”). This procedure can be initiated by the GGSN or the BM-SC over the Gmb interface.

When the last user leaves a particular GGSN, for a particular MBMS service, a de-registration process shall be initiated.

CHANGE REQUEST

⌘ **29.061 CR 111** ⌘ rev **2** ⌘ Current version: **6.0.0** ⌘

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Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Gmb Commands and AVPs (II)		
Source:	⌘ TSG_CN WG3		
Work item code:	⌘ MBMS	Date:	⌘ 10/05/2004
Category:	⌘ B	Release:	⌘ Rel-6
	Use <u>one</u> of the following categories: F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) Rel-4 (Release 4) Rel-5 (Release 5) Rel-6 (Release 6)

Reason for change:	⌘ Introduction of the Gmb messages and AVPs		
Summary of change:	⌘ Introduction of new sections, containing some Gmb messages and AVPs. This CR was presented in N3-040157 in CN3#31bis. There, it was postponed to CN3#32, and was to be discussed in between by email. The New changes based in comments recived to N3-040157are: - Removed automatic numbering from clauses - Indication that the MBMS Service Area is part of the StartStop command - Introduction of Abort-Session-Request ASR, and ASA, as requested in CN3#31bis The rest remain the same.		
Consequences if not approved:	⌘ Delay in the introduction of MBMS. Lack of development of stage 2 requirements		

Clauses affected:	⌘ New clauses introduced										
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"> </td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;"> </td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;"> </td> <td style="text-align: center;">X</td> </tr> </table>	Y	N		X		X		X	⌘ Other core specifications ⌘ Test specifications ⌘ O&M Specifications	⌘
Y	N										
	X										
	X										
	X										
Other comments:	⌘										

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- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

17.6 Gmb Messages

This clause defines the Gmb interface Diameter messages.

The relevant AVPs that are of use for the Gmb interface are detailed in this clause. Other Diameter NASREQ AVPs, even if their AVP flag rules is marked with “M”, are not required for being compliant with the current specification.

17.6.1 AAR Command

The AAR command, defined in Diameter NASREQ[67], is indicated by the Command-Code field set to 265 and the ‘R’ bit set in the Command Flags field. It is sent by the GGSN to the BM-SC to request user authorization (authorize the activating UE to receive Data) or to register the GGSN for a particular MBMS bearer service.

The relevant AVPs that are of use for the Gmb interface are detailed in the ABNF description below. Other valid AVPs for this command are not used for Gmb purposes and should be ignored by the receiver or processed according to the relevant specifications.

The bold marked AVPs in the message format indicate new optional -AVPs for Gmb, or modified existing AVPs.

Message Format:

```
<AA-Request> ::= < Diameter Header: 265, REQ, PXY >
    < Session-Id >
    { Auth-Application-Id }
    { Origin-Host }
    { Origin-Realm }
    { Destination-Realm }
    { Auth-Request-Type }
    [ Destination-Host ]
    [ Called-Station-Id ]
    [ Calling-Station-Id ]
    [ Framed-IP-Address ]
    [ Framed-IPv6-Prefix ]
    [ Framed-Interface-Id ]
    * [ Proxy-Info ]
    * [ Route-Record ]
    [ 3GPP-Vendor-Specific ]
```

The GGSN shall allocate a new Session-Id for each time an AAR command is sent.

A request for user authorisation for an MBMS bearer service is indicated by the presence of the MSISDN within the Calling-Station-Id AVP and the IMSI within the 3GPP-Vendor-Specific AVP. Otherwise the request is for the GGSN to be authorised (i.e. registered) to receive the MBMS bearer service.

The Framed-IPv6-Prefix AVP contains the IPv6 prefix of the multicast address identifying the MBMS bearer service.

The Framed-Interface-Id AVP contains the IPv6 interface identifier of the multicast address identifying the MBMS bearer service.

The Framed-IP-Address AVP contains the IPv4 multicast address identifying the MBMS bearer service.

The Called-Station-Id AVP contains the Access Point Name (APN) on which the MBMS bearer service authorisation request was received.

17.6.2 AAA Command

The AAA command, defined in Diameter NASREQ [67], is indicated by the Command-Code field set to 265 and the 'R' bit cleared in the Command Flags field. It is sent by the BM-SC to the GGSN in response to the AAR command.

The relevant AVPs that are of use for the Gmb interface are detailed in the ABNF description below. Other valid AVPs for this command are not used for Gmb purposes and should be ignored by the receiver or processed according to the relevant specifications.

Message Format:

```
<AA-Answer> ::= < Diameter Header: 265, PXY >
                < Session-Id >
                { Auth-Application-Id }
                { Result-Code }
                { Origin-Host }
                { Origin-Realm }
                [ Error-Message ]
                [ Error-Reporting-Host ]
                * [ Proxy-Info ]
                [ 3GPP-Vendor-Specific ]
                [ TMGI ]
                [ Required-MBMS-Bearer-Capabilities ]
```

17.6.3 STR Command

The STR command, defined in IETF RFC3588 (DIAMETER BASE) [66], is indicated by the Command-Code field set to 275 and the 'R' bit set in the Command Flags field. It is sent by the GGSN to the BM-SC to terminate a DIAMETER session.

A DIAMETER session for an MBMS service is terminated when the last MBMS UE context for a particular MBMS bearer service is deleted. This informs the BM-SC that the GGSN would like to be deleted from the distribution tree of a particular MBMS bearer service (De-registration procedure).

A DIAMETER session for an individual UE's MBMS service authorisation is terminated when the UE has requested to the GGSN to leave the MBMS bearer service.

This command can also be originated by the BM-SC when the specific MBMS bearer service is terminated and all MBMS Bearer Context must be released.

The relevant AVPs that are of use for the Gmb interface are detailed in the ABNF description below. Other valid AVPs for this command are not used for Gmb purposes and should be ignored by the receiver or processed according to the relevant specifications.

The bold marked AVPs in the message format indicates: new optional specific AVPs for Gmb, or modified existing

Message Format:

```
<ST-Request> ::= < Diameter Header: 275, REQ, PXY >
                < Session-Id >
                { Origin-Host }
                { Origin-Realm }
                { Destination-Realm }
                { Auth-Application-Id }
                { Termination-Cause }
                [ Destination-Host ]
                * [ Class ]
                [ Origin-State-Id ]
                * [ Proxy-Info ]
                * [ Route-Record ]
```

17.6.4 STA Command

The STA command, defined in IETF RFC3588 (DIAMETER BASE) [66], is indicated by the Command-Code field set to 275 and the 'R' bit cleared in the Command Flags field, is sent in response to an STR command (De-registration procedure).

The relevant AVPs that are of use for the Gmb interface are detailed in the ABNF description below. Other valid AVPs for this command are not used for Gmb purposes and should be ignored by the receiver or processed according to the relevant specifications.

The bold marked AVPs in the message format indicates: new optional specific AVPs for Gmb, or modified existing

Message Format:

```
<ST-Answer> ::= < Diameter Header: 275, PXY >
                < Session-Id >
                { Result-Code }
                { Origin-Host }
                { Origin-Realm }
                * [ Class ]
                [ Error-Message ]
                [ Error-Reporting-Host ]
                * [ Failed-AVP ]
                [ Origin-State-Id ]
                * [ Redirect-Host ]
                [ Redirect-Host-Usase ]
                [ Redirect-Max-Cache-Time ]
                * [ Proxy-Info ]
```

Editor's note: The same way that in 17.6.1, some text describing how this AVP's are use for Gmb purposes is needed. This is FFS if those clarifications are needed.

17.6.5 Session-StartStop-R Command

Editor's note: FFS. This is part of the service specific functions.

17.6.6 Session-StartStop-A Command

Editor's note: FFS. This is part of the service specific functions. It will contain, among others, an AVP indicating the **MBMS-Service-Area**.

17.6.7 Abort-Session-Request Command

The Abort-Session-Request (ASR) command, defined in IETF RFC3588 (DIAMETER BASE) [66], is indicated by the Command-Code set to 274 and the message flags' R' bit set, is sent by the BM-SC to the GGSN to request that the session identified by the Session-Id be stopped.

The relevant AVPs that are of use for the Gmb interface are detailed in the ABNF description below. Other valid AVPs for this command are not used for Gmb purposes and should be ignored by the receiver or processed according to the relevant specifications.

Message Format

```
<ASR> ::= < Diameter Header: 274, REQ, PXY >
                < Session-Id >
                { Origin-Host }
                { Origin-Realm }
                { Destination-Realm }
```

```

_____ { Destination-Host }
_____ { Auth-Application-Id }
_____ [ Origin-State-Id ]
_____ * [ Proxy-Info ]
_____ * [ Route-Record ]

```

17.6.8 Abort-Session-Answer Command

The Abort-Session-Answer (ASA) command, defined in IETF RFC3588 (DIAMETER BASE) [66], is indicated by the Command-Code set to 274 and the message flags 'R' bit clear, is sent in response to the ASR.

The relevant AVPs that are of use for the Gmb interface are detailed in the ABNF description below. Other valid AVPs for this command are not used for Gmb purposes and should be ignored by the receiver or processed according to the relevant specifications.

Message Format

```

_____ <ASA> ::= < Diameter Header: 274, PXY >
_____ < Session-Id >
_____ { Result-Code }
_____ { Origin-Host }
_____ { Origin-Realm }
_____ [ Origin-State-Id ]
_____ [ Error-Message ]
_____ [ Error-Reporting-Host ]
_____ * [ Failed-AVP ]
_____ * [ Redirected-Host ]
_____ [ Redirected-Host-Usage ]
_____ [ Redirect-Max-Cache-Time ]
_____ * [ Proxy-Info ]

```

17.7 Gmb specific AVPs

17.7.1 3GPP-Vendor-Specific AVP

The 3GPP Vendor-Specific AVP (AVP code TBD) is of type grouped, and contains information on the Quality of Service (QoS) required for a particular MBMS bearer service.

Editor's note: The definition of this AVP is FFS. 3GPP-GPRS-Negotiated-QoS-Profile is the sub-attribute used to contain the QoS information.

17.7.2 TMGI AVP

The TMGI AVP (AVP code TBD) is of type OctectString, and contains the Temporary Mobile Group Identity allocated to a particular MBMS bearer service

Editor's note: The definition of this AVP is FFS

17.7.3 Required-MBMS-Bearer-Capabilities AVP

The Required-MBMS-Bearer-Capabilities AVP (AVP code TBD) is of type grouped, and contains the minimum bearer capabilities the UE needs to support

Editor's note: The details of this AVP are FFS. According to TS 23.246 all QoS attributes described in 23.107 are applicable to MBMS bearer services. Probably this can be assimilated to one of the existing Gi Radius attributes

17.7.4 MBMS-Service-Area AVP

The MBMS-Service-Area AVP (AVP code TBD) is of type OctetString, and indicates the area over which the MBMS bearer service has to be distributed.

Editor's note: The detailed definition of this AVP is FFS

CHANGE REQUEST

⌘ **29.061 CR 112** ⌘ rev **2** ⌘ Current version: **6.0.0** ⌘

For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Gmb Message Flows.		
Source:	⌘ TSG_CN WG3		
Work item code:	⌘ MBMS	Date:	⌘ 10/05/2004
Category:	⌘ B	Release:	⌘ Rel-6
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)	2	(GSM Phase 2)
	A (corresponds to a correction in an earlier release)	R96	(Release 1996)
	B (addition of feature),	R97	(Release 1997)
	C (functional modification of feature)	R98	(Release 1998)
	D (editorial modification)	R99	(Release 1999)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)

Reason for change:	⌘ Introduction of the first messages flows		
Summary of change:	⌘ Introduction to the messages flows		
Consequences if not approved:	⌘ Incomplete Message flows		

Clauses affected:	⌘ New clause introduced 17.5										
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table>	Y	N	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Other core specifications	⌘
Y	N										
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<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>										
		Test specifications									
		O&M Specifications									
Other comments:	⌘										

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at <http://www.3gpp.org/specs/CR.htm>. Below is a brief summary:

- 1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
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- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

17.5 Message flows

17.5.1 Service activation

The MBMS bearer service activation procedure registers the user in the network to enable the reception of data from a specific MBMS bearer service

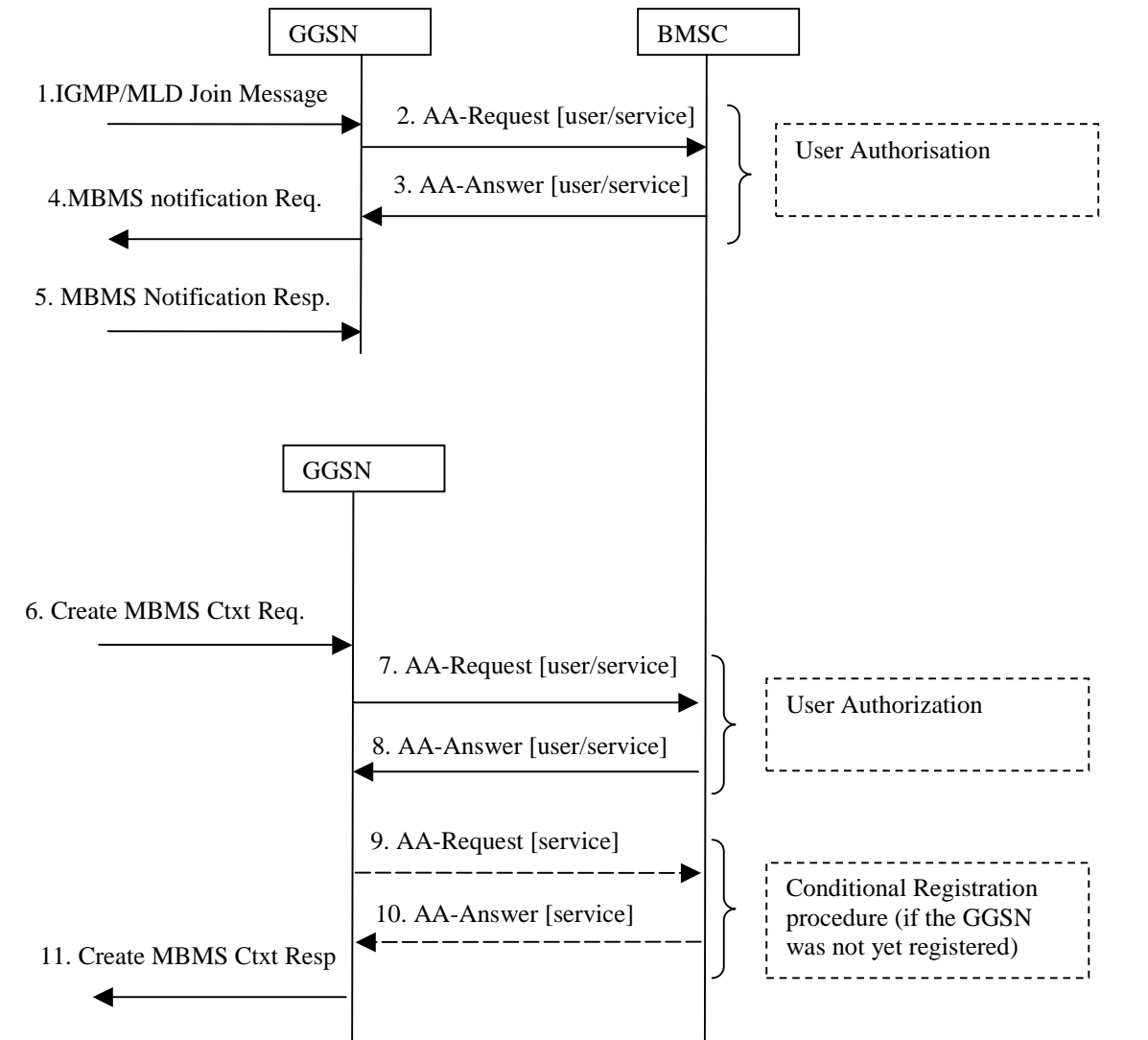


Figure 26; Activation of an MBMS multicast service

1. The GGSN receives an IGMP (IPv4) or MLD (IPv6) Join message from a UE, over the default PDP context to signal its interest in receiving a particular multicast MBMS bearer service identified by an IP multicast address.
2. The GGSN sends an AAR seeking authorization for the activating UE to receive data from a particular service.
3. The authorization decision is provided in the AAA together with the APN to be used for creation of the MBMS UE context. If the AAA indicates that the UE is not authorized to receive the MBMS data the process terminates with no additional message exchange.

4. The GGSN receives the IGMP/MLD Join request and sends an MBMS Notification Request (IP multicast address, APN, Linked NSAPI) to the SGSN. Linked NSAPI is set equal to the NSAPI of the PDP context over which the Join request was received. The IP multicast address is the one requested by the UE in the Join request. The APN may be different from the APN to which the default PDP context has been activated. In any case, the APN may resolve to a GGSN that is different from the GGSN receiving the IGMP/MLD Join request. The GGSN starts a MBMS Activation Timer as GGSN may receive no response, e.g. in case SGSN or UE does not support MBMS.
5. The SGSN sends a MBMS Notification Response (Cause) to the GGSN that sent the MBMS Notification Request, where Cause shall indicate successful or unsuccessful MBMS context activation for the reason of SGSN or UE . Upon reception of the response message with Cause indicating unsuccessful operation or time-out of the MBMS Activation Timer in the GGSN, the GGSN may fallback to IP multicast access as defined in 3GPP TS 29.061 [4].
6. The SGSN creates an MBMS UE context and sends a Create MBMS Context Requests (IP multicast address, APN) to the GGSN. That GGSN may be different from the GGSN receiving the IGMP/MLD Join request.
7. The GGSN sends an AAR seeking authorization for the activating UE.
8. The authorization decision is provided in the AAA
9. If the GGSN does not have the MBMS Bearer Context information for this MBMS bearer service, i.e. the GGSN was not yet registered, the GGSN sends a AAR to the BM-SC. See subclause 17.5.4 "Registration Procedure".
If no TMGI has been allocated for this MBMS bearer service, the BM-SC will allocate a new TMGI. This TMGI will be passed to GGSN via the AAA message.
10. The BM-SC responds with a AAA containing the MBMS Bearer Context information for this MBMS bearer service and adds the identifier of the GGSN to the "list of downstream nodes" parameter in its MBMS Bearer Context. See subclause 17.5.4 "Registration Procedure".
11. The GGSN creates an MBMS UE context and sends a Create MBMS Context Response to the SGSN

17.5.2 Session start procedure

The BM-SC initiates the MBMS session start procedure when it is ready to send data. This informs the GGSN of the imminent start of the transmission and MBMS session attributes are provided to the GGSNs that have previously registered for the corresponding MBMS bearer service. The bearer plane is allocated.

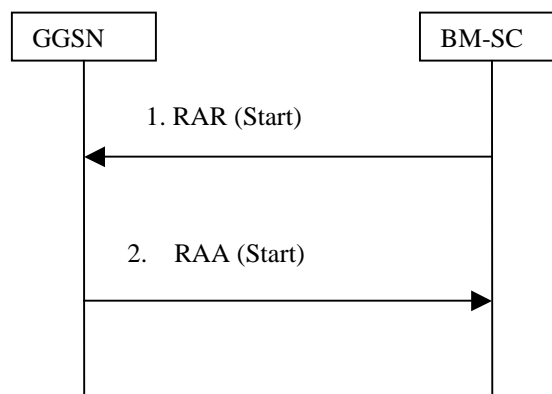


Figure 27: MBMS Session Start procedure

1. The BM-SC sends a MBMS SSR (Start) message to indicate the impending start of the transmission and to provide the session attributes (QoS, MBMS service Area, estimated session duration...) to the GGSNs listed in the "list of downstream nodes" parameter of the corresponding MBMS Bearer Context. The BM-SC sets the state attribute of its MBMS Bearer Context to 'Active'.
2. The GGSN stores the session attributes in the MBMS Bearer Context, sets the state attribute of its MBMS Bearer Context to 'Active' and sends a MBMS SSA (Start) message to the BM-SC.

17.5.3 Session stop procedure

The BM-SC initiates the MBMS session stop procedure when it considers the MBMS session terminated. Typically this will happen when there is no more MBMS data expected to be transmitted for a sufficiently long period of time to justify the release of bearer plane resources in the network.

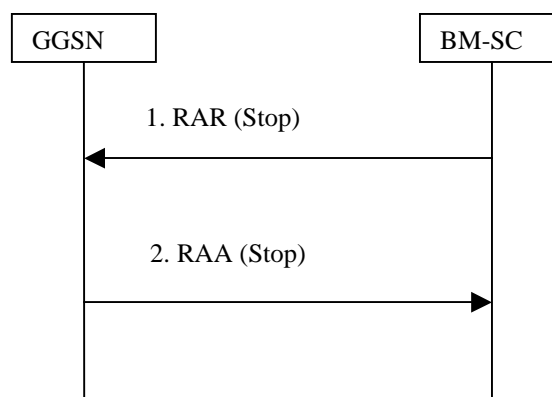


Figure 28: MBMS Session Stop procedure

1. The BM-SC sends a MBMS SSR (Stop) message to all GGSNs listed in the "list of downstream nodes" parameter of the affected MBMS Bearer Context to indicate that the MBMS session is terminated and the bearer plane resources can be released.
2. The GGSN sets the state attribute of its MBMS Bearer Context to 'Standby' and sends a MBMS SSA (Stop) message to the BM-SC.

17.5.4 Registration procedure

The registration procedure occurs when the GGSN indicates the BM-SC that it would like to receive session attributes and data for a particular MBMS bearer service, in order to be distributed further downstream. A corresponding MBMS Bearer Context is established as a result between the GGSN and the BM-SC.

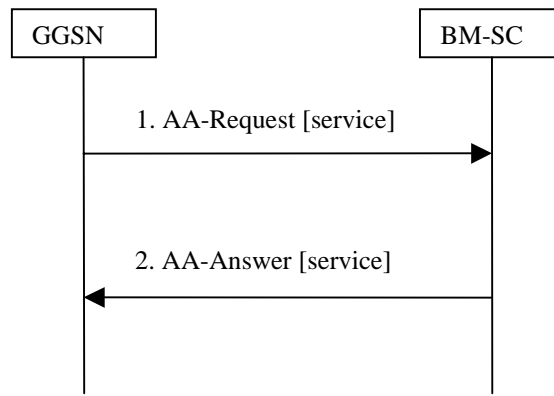


Figure 29: MBMS Registration procedure

1. When the GGSN has no MBMS Bearer Context for an MBMS bearer service and the GGSN receives an MBMS Registration from an SGSN for this MBMS bearer service, or when the first MBMS UE Context is created in the GGSN for an MBMS bearer service for which the GGSN has no MBMS Bearer Context, the GGSN sends a AAR message (containing the IP multicast address and the APN) to the BM-SC.
2. Upon reception of an AAR from a GGSN, the BM-SC adds the identifier of the GGSN to the "list of downstream nodes" parameter in its MBMS Bearer Context and responds with an AAA message (containing TMGI, and Required Bearer Capabilities). If the MBMS Bearer Context is in the 'Active' state, the BM-SC initiates the Session Start procedure with the GGSN, as described in clause 17.5.2 "Session Start Procedure".

17.5.5 De-registration procedure (GGSN initiated)

The MBMS de-registration is the procedure by which the GGSN informs the BM-SC that it does not need to receive signalling, session attributes and data for a particular MBMS bearer service anymore and therefore would like to be removed from the corresponding distribution tree.

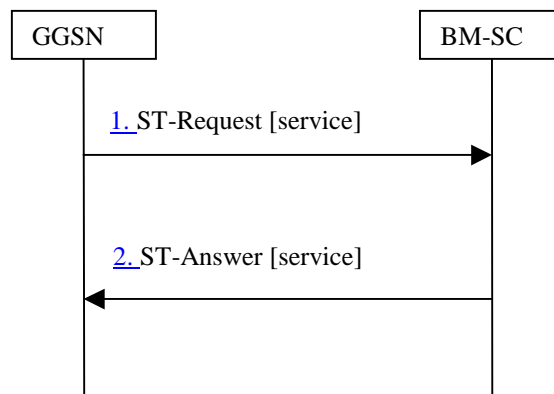


Figure 30: MBMS De-Registration procedure

1. When the "list of downstream nodes" of a particular MBMS Bearer Context in the GGSN becomes empty and the GGSN has no MBMS UE Contexts linked to that MBMS Bearer Context, the GGSN sends a STR message to the BM-SC. If a bearer plane had been established over Gi for this MBMS bearer service, the bearer plane is released.
2. The BM-SC removes the identifier of the GGSN from the "list of downstream nodes" parameter of the affected MBMS Bearer Context and confirms the operation by sending a STA message to the GGSN.

17.5.6 De-registration procedure (BM-SC initiated)

This MBMS de-registration procedure is initiated by BM-SC when the specific MBMS bearer service is terminated. This procedure tears down the distribution tree for the delivery of session attributes and MBMS data. This procedure results in releasing of all MBMS Bearer Contexts.

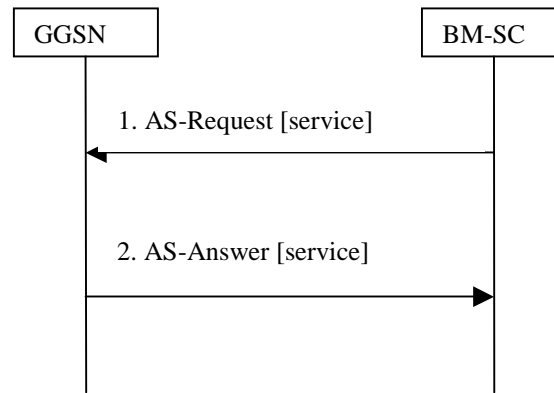


Figure 31: MBMS De-Registration procedure BM-SC initiated

1. The BM-SC sends a ASR message to all GGSNs contained in the "list of downstream nodes" parameter of the corresponding MBMS Bearer Context to indicate that a specific MBMS bearer service is terminated.
2. The GGSN returns a ASA message to the BM-SC. The BM-SC releases all MBMS UE Contexts and removes the identifier of the GGSN from the "list of downstream nodes" parameter of the corresponding MBMS Bearer context.

17.5.7 Service deactivation

The multicast service deactivation is a signalling procedure that will terminate the user registration to a particular MBMS multicast service. The multicast service deactivation can be initiated by the GGSN, when indicated so by the UE, or by the BM-SC, for service specific reasons.

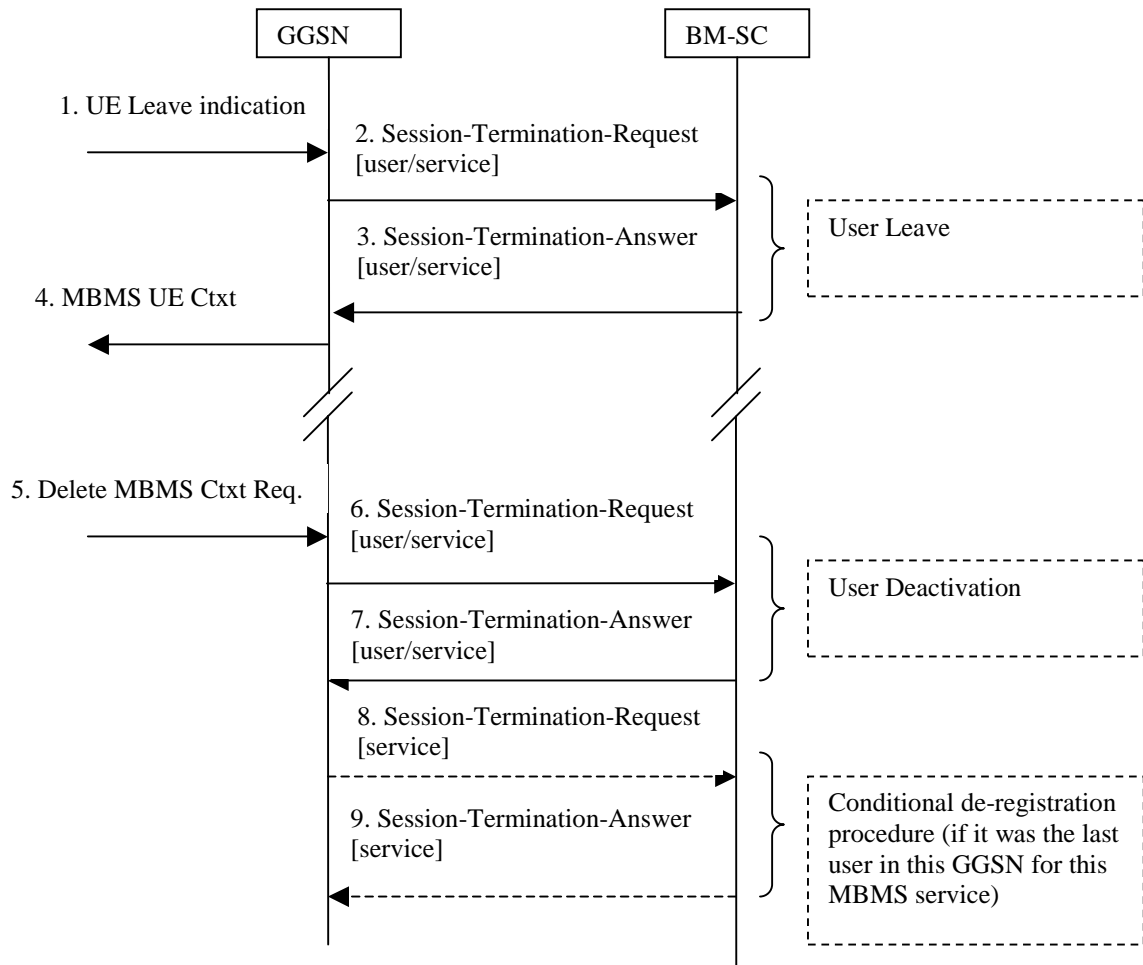


Figure 32: MBMS Service deactivation procedure

1. The UE sends an IGMP (IPv4) or MLD (IPv6) Leave message over the default PDP context to leave a particular multicast service identified by an IP multicast address.
2. The GGSN sends a STR to the BM-SC, indicating that the UE is requesting to leave the multicast service identified by the IP multicast address.
3. Upon reception of the STR, the BM-SC verifies that the IP multicast address corresponds to a valid MBMS bearer service and sends a STA to the GGSN that originated the Leave Indication. The APN shall be the same that was provided during service activation (see " Service Activation" procedure).
4. Upon reception of the STA the GGSN sends an MBMS UE Context Deactivation Request to the SGSN. The IP multicast address, APN and IMSI together identify the MBMS UE Context to be deleted by the SGSN. The APN is the one received in step 3.
5. The GGSN receives a Delete MBMS Context Request (NSAPI). This GGSN may be different from the GGSN that receives IGMP Leave request in step 1.
6. The GGSN deletes the MBMS UE Context and sends a STR to the BM-SC to confirm the successful deactivation of the MBMS UE Context.
7. The BM-SC, then, deletes the MBMS UE Context and sends a confirmation to the GGSN in a STA message.

8. If the GGSN does not have any more users interested in this MBMS bearer service and the "list of downstream nodes" in the corresponding MBSM Bearer Context is empty, the GGSN initiates a De-Registration procedure as specified in 17.5.5.
9. The BM-SC confirms the operation by sending a STA message to the GGSN as specified in 17.5.5.