

Source: TSG SA WG2
Title: CRs on 23.246 (MBMS Stage 2)
Agenda Item: 7.2.3

The following Change Requests (CRs) have been approved by TSG SA WG2 and are requested to be approved by TSG SA plenary #23.
Note: the source of all these CRs is now S2, even if the name of the originating company(ies) is still reflected on the cover page of all the attached CRs.

S2 doc #	Title	Spec	CR #	cat	Version in	REL	WI	S2 meeting	Clauses affected
S2-041037	Paging Coordination	23.246	012r4	C	6.1.0	6	MBMS	S2 #38	A new section 8.15 is added.
S2-040064	Clarification of MBMS Multicast Service Activation	23.246	030r2	F	6.1.0	6	MBMS	S2 #37	6.1, 8.2
S2-040061	Create MBMS Bearer Context in GGSN	23.246	031r2	F	6.1.0	6	MBMS	S2 #37	8.4
S2-040060	TMGI distribution mechanism for Broadcast mode	23.246	036r1	F	6.1.0	6	MBMS	S2 #37	8.14
S2-040979	Buffering of MBMS data at the RNC	23.246	038r2	C	6.1.0	6	MBMS	S2 #38	6.3
S2-040592	Distribution of BM-SC functionality	23.246	039r1	C	6.1.0	6	MBMS	S2 #38	4.3.1
S2-040593	MBMS Application Adjunct Server	23.246	040	C	6.1.0	6	MBMS	S2 #38	7
S2-040978	MBMS TS scope	23.246	041r2	F	6.1.0	6	MBMS	S2 #38	1, 2, 4.4.1.2
S2-041036	SGSN filtering of RAs to support RA-based optimization	23.246	042r3	C	6.1.0	6	MBMS	S2 #38	8.3
S2-040568	Complete the MBMS Service Request Procedure	23.246	043	F	6.1.0	6	MBMS	S2 #38	8.16
S2-040586	Correction on De-Registration Procedure	23.246	044r1	F	6.1.0	6	MBMS	S2 #38	8.6.1
S2-040578	TMGI Definition and Objective	23.246	049	C	6.1.0	6	MBMS	S2 #38	6.4
S2-040981	NSAPI in MBMS Multicast Service Activation	23.246	050r1	F	6.1.0	6	MBMS	S2 #38	6.1, 8.2, 8.7

CR-Form-v7

CHANGE REQUEST

⌘ **23.246 CR 012** ⌘ rev **4** ⌘ Current version: **6.1.0** ⌘

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:	⌘ Paging Coordination		
Source:	⌘ SA2 (Vodafone UK)		
Work item code:	⌘ MBMS	Date:	⌘ 11/02/2003
Category:	⌘ C	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: ⌘ The stage 1 in 22.146 contains the following requirement:

“While receiving one or more multicast services it shall be possible for the user to be informed about incoming voice calls or the availability of other MBMS services.”

Currently, the stage 2 does not describe how this is achieved. Within UTRAN, some of the MBMS mobiles are RRC connected and some are not RRC connected.

For the mobiles that are RRC connected, the RNC can provide paging coordination for incoming CS calls because the Core Network has previously supplied it with the IMSI of each mobile that is PMM connected.

For the mobiles that are not RRC connected, it is unclear whether or not they can monitor their paging channel. CLARIFICATION from RAN 2 is needed on this. If the mobile can receive paging while receiving the MBMS stream, then there are minimal stage 2 impacts. Conversely, if the mobile needs to be sent “in band” notifications, the IMSIs within the MBMS group will need to be sent to the UTRAN.

Currently the stage 1 does not seem to specifically state that it is necessary to be able to notify mobiles which are currently transferring PS domain data or are in a CS domain call that an MBMS session is about to start.

However, it is believed that RAN have some concepts for handling this: these

could be documented in the stage 2 to avoid repeated discussions. The concept is believed to be that, when a mobile enters RRC connected mode, it informs the UTRAN of the MBMS groups which it belongs to.

A similar technique could be used for the GERAN CS domains' RR connections. Within GSM-GPRS, this task may be easier to perform in the SGSN than in the BSC.

It is proposed that the Radio interface signalling for these techniques are added within Release 6, but that some of the network signalling needed for SRNS relocation is left for later releases.

Summary of change: ⌘

Text on notification in case of parallel services is added.

Consequences if not approved: ⌘

- a) Stage 1 requirements not met.
- b) If we don't specify how to notify RRC connected mobiles of MBMS sessions in release 6, then this may be difficult to add in later releases.

Clauses affected: ⌘

A new section 8.15 is added.

Other specs Affected:

Y	N
X	
	X
	X

- Other core specifications
- Test specifications
- O&M Specifications

⌘ GERAN/UTRAN stage 3's

Other comments: ⌘

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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.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://ftp.3gpp.org/specs/>. For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
- 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.

8.15 Notification in case of parallel services

8.15.1 Notification of incoming CS domain call during an ongoing MBMS session

For the RRC connected mobiles in UTRAN, the RNS will have received the IMSI from the core network and hence is able to perform paging coordination. The UEs in RRC idle state in UTRAN need to perform paging coordination while receiving the MBMS session's user data.

8.15.2 Notification of additional MBMS session during an ongoing MBMS session

For the RRC connected mobiles in UTRAN, the SGSN has sent the list of MBMS bearer services that the user has activated to the UTRAN. The RNS needs to notify an RRC connected UE.

For the UEs in RRC idle state, the UTRAN performs MBMS notification for the UE.

8.15.3 Notification of Mobile Terminating PS data during an ongoing MBMS session

For the RRC connected mobiles in UTRAN, the SGSN request the establishment of a RAB which will be used to deliver the MT user data.

For the UEs in RRC idle state, the UTRAN performs paging notification for the UE.

8.15.4 Notification of MBMS session during an ongoing CS or PS domain "connection"

When the UE establishes the UTRAN RRC connection for a CS service, the UE shall send a flag indicating that it has activated at least one MBMS bearer service.. The RNC requests the SGSN to send the list of MBMS bearer services that the user has activated to enable the RNC to notify the UE when MBMS session starts.

When a UE moves to PMM-connected state, the SGSN sends the list of MBMS bearer services that the user has activated to the RNC. The RNC notifies the UE when an MBMS session of the user's activated MBMS bearer services starts.

When the UE establishes a GERAN RR connection for a CS service, the UE shall send a flag indicating that it has activated at least one MBMS bearer service. The BSC request the SGSN to send the list of MBMS bearer services that the user has activated to enable the RNC to notify the UE when MBMS session starts.

CHANGE REQUEST

23.246 CR 030 # rev 2 # Current version: 6.1.0

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:	# Clarification of MBMS Multicast Service Activation		
Source:	# SA2 (Huawei)		
Work item code:	# MBMS	Date:	# 14/01/2004
Category:	# F	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:	# In the current MBMS multicast service activation procedure, it is unclear that the TI is the one that was chosen by the SGSN and included in the Request MBMS Context Activation message that it sent to the UE at the time of activation. The above information should be added to TS 23.246 for easy understanding.
Summary of change:	# Clarification about the TI is included in the MBMS multicast activation procedure. Also, the TI is added to the MBMS UE Context.
Consequences if not approved:	# The MBMS multicast service activation procedure will remain unclear.

Clauses affected:	# 6.1, 8.2						
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> </table> Other core specifications	Y	N	#	X	#	
Y	N						
#	X						
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="text-align: center;">#</td> <td style="text-align: center;">X</td> </tr> </table> Test specifications	#	X	#			
#	X						
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="text-align: center;">#</td> <td style="text-align: center;">X</td> </tr> </table> O&M Specifications	#	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.

*******First Change*******

6.1 MBMS UE Context

The MBMS UE Context contains UE-specific information related to a particular MBMS bearer service that the UE has joined. An MBMS UE Context is created in the UE, SGSN and GGSN when the UE joins an MBMS bearer service. In the SGSN, an MBMS UE Context is also created as a result of an inter-SGSN routing area update after the transfer of the MBMS UE Context from the old SGSN. It is FFS whether MBMS UE Contexts are created in the BM-SC.

In Iu mode, all MBMS UE Contexts of a UE are provided via MBMS UE Linking mechanism to the BSC/SRNC at least when the first PS RAB is established for the UE, or when the UE performs MBMS Multicast Service Activation. MBMS UE Contexts are provided to the BSC/SRNC regardless whether MBMS Sessions are ongoing or not (i.e. before, between and after Sessions). In addition, all MBMS UE Contexts of a UE are provided via MBMS UE Linking mechanism when a UE, which has an MBMS context active, moves to PMM-Connected state via the MBMS Service Request procedure for the purpose of MBMS.

The existence of the MBMS UE context for Gb mode in the BSC is for further study.

In the UE and SGSN, the MBMS UE Context is stored as part of the MM Context for the UE. The MBMS UE Context is stored in the GGSN. There is one MBMS UE Context per MBMS bearer service that the UE has joined.

In the BSC/RNC, the MBMS UE Contexts are stored as part of the UE Context of the BSC/RNC.

The content of the MBMS UE Context is described in Table 1.

Table 1: MBMS UE Context

Parameter	Description	UE	SGSN	GGSN	RNC	BSC	BM-SC
IP multicast address	IP multicast address identifying an MBMS bearer that the UE has joined.	X	X	X	X	Iu - X Gb - FFS	FFS
APN	Access Point Name on which this IP multicast address is defined.	X	X	X	X	Iu - X Gb - FFS	
TMGI	Temporary Mobile Group Identity allocated to the MBMS bearer.	X					
Linked NSAPI	NSAPI of the PDP context used by the UE to carry IGMP/MLD signalling.	X	X				
IMSI	IMSI identifying the user.	(1)	(1)	X	(2)	FFS	
TI	Transaction Identifier	X	X				
FFS	FFS						

(1) In the UE and SGSN, the IMSI is available within the MM Context which contains the MBMS UE Context

(2) In the RNC, the IMSI is available within the UE Context which contains the MBMS UE Context.

*******Second Change*******

8.2 MBMS Multicast Service Activation

The MBMS multicast service activation procedure registers the user in the network to enable the reception of data from a specific multicast MBMS bearer service. The activation is a signalling procedure between the UE and the network. The procedure establishes MBMS UE contexts in UE, SGSN and GGSN and BSC/RNC for each activated multicast MBMS bearer service comparable to regular PDP contexts.

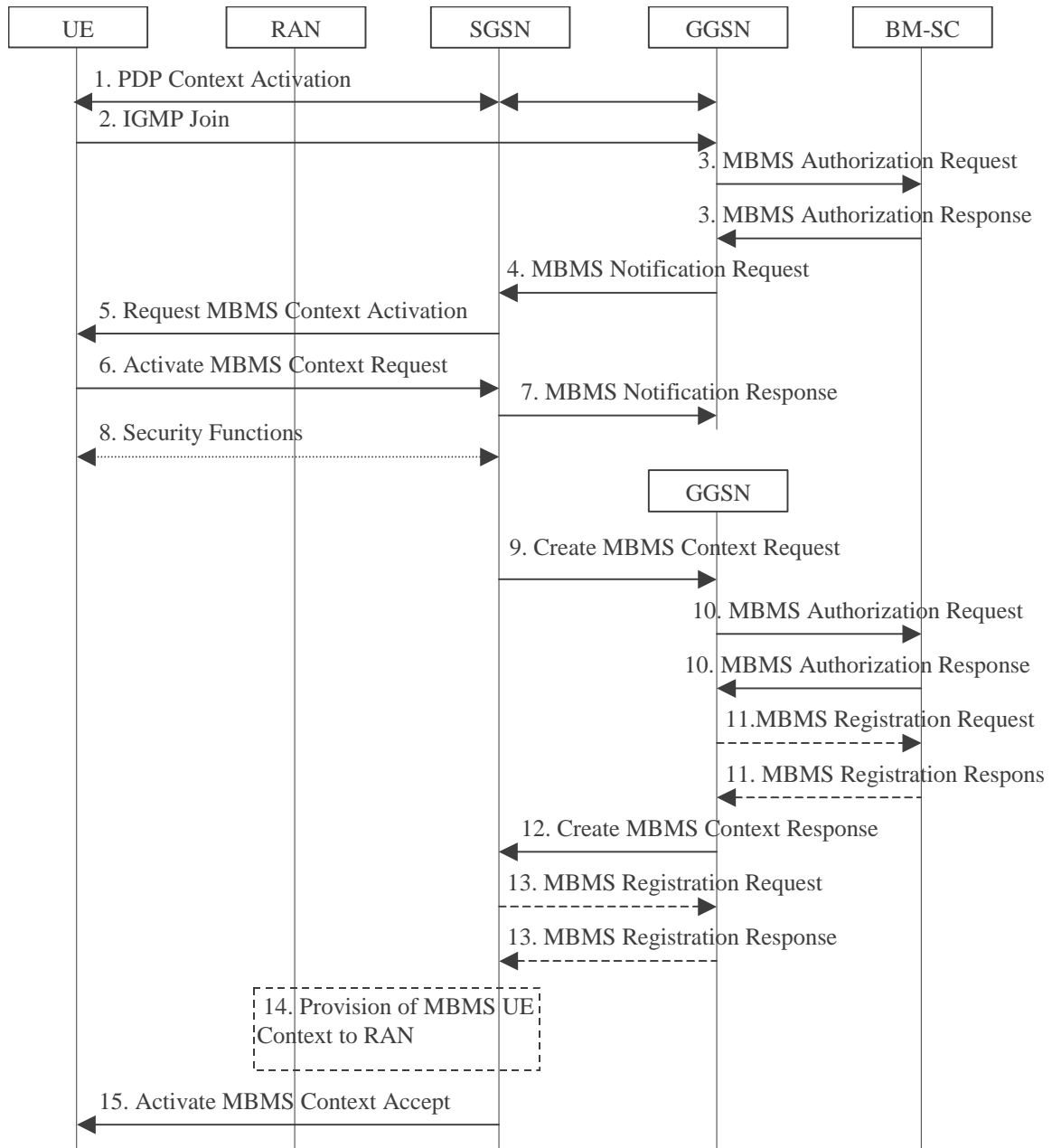


Figure 7: The activation of an MBMS multicast service

1. The UE activates a default, typically best-effort PDP context if not already established. This can be a PDP context used for basic IP services like WAP or Internet access, or it might be the signalling PDP context used for IMS access.
2. The UE sends an IGMP (IPv4) or MLD (IPv6) Join message over the default PDP context to signal its interest in receiving a particular multicast MBMS bearer service identified by an IP multicast address.
3. The GGSN sends an MBMS Authorization Request seeking authorization for the activating UE to receive data. The authorization decision is provided in the MBMS Authorization Response together with the APN to be used for creation of the MBMS UE context. If the MBMS Authorization Response 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 Request MBMS Context Activation (IP multicast address, APN, Linked NSAPI, [TI](#)) to the UE to request it to activate an MBMS context. Linked NSAPI allows the UE to associate the MBMS Context with the PDP context over which it sent the IGMP/MLD Join message in step 2. [TI was chosen by the SGSN and contains a value not used by any other activated PDP context and MBMS UE context for this UE.](#)
6. The UE creates an MBMS UE context and sends an Activate MBMS Context Request (IP multicast address, APN, MBMS bearer capabilities) to the SGSN. The IP multicast address identifies the MBMS multicast service, which the UE wants to join/activate. An APN may indicate a specific GGSN. The MBMS bearer capabilities indicate the maximum QoS the UE can handle.
7. 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 (Cause is FFS). 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].
8. Security Functions may be performed, e.g. to authenticate the UE.
9. It is FFS whether the SGSN performs a subscription check for the requested MBMS bearer service identified by the IP multicast address and APN or whether another network entity performs this check. The SGSN creates an MBMS UE context and sends a Create MBMS Context Requests (IP multicast address, APN) to the GGSN.
10. The GGSN sends an MBMS Authorization Request seeking authorization for the activating UE. The authorization decision is provided in the MBMS Authorization Response.
11. If the GGSN does not have the MBMS Bearer Context information for this MBMS bearer service, the GGSN sends a MBMS Registration Request to the BM-SC. See subclause "MBMS 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 and SGSN via the MBMS Registration Response message and further to UE via Activate MBMS Context Accept message.

The BM-SC responds with a MBMS Registration Response 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 "MBMS Registration Procedure".
12. The GGSN creates an MBMS UE context and sends a Create MBMS Context Response to the SGSN.
13. If the SGSN does not have the MBMS Bearer Context information for this MBMS bearer service, the SGSN sends a MBMS Registration Request to the GGSN. See subclause "MBMS Registration Procedure".

The GGSN responds with a MBMS Registration Response containing the MBMS Bearer Context information for this MBMS bearer service and adds the identifier of the SGSN to the "list of downstream nodes" parameter in its MBMS Bearer Context. See subclause "MBMS Registration Procedure".
14. The SGSN provides RAN with the MBMS UE Context(s) if at least one PS RAB is established for the UE.
15. The SGSN sends an Activate MBMS Context Accept (MBMS bearer capabilities) to the UE. The MBMS bearer capabilities indicate the maximum QoS that is used by this MBMS bearer service and the UE may take it into account when further MBMS bearer services are activated. If the SGSN determines that the UE's MBMS bearer capabilities are lower than the Required MBMS Bearer Capabilities the SGSN rejects the request for activation of an MBMS context indicating an appropriate cause and starts the deactivation of the already established MBMS UE contexts.

CR-Form-v7

CHANGE REQUEST

23.246 CR 031 # rev 2 # Current version: 6.1.0

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:	# Create MBMS Bearer Context in GGSN		
Source:	# SA2 (Huawei)		
Work item code:	# MBMS	Date:	# 14/01/2004
Category:	# F	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)
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	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:	# TS 23.246 does not specify the handling of the MBMS bearer context in the GGSN during registration. This should be done before the GGSN sends the MBMS registration request to the BM-SC.
Summary of change:	# Implicit creation of MBMS bearer context in the GGSN before the GGSN sends the MBMS registration request to the BM-SC in step 3 of subclause 8.4.
Consequences if not approved:	# The MBMS registration procedure for the GGSN is incomplete.

Clauses affected:	# 8.4				
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> Other core specifications #	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Y	N				
<input type="checkbox"/>	<input checked="" type="checkbox"/>				
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table> Test specifications #	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<input type="checkbox"/>	<input checked="" type="checkbox"/>				
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table> O&M Specifications #	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<input type="checkbox"/>	<input checked="" type="checkbox"/>				
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.

8.4 MBMS Registration Procedure

The MBMS Registration is the procedure by which a downstream node informs an upstream node that it would like to receive session attributes and data for a particular MBMS bearer service in order to distribute it further downstream. This procedure builds up a distribution tree for the delivery of MBMS session attributes and data from the BM-SC to the UEs interested in the service. This procedure results in the set-up of a corresponding MBMS Bearer Context in the nodes along the distribution tree, but it does not result in the establishment of bearer plane which will be established by the Session Start procedure.

The MBMS Registration procedure is initiated:

- When the first MBMS UE Context for a particular MBMS bearer service is created in the SGSN or GGSN (see subclause "MBMS UE Context") and the corresponding MBMS Bearer Context is not already established in the node;
- When an MBMS Registration Request for a particular MBMS bearer service is received from a downstream node but the corresponding MBMS Bearer Context is not established in the node; or
- When a DRNC detects that it hosts UEs interested in the MBMS bearer service.

NOTE: The terms 'downstream' and 'upstream' refer to the topological position of one node with respect to another and relative to the direction of the MBMS data flow, i.e. from BM-SC to UE.

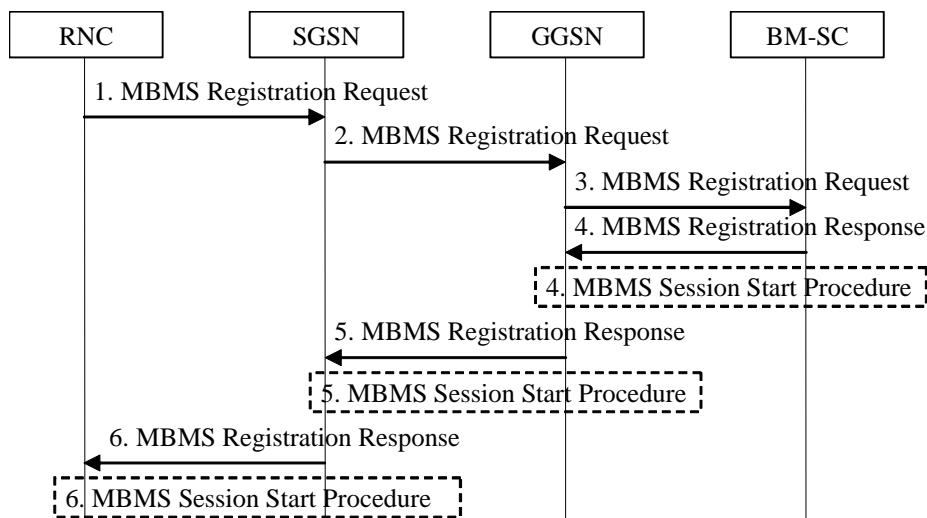


Figure 9: MBMS Registration procedure

1. When the DRNC detects that it hosts UEs interested in the MBMS bearer service, the DRNC sends a MBMS Registration Request message to its parent SGSN if not already done. How the RNC determines its parent SGSN is a matter of implementation.
2. If the SGSN has no MBMS Bearer Context for an MBMS bearer service and the SGSN receives an MBMS Registration Request from an RNC for this MBMS bearer service, or if the first MBMS UE Context is created in the SGSN for an MBMS bearer service for which the SGSN has no corresponding MBMS Bearer Context, the SGSN creates an MBMS Bearer Context (in "Standby" state) and sends an MBMS Registration request (IP multicast address, APN) message to the GGSN. How the SGSN selects a GGSN is a matter of implementation; it may for instance be based on prior signalling related to a particular UE or via APN resolution.
3. If 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 [creates an MBMS Bearer Context \(in "Standby" state\) and](#) sends a Registration Request (IP multicast address, APN) message to the BM-SC. The exact nature of the signalling between GGSN and BM-SC is however FFS in general.
4. Upon reception of an MBMS Registration Request 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 a MBMS Registration

Response (TMGI, Required Bearer Capabilities) message. The exact nature of the signalling between GGSN and BM-SC is however FFS in general. 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 "MBMS Session Start Procedure".

5. If the GGSN receives a Registration Request from the SGSN in step 2, the GGSN:
 - adds the identifier of the SGSN to the "list of downstream nodes" parameter in its MBMS Bearer Context,
 - responds with an MBMS Registration Response (TMGI, Required Bearer Capabilities) message, and
 - if the MBMS Bearer Context is in the 'Active' state, initiates the Session Start procedure with the SGSN, as described in clause "MBMS Session Start Procedure".
6. If the SGSN received MBMS Registration Request from the DRNC in step 1, the SGSN:
 - adds the identifier of the RNC to the "list of downstream nodes" parameter in its MBMS Bearer Context,
 - responds with an MBMS Registration Response message, and
 - if the MBMS Bearer Context is in the 'Active' state, initiates the Session Start procedure with the DRNC, as described clause "MBMS Session Start Procedure".

CHANGE REQUEST

⌘ **23.246 CR 036** ⌘ rev **1** ⌘ Current version: **6.1.0** ⌘

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:	⌘ TMGI distribution mechanism for Broadcast mode		
Source:	⌘ SA2 (Nortel Networks)		
Work item code:	⌘ MBMS	Date:	⌘ 05/01/2004
Category:	⌘ F	Release:	⌘ Rel-6
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
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	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:	⌘ The distribution mechanism of the TMGI for Broadcast mode is not complete: <ul style="list-style-type: none"> - Distribution of TMGI to the UE: it is currently specified in 6.4 that "For Broadcast Service the TMGI can be obtained via service announcement see "Service Announcement"." - Distribution of the TMGI to the Network down to the RAN: the TMGI has also to be distributed in the Network down to the RAN for use in the radio notification. There is currently nothing in the TS to describe how this TMGI is distributed in the Network for Broadcast mode. <p>The only procedure that could be used seems the MBMS Broadcast Session Start procedure. This CR proposes first to add description of the TMGI down to the RAN in this MBMS Broadcast Session Start procedure (section 8.14).</p>
Summary of change:	⌘ Clarify how TMGI is distributed in the Network down to the RAN for Broadcast mode.
Consequences if not approved:	⌘ Lack of description for Broadcast mode.

Clauses affected:	⌘ 8.14						
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: ☹ .

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.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://ftp.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
- 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.

8.12 MBMS Broadcast Service Activation

MBMS Broadcast service activation is the procedure by which a UE locally activates a broadcast MBMS bearer service:

- The MBMS broadcast service activation procedure does not register the user in the network. There is no MBMS bearer service specific signaling exchanged between the UE and the Network.
- The broadcast service activation procedure does not establish MBMS UE contexts in UE, SGSN and GGSN.

8.13 MBMS Broadcast service de-activation

The MBMS Broadcast service de-activation by the UE is local to the UE, i.e. without interaction with the Network.

8.14 MBMS Broadcast Session Start Procedure

The BM-SC initiates the MBMS Session Start procedure 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. It is FFS whether it is also used to notify interested UEs of the start of the transmission.

Through this procedure, MBMS session attributes such as [TMGI](#), QoS, MBMS service Area (tracking/non-tracking area are FFS) are provided to all the GGSN(s), SGSN(s) and BSCs/RNCs. In addition the procedure allocates the bearer plane to all GGSNs and all SGSNs and to BSCs/RNCs that respond to the MBMS session start accordingly.

The overall MBMS Broadcast Session Start procedure is presented in the following figure:

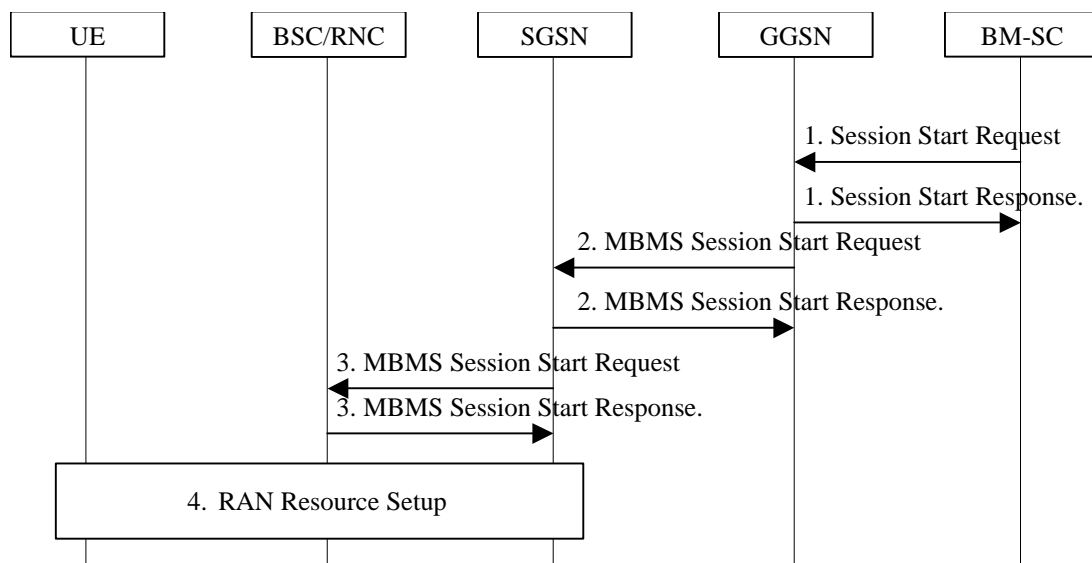


Figure 16 Session Start procedure for Broadcast MBMS Bearer Service

- 1) The BM-SC sends a Session Start Request message the impending start of the transmission and to provide the MBMS session attributes ([TMGI](#), QoS, MBMS service Area...) to a GGSN of the PLMN. The BM-SC sets the state attribute of its MBMS Bearer Context to 'Active'. The GGSN creates a MBMS Bearer Context, stores the session attributes, sets the state attribute of this MBMS Bearer Context to 'Active' and sends a Session Start Response message to the BM-SC.
- 2) The GGSN sends an MBMS Session Start Request message to all its SGSNs. The SGSN creates a MBMS Bearer Context, stores the session attributes, sets the state attribute of this MBMS Bearer Context to 'Active' and responds with an MBMS Session Start Response message providing the TEID for bearer plane that the GGSN shall use for forwarding the MBMS data.
- 3) The SGSN sends an MBMS Session Start Request message including the session attributes to each BSC/RNC that is connected to this SGSN. The BSC/RNC responds with an MBMS Session Start Response message to the

SGSN. If the BSC/RNC serves the MBMS service Area, it creates a MBMS Bearer Context, stores the session attributes in this MBMS Service Context, sets the state attribute of its MBMS Service Context to 'Active' and responds with an MBMS Session Start Response message, and the RNC includes the TEID in the MBMS Session Start Response message for the Iu bearer plane that the SGSN shall use for forwarding the MBMS data. An RNC receiving multiple MBMS Session Start Request messages from different SGSNs includes Iu bearer plane parameters only into one MBMS Session Start Response message to establish only one Iu bearer plane to one SGSN.

4) The BSC/RNC establishes the necessary radio resources for the transfer of MBMS data to the interested UEs.

Note: The upstream node normally provides the MBMS Session Start Request message once per MBMS session to a downstream node. Due to "Intra Domain Connection of RAN Nodes to Multiple Core Network Nodes" however, an RNC may receive the MBMS Session Start Request message from several SGSNs.

CHANGE REQUEST

23.246 CR 038 # rev 2 # Current version: 6.1.0

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:	# Buffering of MBMS data at the RNC		
Source:	# SA2 (Nortel Networks)		
Work item code:	# MBMS	Date:	# 6/02/2004
Category:	# C	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:	# As discussed in SA2#38 buffering of data at the RNC for MBMS background bearers is actually harmful when application layer forward error correction is used. This is because it can result in duplicate packets being received by the UE. Instead, if packets are simply discarded, then further forwards error correction packets will be received by the UE which will be useful in the decoding process.
Summary of change:	# Requirement for shaping/buffering of traffic in the RNC for MBMS background bearers is relaxed. Packet dropping may be used instead.
Consequences if not approved:	# Sub-optimal performance of MBMS over background bearers.

Clauses affected:	# 6.3				
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> </table> Other core specifications	Y	N	#	X
Y	N				
#	X				
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="text-align: center;">#</td> <td style="text-align: center;">X</td> </tr> </table> Test specifications	#	X		
#	X				
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="text-align: center;">#</td> <td style="text-align: center;">X</td> </tr> </table> O&M Specifications	#	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.

***** Start of Changes *****

6.3 Quality-of-Service

It shall be possible for the network to control quality-of-service parameters for sessions of multicast and broadcast MBMS bearer services. All QoS attributes described in [3] are applicable to MBMS bearer services. Compared to point-to-point bearer services the following limitations exist:

- For **traffic class**, only the background and streaming classes shall be supported.
- For **SDU error ratio**, only higher values are supported, i.e. the values describing higher numbers of lost or corrupted SDUs (actual values are FFS).

MBMS bearer services of background class are best suited for the transport of MBMS user services such as messaging or downloading. ~~As for point-to-point bearer services, the network should, as far as possible, avoid dropping packets transported by a background class bearer service. Instead, Buffering, and shaping schemes should and packet dropping may~~ be applied to the traffic flow to adapt to the available resources and changing network conditions. The total transfer time is not critical for background class bearer services since the content must normally have been received in totality and stored in the UE before the user can access it.

MBMS bearer services of streaming class are best suited for the transport of MBMS user services such as streaming. As for point-to-point bearer services, the network should minimise the packet transfer delay of streaming class bearer services as far as possible. Packet dropping should be the preferred traffic conditioning action applied to the traffic flow to adapt to the available resources.

[The principle difference between background and streaming classes for MBMS is the support of a guaranteed bit-rate in the streaming case.](#)

MBMS user services that would normally use MBMS bearer services of background class may however need to use a streaming class MBMS bearer service. ~~This will allow to transfer each MBMS data unit at almost the same point in time in all cells of the MBMS service area, as otherwise UEs moving between cells while an MBMS session is ongoing may experience high packet loss due to possible time offsets of the data transmission between cells. This will reduce packet loss due to congestion, since a minimum bit-rate is guaranteed. The amount of packet loss depends on this time offset, the cell change time and the bitrate in particular.~~ Otherwise the MBMS user service will have to provide sufficient redundancy within the data to be able to cope with the high packet loss.

As the MBMS bearer service transfers data to many UEs in parallel and because of the lack of feedback channel on radio level low SDU error ratios are difficult to achieve. When the resulting packet error ratio is not suitable for the MBMS user service or when prevention of data loss is required, an MBMS user service may perform retransmission of MBMS data over point-to-point PDP bearer services ~~on request from the receiver.~~

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

CHANGE REQUEST

23.246 CR 039 # rev 1 # Current version: 6.1.0

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:	# Distribution of BM-SC functionality		
Source:	# SA2 (Nortel Networks)		
Work item code:	# MBMS	Date:	# 6/02/2004
Category:	# C	Release:	# Rel-6
	<i>Use one of the following categories:</i> 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 .		<i>Use one of the following releases:</i> 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:	# As per Section 4.1 of the TS, BM-SC functions for different services may be provided by separate physical servers. This should also apply the the different types of BM-SC interaction (bearer service specific and user-based). It has been agreed that rather than require the GGSN to interact with multiple servers, proxies could be used to direct the Gmb interactions to the correct devices (for example if Gmb is DIAMETER these would be DIAMETER proxies). This is a Stage 2 requirement on the Stage 3 protocol design (i.e. that the protocol supports the use of proxy routing).
Summary of change:	# Requirement for Gmb protocol to support routing by proxy devices added.
Consequences if not approved:	# Stage 3 design may not accommodate requirement for physical distribution of BM-SC functions according to service or interaction type.

Clauses affected:	# 4.3.1								
Other specs affected:	<table style="display: inline-table; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 2px;">Y</td> <td style="border: 1px solid black; padding: 2px;">N</td> </tr> <tr> <td style="border: 1px solid black; width: 20px; height: 15px;"></td> <td style="border: 1px solid black; width: 20px; height: 15px;"></td> </tr> <tr> <td style="border: 1px solid black; width: 20px; height: 15px;"></td> <td style="border: 1px solid black; width: 20px; height: 15px;"></td> </tr> <tr> <td style="border: 1px solid black; width: 20px; height: 15px;"></td> <td style="border: 1px solid black; width: 20px; height: 15px;"></td> </tr> </table> Other core specifications # Test specifications # O&M Specifications #	Y	N						
Y	N								
Other comments:	#								

How to create CRs using this form:

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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.

***** Start of Changes *****

4.3.1 Gmb

Signalling between GGSN and BM-SC is exchanged at Gmb reference point. This represents the network side boundary of the MBMS Bearer Service from a control plane perspective. This includes user specific Gmb signalling and MBMS bearer service specific signalling.

MBMS bearer service specific Gmb signalling:

- The GGSN establishes the MBMS bearer context and registers at BM-SC.
- The GGSN or the BM-SC releases the MBMS bearer context and de-register the GGSN from the BM-SC.
- The BM-SC indicates session start and stop to the GGSN including session attributes like QoS or MBMS service area.

User specific Gmb signalling:

- The BM-SC authorises the user specific MBMS multicast service activation (join) at the GGSN.
- The GGSN reports to the BM-SC the successful user specific MBMS multicast activation (join) to allow the BM-SC to synchronise the BM-SC UE MBMS context and charging with the MBMS UE contexts in SGSN and GGSN.
- The GGSN reports to the BM-SC when a user specific MBMS multicast service is released or deactivated (e.g. when the radio contact is lost) to synchronise BM-SC UE MBMS contexts and charging with the MBMS UE contexts in SGSN and GGSN.

The BM-SC initiates the deactivation of a user specific MBMS bearer service when the MBMS user service is terminated.

[BM-SC functions for different MBMS bearer services may be provided by different physical network elements. Further, MBMS bearer service specific and user specific signalling for the same MBMS bearer service may also 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.](#)

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

CHANGE REQUEST

23.246 CR 040 # rev **-** # Current version: **6.1.0**

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:	# MBMS Application Adjunct Server		
Source:	# SA2 (Nortel Networks, Bamboo MediaCasting Ltd.)		
Work item code:	# MBMS	Date:	# 5/02/2004
Category:	# C	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:	# Section 7 in TS 23.246 has been allocated for discussion of different issues relating to MBMS user services. The current text relates to possible entities used for providing MBMS user services – entities which are out of scope of TS 23.246. Further the scope and purpose of section 7 is unclear and is conducive to MBMS user service architectural work within the MBMS bearer TS. However, the current description makes considerable assumptions about the most appropriate solution to this problem. There is a danger that other solutions may be ignored during the standardisation of this function by SA4.
Summary of change:	# Scope of section 7 is defined. Description is generalised to describe the problem to be solved and the constraints on the solution arising from SA2's architecture.
Consequences if not approved:	# Unnecessary constraints on solution space in SA4. Possibly incorrect assumptions made elsewhere about nature of 'repair service'.

Clauses affected:	# 7								
Other specs affected:	<table style="display: inline-table; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 2px;">Y</td> <td style="border: 1px solid black; padding: 2px;">N</td> </tr> <tr> <td style="border: 1px solid black; width: 20px; height: 20px;"></td> <td style="border: 1px solid black; width: 20px; height: 20px;"></td> </tr> <tr> <td style="border: 1px solid black; width: 20px; height: 20px;"></td> <td style="border: 1px solid black; width: 20px; height: 20px;"></td> </tr> <tr> <td style="border: 1px solid black; width: 20px; height: 20px;"></td> <td style="border: 1px solid black; width: 20px; height: 20px;"></td> </tr> </table> Other core specifications # Test specifications # O&M Specifications #	Y	N						
Y	N								
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.

***** Start of changes *****

7 Architectural Aspects of MBMS User Services

MBMS bearers may be used in numerous ways to provide different types of applications. MBMS user services employ MBMS bearers and possibly point-to-point bearers in order to provide application data in an efficient manner. This section is used to discuss different aspects of MBMS user services that directly relate to the usage of MBMS and point-to-point bearers. This section is not intended to deal with the architecture and interfaces of MBMS user services.

7.1 ~~Application Adjunct Entity~~ Alternative User Service Support

For ~~the many MBMS “file download” services,~~ it will be necessary to provide alternative means for the UE to access the service without using MBMS bearer capabilities. This is required, for example, after completion of the MBMS session for a file download there are several use cases where it may be beneficial for the UE to contact a network entity (the Application Adjunct Entity (AAE)) after the download is complete in order, eg, to permit errors in the file to be corrected; to permit the network to charge for a successful download; to pass a decrypt key to the UE; etc. ~~The AAE is logically part of the BM-SC. It may also be useful in cases where all or part of an MBMS transmission has been missed due to the UE being out of coverage, switched off etc.~~

~~Note: use of the AAE might also be beneficial for some MBMS Streaming services.~~

Care is needed to ensure that such alternative access mechanisms do not create ~~the uplink traffic does not~~ that overloads the network (radio, RNC, BSC, SGSN, GGSN and BM-SC). In the case that such alternative access requires direct interaction between the UE and a network server, o ~~One way for this load to be distributed is for the BM-SC to distribute to each UE, at activation time, one or more server addresses (from a group of addresses) allocate the address of (one of many) AAEs to the UE at activation time,~~ along with parameter(s) that are used to generate a random time dispersion of the ~~uplink traffic~~ requests.

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

CHANGE REQUEST

23.246 CR 041 # rev 2 # Current version: 6.1.0

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:	#	MBMS TS scope	
Source:	#	SA2 (Nortel Networks)	
Work item code:	#	MBMS	Date: # 18/02/2004
Category:	#	F	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:	#	<p>The current TS is ambiguous in scope – as presently stated the TS includes User Service standardisation, which is in fact in scope of SA4. With this scope the SA2 TS is only 50% complete, since it contains no User Service details.</p> <p>Nevertheless, it is important for SA2 to include any architectural considerations which will apply generally to MBSM User Services.</p>
Summary of change:	#	TS Scope is clarified to cover MBMS Bearer Service only. User Service Architecture section is revised appropriately.
Consequences if not approved:	#	TS will address only 50% of stated scope. Overlap in work between SA2 and SA4.

Clauses affected:	#	1, 2, 4.4.1.2,								
Other specs affected:	#	<table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 20px;">Y</td> <td style="width: 20px;">N</td> </tr> <tr> <td style="width: 20px;"> </td> <td style="width: 20px;"> </td> </tr> <tr> <td style="width: 20px;"> </td> <td style="width: 20px;"> </td> </tr> <tr> <td style="width: 20px;"> </td> <td style="width: 20px;"> </td> </tr> </table> Other core specifications # Test specifications # O&M Specifications #	Y	N						
Y	N									
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.

***** Start of changes *****

1 Scope

The present document describes the stage 2 description (architectural solution and functionalities) for [the MBMS Bearer Service](#), which includes, [together with MBMS User Services defined in \[7\], all](#) the elements necessary to realise the stage 1 requirements in 3GPP TS 22.146 [2] [and 3GPP TS 22.246 \[6\]](#).

[The present document also includes considerations on the manner in which User Services should make use of the MBMS Bearer Service described herein. It should be noted that the specification of MBMS User Services in \[7\] takes precedence over User Service aspects described in this document.](#)

The present document includes information applicable to network operators, service providers and manufacturers.

***** Next change *****

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

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

[3] 3GPP TS 23.107: "Quality of Service (QoS) concept and architecture".

[4] 3GPP TS 29.061: "Interworking between the Public Land Mobile Network (PLMN) supporting packet based services and Packet Data Networks (PDN)".

[5] 3GPP TS 33.246: "Security of Multimedia Broadcast/Multicast Service"

[6] [3GPP TS 22.246: "Multimedia Broadcast/Multicast Service \(MBMS\) user services"](#)

[7] [3GPP TS xx.yyy: "MBMS user services"](#)

[Editors note: to be updated with TS number for SA4 user services specification.](#)

***** Next change *****

4.4.1.2 Service announcement

MBMS user service announcement/discovery mechanisms shall allow users to request or be informed about the range of MBMS user services available. This includes operator specific MBMS user services as well as services from content providers outside of the PLMN. Service announcement is used to distribute to users information about the service,

parameters required for service activation (e.g. IP multicast address) and possibly other service related parameters (e.g. service start time).

Operators/service providers may consider several service discovery mechanisms. This could include standard mechanisms such as SMS, or depending on the capability of the terminal, applications that encourage user interrogation. The method chosen to inform users about MBMS user services may have to account for the user's location, (e.g. current cell, in the HPLMN or VPLMN). Users who have not already subscribed to a MBMS user service should also be able to discover MBMS user services.

The following could be considered useful for MBMS user service announcement mechanisms (not exhaustive): -

- CBS
- MBMS Broadcast mode to advertise MBMS Multicast and Broadcast user Services
- MBMS Multicast mode to advertise MBMS Multicast user Services
- PUSH mechanism (WAP, SMS-PP, MMS)
- URL (HTTP, FTP)

The details of the MBMS service announcement mechanisms are not specified, but MBMS shall allow the utilisation of solutions using IETF protocols.

[Service announcement is further defined within MBMS User Service specifications \[7\].](#)

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

CHANGE REQUEST

⌘ **23.246 CR 042** ⌘ rev **3** ⌘ Current version: **6.1.0** ⌘

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:	⌘ SGSN filtering of RAs to support RA-based optimization		
Source:	⌘ SA2 (Nortel Networks, Nokia)		
Work item code:	⌘ MBMS	Date:	⌘ 20/02/2004
Category:	⌘ C	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:	⌘ Through LS R2-040180, RAN2 and RAN3 request to be able to provide two levels of optimisations: RA-based optimisation and RNC-based one. It is proposed in this CR to indicate how the RA-based optimisation can be done: <ul style="list-style-type: none"> • the SGSN may indicate in the Session Start Request the list of RAs of PMM-IDLE mode UEs which have activated the service of each RNC. • the SGSN may send a Session Update Request message to its RNCs to update this list when needed: when a first UE arrives in a new RA not previously listed or when the last UE leaves a RA previously listed. This is a SGSN option.
Summary of change:	⌘ This CR proposes to clarify that the SGSN may indicate list RAs in the Session Start message and the use of a Session Update procedure.
Consequences if not approved:	⌘ RAN will page in all its RAs while this is useless.

Clauses affected:	⌘ 8.3										
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> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></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"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other core specifications Test specifications O&M Specifications	⌘
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<input type="checkbox"/>	<input checked="" type="checkbox"/>										
<input type="checkbox"/>	<input checked="" type="checkbox"/>										
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.

8.3 MBMS Session Start Procedure

The BM-SC initiates the MBMS Session Start procedure 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.

Through this procedure, MBMS session attributes such as QoS, MBMS service Area (tracking/non-tracking area are FFS), estimated session duration if available are provided to the GGSN(s) and SGSN(s) that have previously registered for the corresponding MBMS bearer service and to all BSCs/RNCs that are connected to a registered SGSN. In addition the procedure allocates the bearer plane to all registered GGSNs and all registered SGSNs and to BSCs/RNCs that respond to the session start accordingly.

The overall Session Start procedure is presented in the following figure:

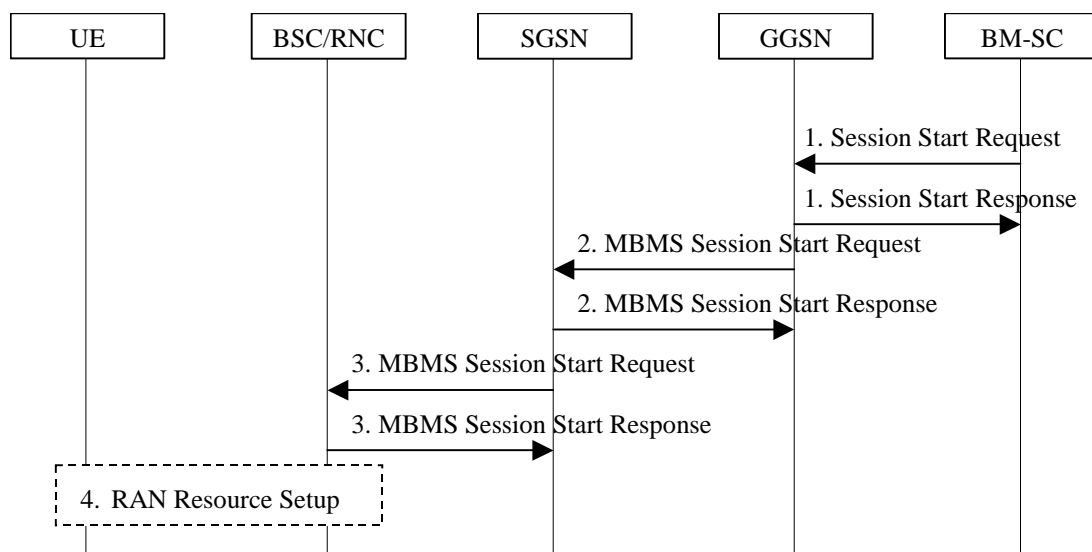


Figure 8 Session Start procedure

1. The BM-SC sends a Session Start Request 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'. 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 Session Start Response message to the BM-SC.
2. The GGSN sends an MBMS Session Start Request message to the SGSNs listed in the "list of downstream nodes" parameter of the corresponding MBMS Bearer Context. The SGSN stores the session attributes in the MBMS Bearer Context, sets the state attribute of its MBMS Bearer Context to 'Active' and responds with an MBMS Session Start Response message providing the TEID for bearer plane that the GGSN shall use for forwarding the MBMS data.
3. The SGSN sends an MBMS Session Start Request message including the session attributes to each BSC/RNC that is connected to this SGSN. [The SGSN may include a list of RAs which lists each RA that contains at least one PMM-IDLE UE that has activated the MBMS bearer service..This list may be empty.](#) The BSC/RNC responds with an MBMS Session Start Response to the SGSN. If the BSC/RNC serves the MBMS Service Area it stores the session attributes in the MBMS Service Context, sets the state attribute of its MBMS Service Context to 'Active' and responds with an MBMS Session Start Response message and the RNC includes the TEID in the MBMS Session Start Response message for the Iu bearer plane that the SGSN shall use for forwarding the MBMS data. An RNC receiving multiple MBMS Session Start Request messages includes Iu bearer plane parameters only into one MBMS Session Start Response message to establish only one Iu bearer plane to one SGSN.
4. The BSC/RNC establishes the necessary radio resources for the transfer of MBMS data to the interested UEs.

Note: The upstream node normally provides the MBMS Session Start Request message once per MBMS session to a downstream node. Due to “Intra Domain Connection of RAN Nodes to Multiple Core Network Nodes” however, an RNC may receive the MBMS Session Start Request message from several SGSNs.

8.x.x MBMS Session Update procedure

If the SGSN has provided a list of RAs in the Session Start message (even if the list was empty) and RAs are added or removed from the list, the SGSN uses the MBMS Session Update procedure to inform the RNCs that the list has changed. The SGSN sends the Session Update message only to the RNCs that are affected by the list change. The procedure is used only during the session and when SGSN has already sent a Session Start to the RNC.

The SGSN may send the Session Update to a RNC when:

- The first UE which have activated the service enters in a RA
- The last UE which have activated the service leaves from a RA

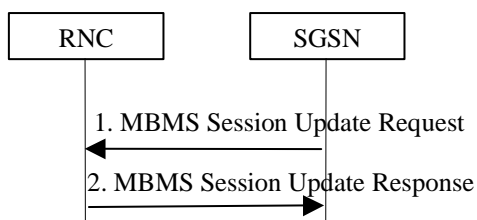


Figure x. Session Update procedure

- 1) The SGSN sends MBMS Session Update Request message to a RNC.
- 2) The RNC acknowledges the Session Update Request with the MBMS Session Update Response message.

CR-Form-v7

CHANGE REQUEST

23.246 CR 043 # rev - # Current version: 6.1.0

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:	# Complete the MBMS Service Request Procedure		
Source:	# SA2 (Nortel Networks)		
Work item code:	# MBMS	Date:	# 19/01/2004
Category:	# F	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:	# Tdoc S2-033997 (CR 027) on the Service Request procedure has been agreed at New York SA2 meeting. Nevertheless, it has been only partially included in the MBMS TS 23.246.		
Summary of change:	# Add the missing part of the CR in chapter 8.16.		
Consequences if not approved:	# Agreed CR wrongly implemented		

Clauses affected:	# 8.16										
Other specs affected:	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="width: 20px; text-align: center;">#</td> <td style="width: 20px; text-align: center;">#</td> </tr> <tr> <td style="width: 20px; text-align: center;">#</td> <td style="width: 20px; text-align: center;">#</td> </tr> <tr> <td style="width: 20px; text-align: center;">#</td> <td style="width: 20px; text-align: center;">#</td> </tr> </table>	Y	N	#	#	#	#	#	#	Other core specifications	#
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#	#										
#	#										
		Test specifications	#								
		O&M Specifications	#								
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.

8.16 MBMS Service Request Procedure

For MBMS, when UTRAN wants to count the number of users that are interested in a specific MBMS service present in a cell, it will request a percentage of the interested UEs to transit to PMM-CONNECTED state. The MBMS Service Request procedure is used by a UE in PMM-IDLE state to move to PMM-CONNECTED state.

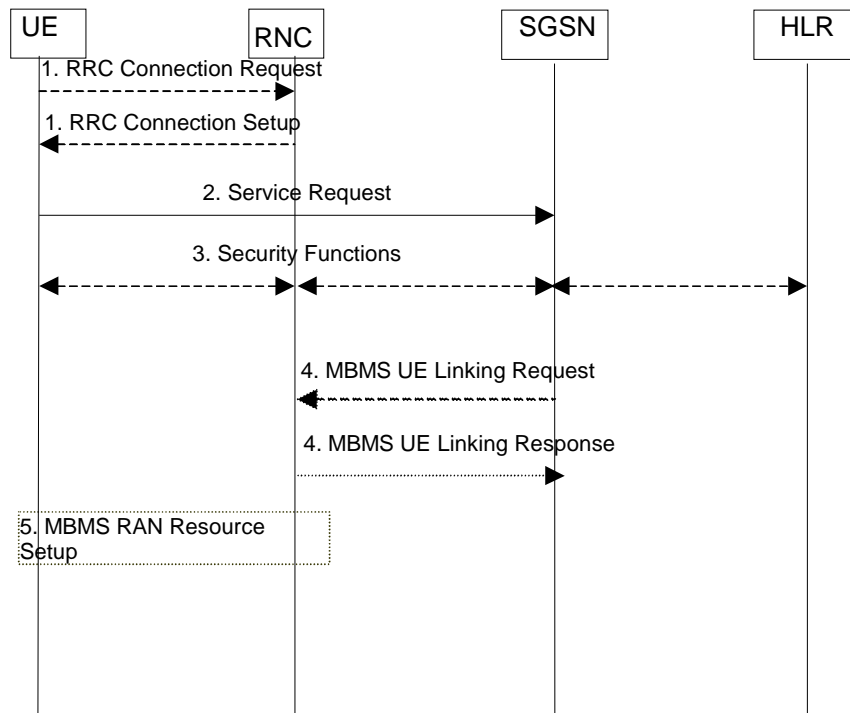


Figure x: MBMS Service Request procedure

- 2) The UE sends a Service Request message to the SGSN if required to do so by the RAN after a MBMS Session Starts.
- 3) The SGSN may perform the security functions.
- 4) The SGSN provides RAN with the MBMS UE context(s) via MBMS UE Linking procedure
- 5) The RNC establishes the necessary radio resources for the transfer of MBMS data to the interested UEs.

Atlanta, USA, 16-20 February 2004

CR-Form-v7

CHANGE REQUEST

№ **23.246 CR 044** № rev **1** № Current version: **6.1.0** №

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:	№	Correction on De-Registration Procedure	
Source:	№	SA2 (Samsung)	
Work item code:	№	MBMS	Date: № 18/02/2004
Category:	№	F	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	Rel-4 (Release 4)
		be found in 3GPP TR 21.900 .	Rel-5 (Release 5)
			Rel-6 (Release 6)

Reason for change:	№	The BM-SC initiated de-registration procedure should release all MBMS bearer contexts and MBMS UE contexts, but in this procedure, current sequences of step 3 and step 4 are causing confusions since step 3 releases all contexts while step 4 releases bearer planes according to the contexts which have been released.
Summary of change:	№	Exchange the sequence of step 3 and step 4 in figure 12 and the description.
Consequences if not approved:	№	The BM-SC initiated de-registration procedure is incorrect.

Clauses affected: № 8.6.1

Other specs affected:	⌘	<table border="1"><tr><td>Y</td><td>N</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>	Y	N					Other core specifications	⌘	
	Y	N									
		Test specifications									
		O&M Specifications									
Other comments:	⌘										

How to create CRs using this form:

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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.

8.6.1 BM-SC initiated MBMS De-Registration Procedure

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 and associated MBMS UE Contexts in the nodes along the distribution tree.

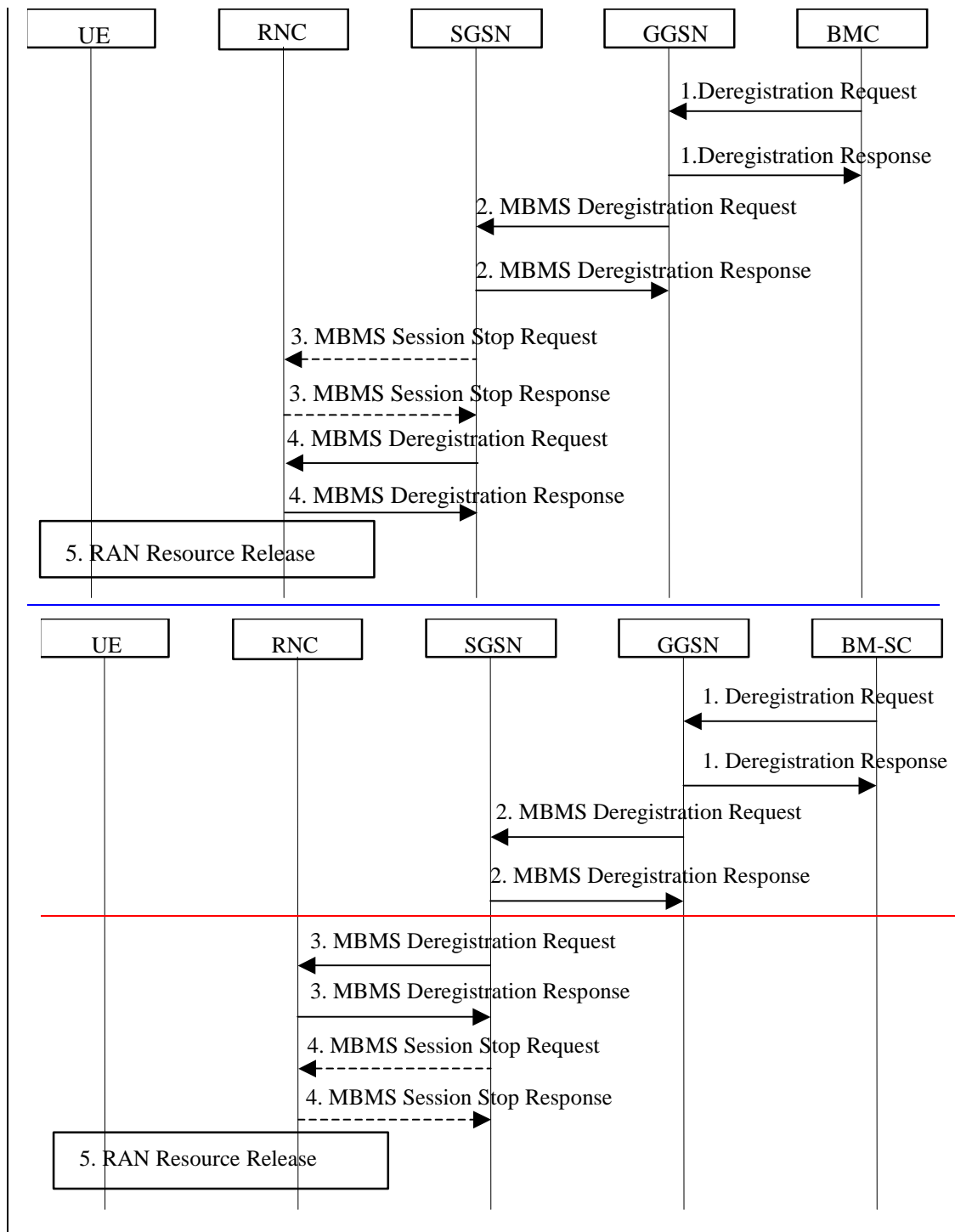


Figure 12: BM-SC initiated MBMS De-Registration Procedure

1. The BM-SC sends a De-Registration Request message to all GGSNs contained in the "list of downstream nodes" parameter of the corresponding MBMS Bearer Context to indicate the session is terminated and any related MBMS bearer resources shall be released.

The GGSN returns a De-Registration Response 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.

2. The GGSN sends an MBMS De-Registration Request message to all SGSNs contained in the "list of downstream nodes" parameter. of the corresponding MBMS Bearer Context. The SGSN returns an MBMS De-registration Response message to the GGSN. The GGSN releases all MBMS UE Contexts and the affected MBMS Bearer Context. If a bearer plane had been established over Gi for this MBMS bearer service, the bearer plane is released.
3. If the state attribute of the MBMS Bearer Context is 'Active' the SGSN sends an MBMS Session Stop Request message to all RNCs that are not listed in the "list of downstream nodes" but have a bearer plane established with the SGSN. The RNC releases all bearer resources and returns an MBMS Session Stop Response message to the SGSN.
- ~~34.~~ The SGSN sends an MBMS De-Registration Request message to all RNCs listed in the "list of downstream nodes" parameter of the corresponding MBMS Bearer Context. The RNC returns an MBMS De-Registration Response message to the SGSN, and releases all bearer resources if the state attribute of the MBMS Service Context is 'Active'. The SGSN releases all MBMS UE Contexts and the affected MBMS Bearer Context. If a bearer plane had been established between the SGSN and the GGSN for this MBMS bearer service, the bearer plane is released.
- ~~4. If the state attribute of the MBMS Bearer Context is 'Active' the SGSN sends an MBMS Session Stop Request message to all RNCs that have a bearer plane established with the SGSN. The RNC releases all bearer resources and returns an MBMS Session Stop Response message to the SGSN.~~
5. The RNC releases the affected radio resources and the MBMS Service Context. The detailed procedures are FFS depending on ongoing work in RAN groups. RAN may notify the UEs that the MBMS Bearer service has being terminated, so that the UE can locally deactivate its MBMS UE context, detailed procedures are FFS.

CR-Form-v7

CHANGE REQUEST

23.246 CR 049 # rev # Current version: 6.1.0

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:	# TMGI Definition and Objective		
Source:	# SA2 (Motorola, Siemens)		
Work item code:	# MBMS	Date:	# 09/02/2004
Category:	# C	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:	# This CRs reflected the recommendation from GERAN and the decision made at the last S2 meeting to make the TMGI a global unique identifier.
Summary of change:	# Clarify definition and objective of TMGI.
Consequences if not approved:	# TMGI may not be unique

Clauses affected:	# 6.4				
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> Other core specifications #	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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Other comments:	#				

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6.4 Temporary Mobile Group Identity

Temporary Mobile Group Identity (TMGI) is used for MBMS notification purpose. The BM-SC allocates a [globally unique](#) TMGI per MBMS bearer service ~~that is unique within HPLMN~~. [The TMGI contains two parts: Globally unique MCC/MNC \(PLMN ID\) and a local MBMS bearer service identity that is unique within the PLMN](#). For Multicast MBMS bearer services the TMGI will be transmitted to UE via service activation procedure. For Broadcast Service the TMGI can be obtained via service announcement see “Service Announcement”.

[The TMGI is a radio resource efficient MBMS bearer service identification, which is equivalent to the MBMS bearer service identification consisting of IP multicast address and APN.](#)

CHANGE REQUEST

23.246 CR 050 # rev **1** # Current version: **6.1.0**

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:	# NSAPI in MBMS Multicast Service Activation		
Source:	# SA2 (Huawei)		
Work item code:	# MBMS	Date:	# 19/02/2004
Category:	# F	Release:	# Rel-6
	<p>Use <u>one</u> of the following categories:</p> <p>F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP TR 21.900.</p>		<p>Use <u>one</u> of the following releases:</p> <p>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)</p>

Reason for change:	# In the current Delete MBMS Context Request of MBMS multicast service deactivation procedure, "NSAPI" is used by the SGSN to identify the MBMS UE Context which is held in the GGSN. But there is no description about how the NSAPI is created and transmitted.
	In Stage 3, it states that the NSAPI is chosen by the UE and included in the Activation MBMS Context Request message which is sent to the network at the time of activation.
	Although the NSAPI is a topic of stage 3 level, it is contained in the current service deactivation procedure, so it should be defined in more detail. Also by renaming the NSAPI to MBMS_NSAPI, the MBMS multicast service activation and deactivation procedures should be clearer.
Summary of change:	# The information element NSAPI is renamed to MBMS_NSAPI. Clarification about the MBMS_NSAPI is included in the MBMS multicast activation procedure. The MBMS_NSAPI is added to the MBMS UE Context.
Consequences if not approved:	# Continued usage of term NSAPI may cause confusion. The MBMS multicast service activation and deactivation procedures will remain incomplete and unclear.

Clauses affected:	# 6.1, 8.2, 8.7												
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> <td></td> </tr> <tr> <td style="text-align: center;">#</td> <td style="text-align: center;">X</td> <td>Other core specifications</td> </tr> <tr> <td style="text-align: center;">#</td> <td style="text-align: center;">X</td> <td>Test specifications</td> </tr> <tr> <td style="text-align: center;">#</td> <td style="text-align: center;">X</td> <td>O&M Specifications</td> </tr> </table>	Y	N		#	X	Other core specifications	#	X	Test specifications	#	X	O&M Specifications
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#	X	Other core specifications											
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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.

*******First Change*******

6.1 MBMS UE Context

The MBMS UE Context contains UE-specific information related to a particular MBMS bearer service that the UE has joined. An MBMS UE Context is created in the UE, SGSN and GGSN when the UE joins an MBMS bearer service. In the SGSN, an MBMS UE Context is also created as a result of an inter-SGSN routing area update after the transfer of the MBMS UE Context from the old SGSN. It is FFS whether MBMS UE Contexts are created in the BM-SC.

In Iu mode, all MBMS UE Contexts of a UE are provided via MBMS UE Linking mechanism to the BSC/SRNC at least when the first PS RAB is established for the UE, or when the UE performs MBMS Multicast Service Activation. MBMS UE Contexts are provided to the BSC/SRNC regardless whether MBMS Sessions are ongoing or not (i.e. before, between and after Sessions). In addition, all MBMS UE Contexts of a UE are provided via MBMS UE Linking mechanism when a UE, which has an MBMS context active, moves to PMM-Connected state via the MBMS Service Request procedure for the purpose of MBMS.

The existence of the MBMS UE context for Gb mode in the BSC is for further study.

In the UE and SGSN, the MBMS UE Context is stored as part of the MM Context for the UE. The MBMS UE Context is stored in the GGSN. There is one MBMS UE Context per MBMS bearer service that the UE has joined.

In the BSC/RNC, the MBMS UE Contexts are stored as part of the UE Context of the BSC/RNC.

The content of the MBMS UE Context is described in Table 1.

Table 1: MBMS UE Context

Parameter	Description	UE	SGSN	GGSN	RNC	BSC	BM-SC
IP multicast address	IP multicast address identifying an MBMS bearer that the UE has joined.	X	X	X	X	Iu - X Gb - FFS	FFS
APN	Access Point Name on which this IP multicast address is defined.	X	X	X	X	Iu - X Gb - FFS	
TMGI	Temporary Mobile Group Identity allocated to the MBMS bearer.	X					
Linked NSAPI	NSAPI of the PDP context used by the UE to carry IGMP/MLD signalling.	X	X				
IMSI	IMSI identifying the user.	(1)	(1)	X	(2)	FFS	
MBMS_NSAPI	Network layer Service Access Point Identifier which identifies an MBMS UE Context.	X	X	X			
FFS	FFS						

(1) In the UE and SGSN, the IMSI is available within the MM Context which contains the MBMS UE Context

(2) In the RNC, the IMSI is available within the UE Context which contains the MBMS UE Context.

*******Second Change*******

8.2 MBMS Multicast Service Activation

The MBMS multicast service activation procedure registers the user in the network to enable the reception of data from a specific multicast MBMS bearer service. The activation is a signalling procedure between the UE and the network. The procedure establishes MBMS UE contexts in UE, SGSN and GGSN and BSC/RNC for each activated multicast MBMS bearer service comparable to regular PDP contexts.

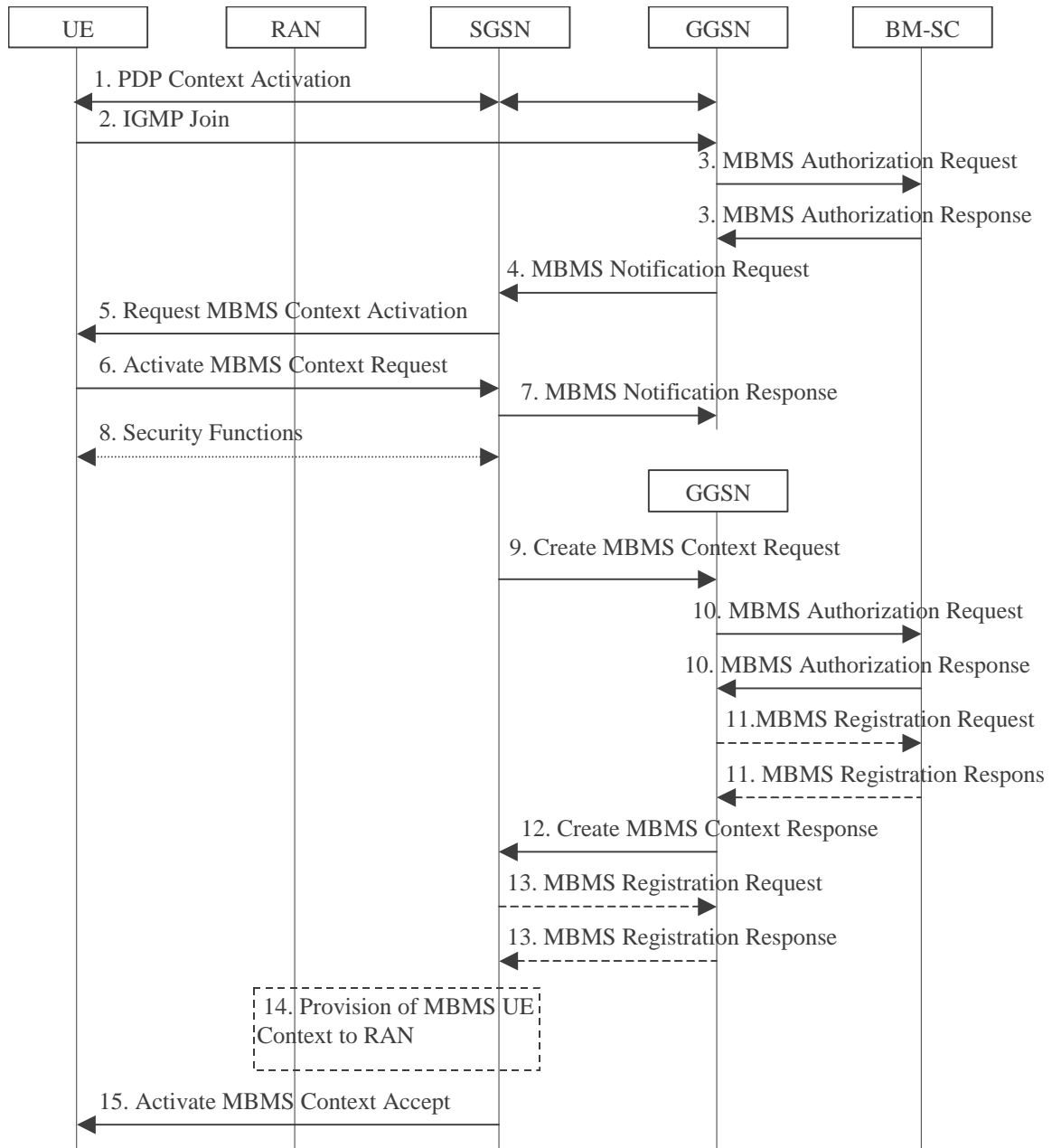


Figure 7: The activation of an MBMS multicast service

1. The UE activates a default, typically best-effort PDP context if not already established. This can be a PDP context used for basic IP services like WAP or Internet access, or it might be the signalling PDP context used for IMS access.
2. The UE sends an IGMP (IPv4) or MLD (IPv6) Join message over the default PDP context to signal its interest in receiving a particular multicast MBMS bearer service identified by an IP multicast address.
3. The GGSN sends an MBMS Authorization Request seeking authorization for the activating UE to receive data. The authorization decision is provided in the MBMS Authorization Response together with the APN to be used for creation of the MBMS UE context. If the MBMS Authorization Response 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 Request MBMS Context Activation (IP multicast address, APN, Linked NSAPI) to the UE to request it to activate an MBMS context. Linked NSAPI allows the UE to associate the MBMS Context with the PDP context over which it sent the IGMP/MLD Join message in step 2.
6. The UE creates an MBMS UE context and sends an Activate MBMS Context Request (IP multicast address, APN, [MBMS NSAPI](#), MBMS bearer capabilities) to the SGSN. The IP multicast address identifies the MBMS multicast service, which the UE wants to join/activate. An APN may indicate a specific GGSN. The MBMS bearer capabilities indicate the maximum QoS the UE can handle. [The MBMS NSAPI was chosen by the UE and contains a value not used by any other activated PDP context and MBMS UE context for this UE.](#)
7. 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 (Cause is FFS). 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].
8. Security Functions may be performed, e.g. to authenticate the UE.
9. It is FFS whether the SGSN performs a subscription check for the requested MBMS bearer service identified by the IP multicast address and APN or whether another network entity performs this check. The SGSN creates an MBMS UE context and sends a Create MBMS Context Requests (IP multicast address, APN, [MBMS NSAPI](#)) to the GGSN.
10. The GGSN sends an MBMS Authorization Request seeking authorization for the activating UE. The authorization decision is provided in the MBMS Authorization Response.
11. If the GGSN does not have the MBMS Bearer Context information for this MBMS bearer service, the GGSN sends a MBMS Registration Request to the BM-SC. See subclause "MBMS 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 and SGSN via the MBMS Registration Response message and further to UE via Activate MBMS Context Accept message.

The BM-SC responds with a MBMS Registration Response 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 "MBMS Registration Procedure".
12. The GGSN creates an MBMS UE context and sends a Create MBMS Context Response to the SGSN.
13. If the SGSN does not have the MBMS Bearer Context information for this MBMS bearer service, the SGSN sends a MBMS Registration Request to the GGSN. See subclause "MBMS Registration Procedure".

The GGSN responds with a MBMS Registration Response containing the MBMS Bearer Context information for this MBMS bearer service and adds the identifier of the SGSN to the "list of downstream nodes" parameter in its MBMS Bearer Context. See subclause "MBMS Registration Procedure".
14. The SGSN provides RAN with the MBMS UE Context(s) if at least one PS RAB is established for the UE.
15. The SGSN sends an Activate MBMS Context Accept (MBMS bearer capabilities) to the UE. The MBMS bearer capabilities indicate the maximum QoS that is used by this MBMS bearer service and the UE may take it into account when further MBMS bearer services are activated. If the SGSN determines that the UE's MBMS bearer capabilities are lower than the Required MBMS Bearer Capabilities the SGSN rejects the request for activation of an MBMS context indicating an appropriate cause and starts the deactivation of the already established MBMS UE contexts.

*****Third Change*****

8.7 MBMS Multicast Service Deactivation

The multicast service deactivation is a signalling procedure between the UE and the network. The procedure removes the MBMS UE Context from the UE, SGSN and GGSN for a particular MBMS multicast service. The multicast service deactivation can be initiated by:

- The UE;
- The GGSN;
- The BM-SC; or
- The SGSN

All these cases are contained in the procedure illustrated in figure 13. The UE initiated Multicast Service Deactivation starts with step 1), the BM-SC initiated Multicast Service Deactivation starts with step 3), the GGSN initiated Multicast Service Deactivation starts with step 4), and the SGSN initiated Multicast Service Deactivation starts with step 5) or 8).

At GPRS detach, all MBMS UE contexts of the UE are implicitly deactivated in the UE, SGSN and GGSN, i.e. the SGSN performs the deactivation procedure starting with step 8).

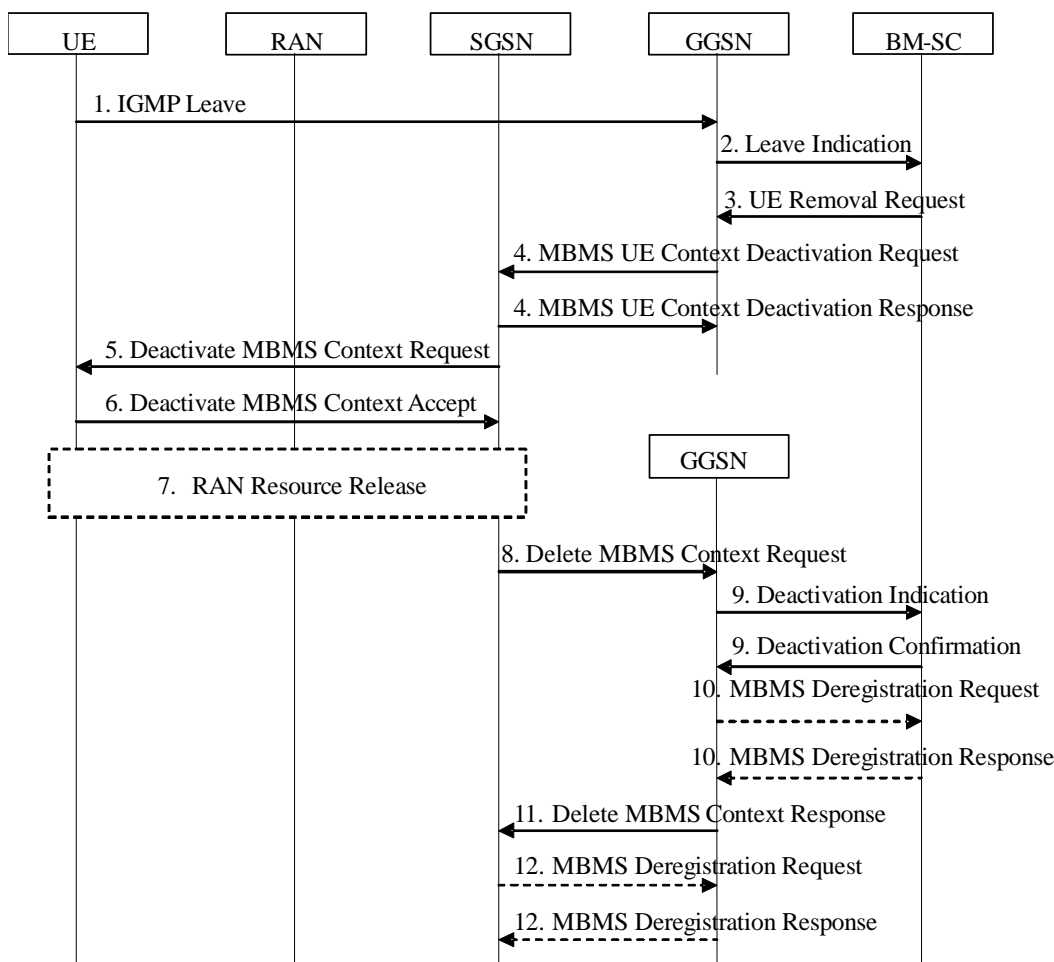


Figure 13: MBMS Multicast Service Deactivation

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 Leave Indication (IP multicast address, IMSI) to the BM-SC, indicating that the UE is requesting to leave the multicast service identified by the IP multicast address. The exact nature of the signalling between GGSN and BM-SC is however FFS in general.

3. Upon reception of the Leave Indication, the BM-SC verifies that the IP multicast address corresponds to a valid MBMS bearer service and sends a UE Removal Request (IP multicast address, APN, IMSI) to the GGSN that originated the Leave Indication. The APN shall be the same that was provided during service activation (see "MBMS Multicast Service Activation"). The exact nature of the signalling between GGSN and BM-SC is however FFS in general. The BM-SC may also initiate the deactivation of an MBMS UE Context for service-specific reasons (e.g. the service is terminated but the UE has not yet left the multicast group) by directly sending a UE Removal Request message to the GGSN.
4. Upon reception of the UE Removal Request or for other reasons (e.g. Error cases), the GGSN sends an MBMS UE Context Deactivation Request (IP multicast address, APN, IMSI) 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. The SGSN acknowledges reception of the MBMS UE Context Deactivation Request by sending an MBMS UE Context Deactivation Response to the GGSN.
5. Upon reception of the MBMS UE Context Deactivation Request or for other reasons (e.g. due to a change in the roaming restrictions for the user) the SGSN sends a Deactivate MBMS Context Request (TI) to the UE. The TI identifies the MBMS UE Context to be deleted by the UE.
6. The UE deletes the MBMS UE Context and sends a Deactivate MBMS Context Accept (TI) to the SGSN.
7. If dedicated radio resources are currently assigned to the UE for the reception of the MBMS data, the RAN releases these radio resources. If shared radio resources are currently assigned for the distribution of the MBMS data, the RAN may decide to move the remaining UEs to dedicated resources. The detailed procedures and conditions are FFS depending on ongoing work in RAN groups.
8. Upon reception of the Deactivate MBMS Context Accept or for other reasons (e.g. due to missing periodic updates) the SGSN sends a Delete MBMS Context Request ([MBMS](#)_NSAPI) to the GGSN that holds the MBMS UE Context. This GGSN may be different from the GGSN that receives IGMP Leave request in step 1.
9. The GGSN deletes the MBMS UE Context and sends a Deactivation Indication to the BM-SC to confirm the successful deactivation of the MBMS UE Context. The BM-SC, after receiving the Deactivation Indication, deletes the MBMS UE Context and sends a confirmation to the GGSN. The exact nature of the signalling between GGSN and BM-SC is however FFS in general.
10. 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 sends a MBMS De-Registration Request to the BM-SC. The BM-SC responds with a MBMS De-Registration Response and removes the identifier of the GGSN from the "list of downstream nodes" parameter in its MBMS Bearer Context. See subclause "MBMS De-Registration Procedure".
11. The GGSN confirms the deactivation of the MBMS UE Context to the SGSN by sending a Delete MBMS Context Response to the SGSN, which then deletes the MBMS UE Context.
12. If the SGSN does not have any more users interested in this MBMS bearer service and the "list of downstream nodes" in the corresponding MBMS Bearer Context is empty, the SGSN sends an MBMS De-Registration Request to the GGSN. The GGSN responds with an MBMS De-Registration Response and removes the identifier of the SGSN from the "list of downstream nodes" parameter in its MBMS Bearer Context. See subclause "MBMS De-Registration Procedure".