

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 #24.
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
S2-042308	Optimization of MBMS multicast service activation procedure	23.246	051r4	F	6.2.0	6	MBMS	S2 #40	8.2
S2-041200	Correction of erroneous references	23.246	052r1	D	6.2.0	6	MBMS	S2 #39	3.1, 3.2, 4.1
S2-041506	Session duration on Broadcast Session Start Procedure	23.246	056r1	F	6.2.0	6	MBMS	S2 #39	8.14
S2-041631	Removing FFS from TS 23.246	23.246	057r3	F	6.2.0	6	MBMS	S2 #39	2, 8.2; 8.3; 8.4, 8.14
S2-042306	Clarification on relationships between MBMS Session Stop & MBMS De-registration & MBMS De-activation	23.246	058r3	D	6.2.0	6	MBMS	S2 #40	2, 8.6; 8.7
S2-041507	Remove some FFS on PMM-CONNECTED vs RRC-CONNECTED UEs	23.246	059r1	F	6.2.0	6	MBMS	S2 #39	8.1.1
S2-042304	Correction on MBMS deregistration procedure	23.246	061r2	F	6.2.0	6	MBMS	S2 #40	2, 8.6.1
S2-042307	New addition to MBMS bearer context	23.246	062r3	F	6.2.0	6	MBMS	S2 #40	6.2
S2-041791	CR for MBMS UE Context in 6.1	23.246	066r3	F	6.2.0	6	MBMS	S2 #40	6.1
S2-041774	Removing Security requirements from 23.246	23.246	069r1	F	6.2.0	6	MBMS	S2 #40	5.1.1
S2-042335	Proposed Flow Based Charging for MBMS	23.246	077r2	F	6.2.0	6	MBMS	S2 #40	2; 5.7.1 ; 10; and new sections 10.1, 10.2 and 10.3
S2-041783	Notification of Incoming CS Domain Call/PS Data/Additional MBMS Call during An Ongoing MBMS Session for GERAN	23.246	078r1	F	6.2.0	6	MBMS	S2 #40	The section 8.17 is modified.
S2-042305	Clarification of MBMS subscription	23.246	083r2	F	6.2.0	6	MBMS	S2 #40	4.4.1.1, 8.2

CHANGE REQUEST

23.246 CR 051 # rev **4** # Current version: **6.2.0**

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:	# Optimization of MBMS multicast service activation procedure		
Source:	# SA2 (Huawei)		
Work item code:	# MBMS	Date:	# 21/05/2004
Category:	# F	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:	<p># Currently Stage 2 specifies a solution for verification of UE bearer capabilities. The SGSN verifies the UE's bearer capabilities at the end of the activation procedure. If the SGSN determines that the UE's MBMS bearer capabilities are less than the Required MBMS Bearer Capabilities, the SGSN starts the deactivation of the already established MBMS UE contexts.</p> <p>However, in most cases, the SGSN registers at the GGSN after the first UE has successfully joined the MBMS bearer service. So, it is more reasonable for the SGSN to verify the UE's MBMS bearer capabilities and reject UEs whose MBMS bearer capabilities are less than the Required MBMS Bearer Capabilities as soon as the SGSN gets the Activate MBMS Context Request. The upstream nodes need not to create and then deactivate the MBMS UE Contexts.</p> <p>Furthermore, it is beneficial for UE power consumption and reduces complexity.</p> <p>In the MBMS Multicast Service Activation procedure, two changes are made to align with Stage 3 work based on current Stage 3 specifications and the LS in S2-033911.</p>
Summary of change:	<p># Adds information about the SGSN verification of UE's bearer capabilities at the end of step 6 of MBMS multicast service activation procedure. Updates step 15 to clarify that bearer capabilities may have been checked in step 6.</p> <p>The MBMS Multicast Service Activation procedure (Figure 7) is modified by moving step 7 (MBMS Notification Response) directly after step 4 (MBMS Notification Request). These steps become 4a and 4b. The flow description for step 4b (MBMS Notification Response) is updated to reflect the update.</p>

		A new Step 7 is added which contains the MBMS Notification Reject Request and MBMS Notification Reject Response flows.
Consequences if not approved:	⌘	<p>The SGSN has to verify the UE's bearer capabilities at the end of the activation procedure even it already registered at the GGSN. The UEs with MBMS bearer capabilities that are less than the Required MBMS Bearer Capabilities will cause unnecessary handling in most cases.</p> <p>In the MBMS Multicast Service Activation procedure, the signaling with respect to the MBMS Notification Request and Response flows will not be aligned with Stage 3 work.</p>

Clauses affected:	⌘	8.2								
Other specs affected:	⌘	<table border="1"> <thead> <tr> <th>Y</th> <th>N</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> </tbody> </table> <p>Other core specifications ⌘</p> <p>Test specifications</p> <p>O&M Specifications</p>	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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Other comments:	⌘	CR 057 (S2-041631) also change subclause 8.2. However, this CR and CR 057 can be applied independently.								

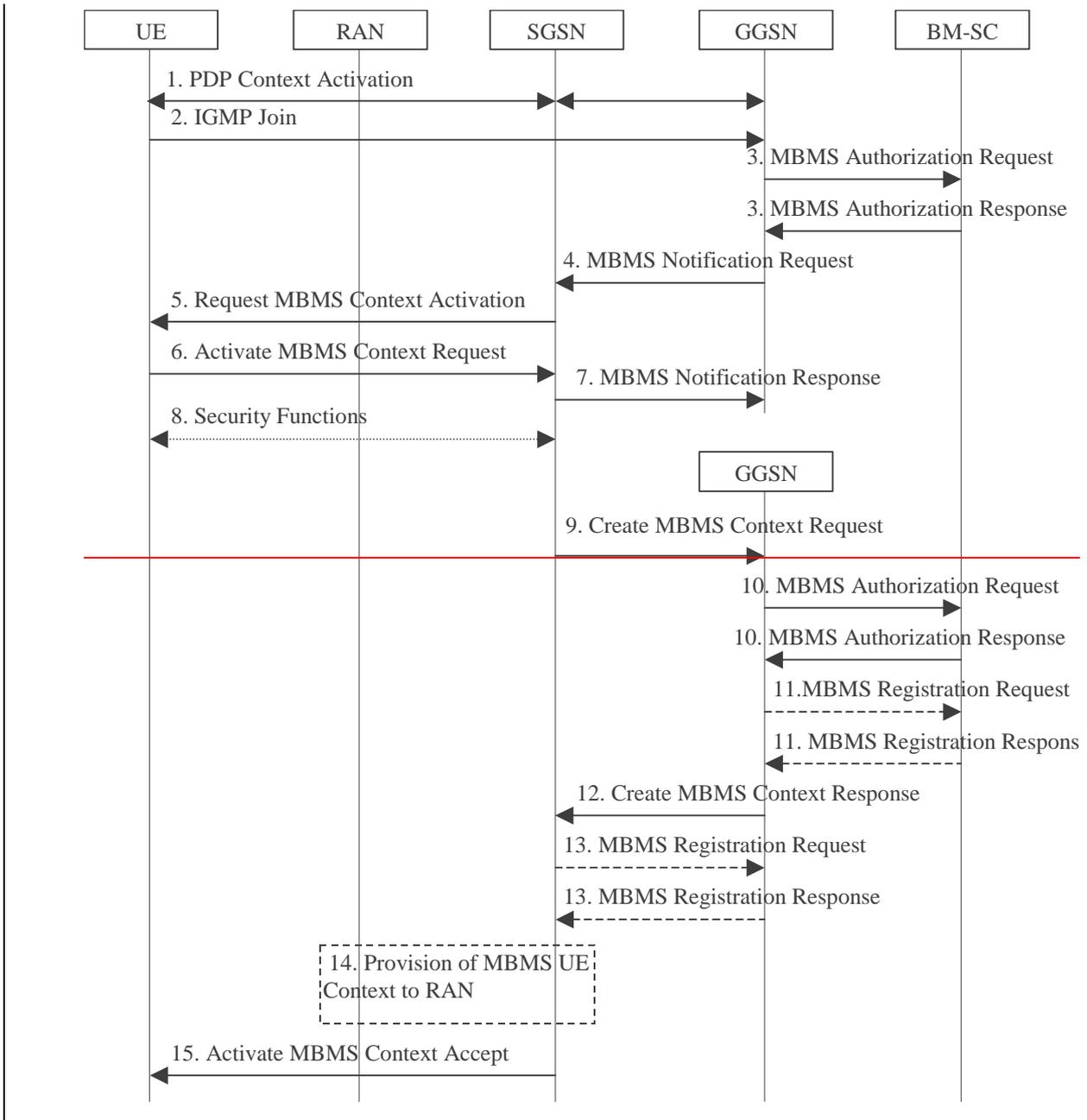
How to create CRs using this form:

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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.

8.2 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.



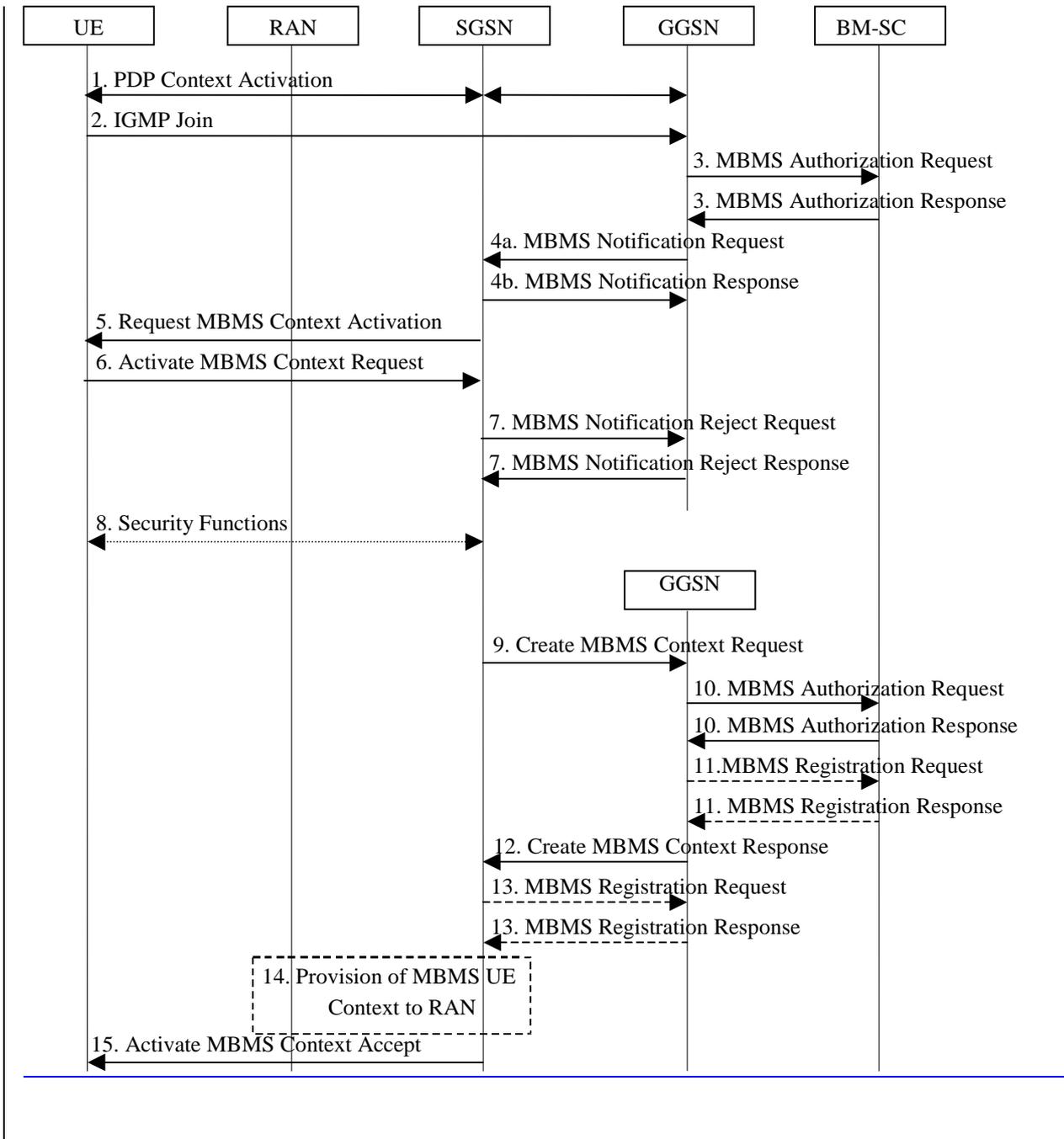


Figure 7: The activation of an MBMS multicast service

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.
- 4a. 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.

- 4b. The SGSN sends a MBMS Notification Response (Cause) to the GGSN that sent the MBMS Notification Request, where Cause shall indicate whether or not the MBMS context activation will proceed. 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].
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. If the SGSN has the MBMS Bearer Context information for this MBMS bearer service, the SGSN should verify the UE's MBMS bearer capabilities. If the SGSN determines that the UE's MBMS bearer capabilities are less than the Required MBMS Bearer Capabilities, it shall reject the request for activation of an MBMS context with an appropriate cause.
 7. If the MBMS UE Context was not established, the SGSN sends a MBMS Notification Reject Request (Cause) to the GGSN that sent the MBMS Notification Request, where Cause shall indicate the reason why the MBMS UE Context could not be established. The GGSN then sends a MBMS Notification Reject Response back to the SGSN. This should prevent further sending of MBMS Notification Request messages. The procedure is then terminated.
 - ~~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 it was not possible to verify the UE's MBMS bearer capabilities in Step 6, the UE's MBMS bearer capabilities will be verified now.](#) 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 052** ⌘ rev **1** ⌘ Current version: **6.2.0** ⌘

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 of erroneous references		
Source:	⌘ SA2 (Huawei)		
Work item code:	⌘ MBMS	Date:	⌘ 20/04/2004
Category:	⌘ D	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 TS 23.246 v6.2.0, there are several references that are incorrect.
Summary of change:	⌘ This CR corrects several references.
Consequences if not approved:	⌘ The incorrect references may cause confusion when reading TS 23.246.

Clauses affected:	⌘ 3.1, 3.2, 4.1										
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="text-align: center;">Y</td> <td style="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	⌘
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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*******

3.1 Definitions

For the purposes of the present document, the terms and definitions defined in 3GPP ~~TS~~-TR 21.905 [1] and 3GPP TS 22.146 [2] and the following apply:

MBMS Service Announcement: Mechanism to allow users to be informed about the MBMS user services available.

MBMS Bearer Service: the service provided by the PS Domain to MBMS User Services to deliver IP multicast datagrams to multiple receivers using minimum network and radio resources.

MBMS User Service: the MBMS service provided to the end user by means of the MBMS Bearer Service and possibly other capabilities.

MBMS Service Area: The area in which a specific MBMS Bearer Service is available. It is defined individually per MBMS Bearer Service.

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

3.2 Abbreviations

For the purposes of the present document, the abbreviations in 3GPP ~~TS~~-TR 21.905 [1] and 3GPP TS 22.~~141~~-146 [2] apply.

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

4.1 Overview

MBMS is a point-to-multipoint service in which data is transmitted from a single source entity to multiple recipients. Transmitting the same data to multiple recipients allows network resources to be shared.

The MBMS bearer service offers two modes:

- Broadcast Mode
- Multicast Mode

MBMS architecture enables the efficient usage of radio-network and core-network resources, with an emphasis on radio interface efficiency.

MBMS is realised by the addition of a number of new capabilities to existing functional entities of the 3GPP architecture and by addition of a number of new functional entities.

The existing PS Domain functional entities (GGSN, SGSN, UTRAN, GERAN and UE) are enhanced to provide the MBMS Bearer Service. In the bearer plane, this service provides delivery of IP Multicast datagrams from the Gi reference point to UEs with a specified Quality of Service. In the control plane, this service provides mechanisms for:

- managing the MBMS bearer service activation status of UEs (in the case of multicast mode)

- outsourcing authorisation decisions to the MBMS User Service (i.e. to the BM-SC) (in the case of multicast mode)
- providing control of session initiation/termination by the MBMS User Service and managing bearer resources for the distribution of MBMS data (in the case of multicast and broadcast modes)

A particular instance of the MBMS Bearer Service is identified by an IP Multicast Address and an APN Network Identifier.

| The boundary of the MBMS Bearer Service is the Gmb and Gi reference points as shown in [Section 4.3](#) [Figure 1](#) below. The former provides access to the control plane functions and the latter the bearer plane.

A functional entity, the Broadcast Multicast Service Centre (BM-SC) provides a set of functions for MBMS User Services. BM-SC functions for different MBMS User Services may be supported from the same or different physical network elements.

CHANGE REQUEST

⌘ **23.246 CR 056** ⌘ rev **1** ⌘ Current version: **6.2.0** ⌘

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

Title:	⌘ Session duration on Broadcast Session Start Procedure		
Source:	⌘ SA2 (Huawei)		
Work item code:	⌘ MBMS	Date:	⌘ 20/04/2004
Category:	⌘ F	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:	⌘ In SA2#36 meeting, it was agreed that the BM-SC could optionally provide the estimated duration of the data transfer of a session. Transmitting this parameter is also needed in the MBMS Broadcast Session Start procedure.
Summary of change:	⌘ Add "estimated session duration" as an optional parameter in the MBMS Broadcast Session Start procedure.
Consequences if not approved:	⌘ Some radio architecture optimization cannot be done for MBMS Broadcast.

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> Other core specifications	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	⌘	
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Y	N						
<input type="checkbox"/>	<input checked="" type="checkbox"/>						
Other comments:	⌘						

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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), [estimated session duration if available](#) 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:

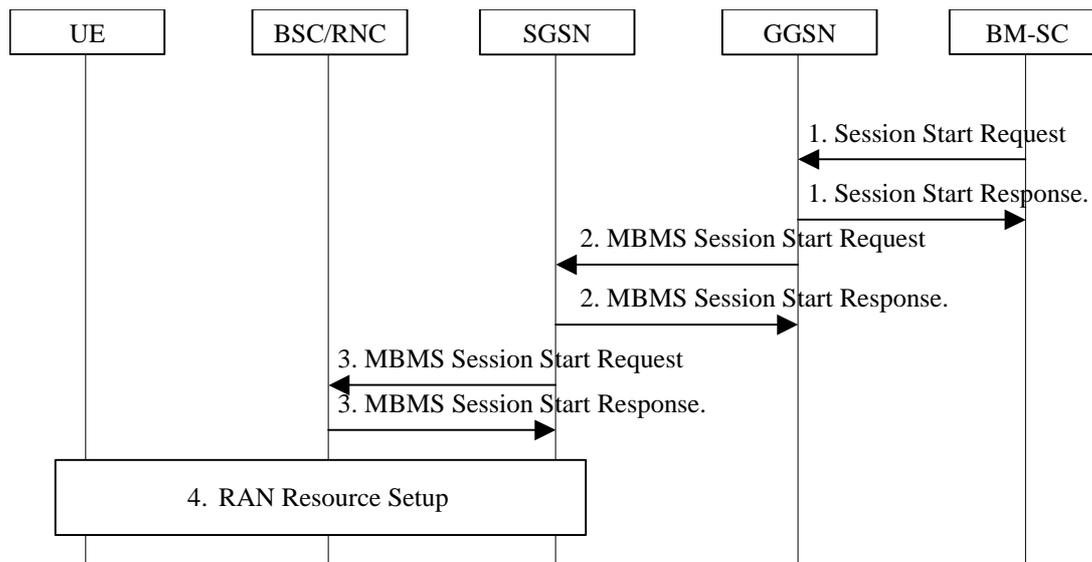


Figure 16 Session Start procedure for Broadcast MBMS Bearer Service

- 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, [estimated session duration](#)...) 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.

CR-Form-vZ

CHANGE REQUEST

⌘ **23.246 CR 057** ⌘ rev **3** ⌘ Current version: **6.2.0** ⌘

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

Title:	⌘ Removing FFS from TS 23.246		
Source:	⌘ SA2 (Vodafone, Samsung)		
Work item code:	⌘ MBMS	Date:	⌘ 21/04/2004
Category:	⌘ F	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:	⌘ Removing FFS to get MBMS stage 2 3GPP TS 23.246 stable.		
Summary of change:	⌘ The SGSN performs a subscription check for the requested MBMS bearer service identified by the IP multicast address and APN should be specified in 3GPP TS 29.061 [v] in the section 8.2 MBMS multicast service activation; Removed "tracking/non-tracking FFS" because it is no longer used for MBMS in the section 8.3 MBMS session start procedure; When MBMS registration from GGSN to BM-SC, the exact nature of the signalling between GGSN and BM-SC via Gmb interface should be specified in 29.xyz [v] in the section 8.4. Removed "tracking/non-tracking FFS" because it is no longer used for MBMS in the section 8.14 MBMS.		
Consequences if not approved:	⌘ Other groups will get confused and do unnecessary work.		

Clauses affected:	⌘ 2, 8.2; 8.3; 8.4, 8.14										
Other specs Affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Y</td> <td style="padding: 2px;">N</td> </tr> <tr> <td style="padding: 2px;"><input type="checkbox"/></td> <td style="padding: 2px;"><input checked="" type="checkbox"/></td> </tr> <tr> <td style="padding: 2px;"><input type="checkbox"/></td> <td style="padding: 2px;"><input checked="" type="checkbox"/></td> </tr> <tr> <td style="padding: 2px;"><input type="checkbox"/></td> <td style="padding: 2px;"><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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- 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.

2 References

[v] [3GPP TS 29.061: "Interworking between the Public Land Mobile Supporting Packet based Services and Packet Data Networks"](#)

(***** next modified section *****)

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.

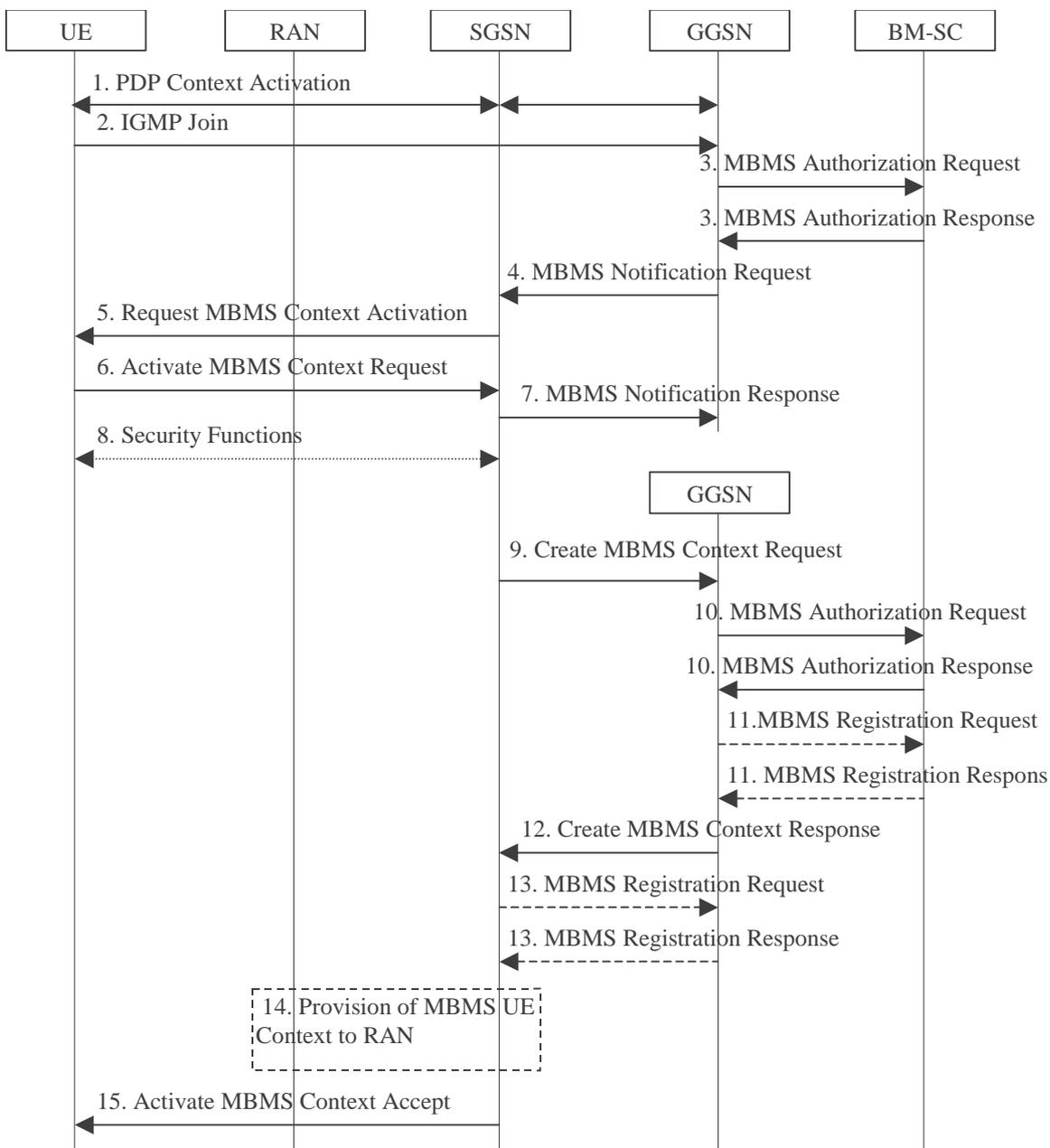


Figure 7: The activation of an MBMS multicast service

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_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.

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:

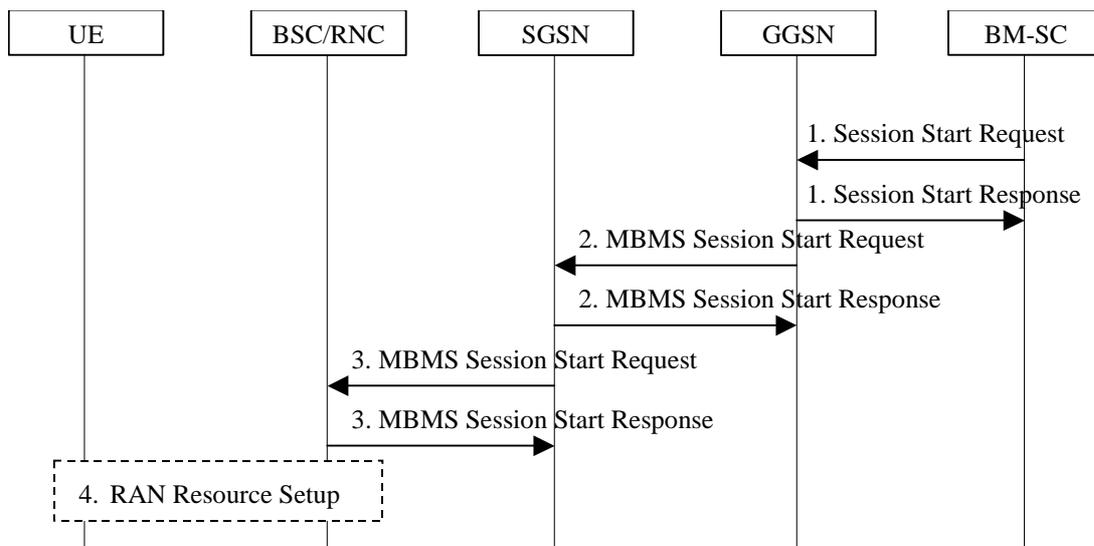


Figure 8 Session Start procedure

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.

8.4 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.

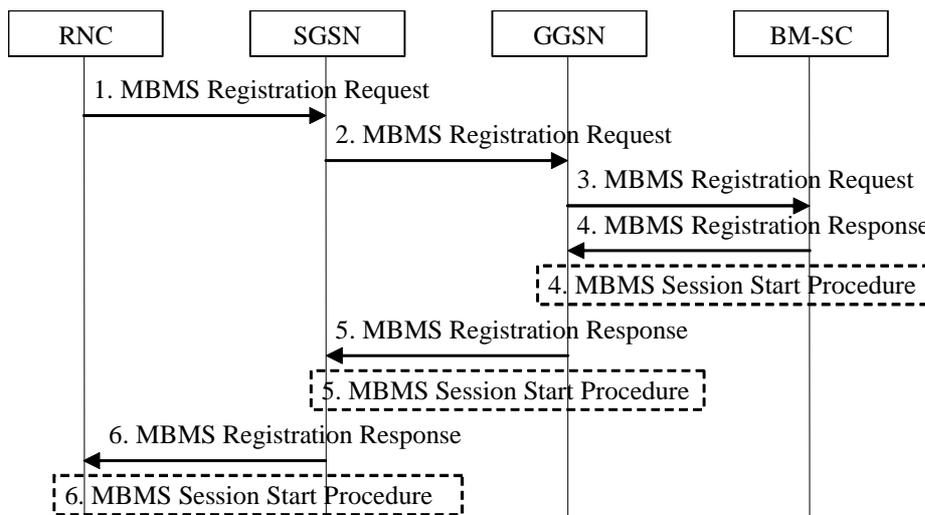


Figure 9: MBMS Registration procedure

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 [via Gmb interface is specified in 3GPP TS29.061 \[v\]](#). ~~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".

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 QoS, MBMS service Area (tracking/non-tracking area are FFS) 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:

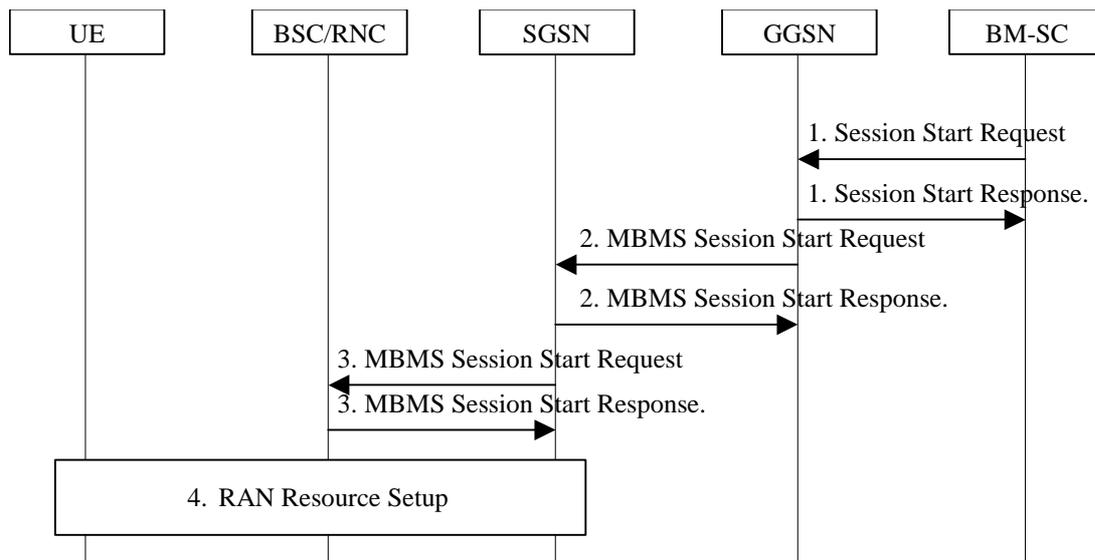


Figure 16 Session Start procedure for Broadcast MBMS Bearer Service

- 1) The BM-SC sends a Session Start Request message the impending start of the transmission and to provide the MBMS session attributes (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.

Sophia Antipolis, France, 17- 21 May 2004

CR-Form-v

CHANGE REQUEST⌘ **23.246 CR 058** ⌘ rev **3** ⌘ Current version: **6.2.0** ⌘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 on Relationship between MBMS Session Stop & MBMS De-registration & MBMS De-activation		
Source:	⌘ SA2 (Vodafone)		
Work item code:	⌘ MBMS Date: ⌘ 19/05/2004		
Category:	⌘ D Release: ⌘ Rel-6		
	<table border="0"> <tr> <td style="vertical-align: top;"> <p>Use <u>one</u> of the following categories:</p> <p>F (correction)</p> <p>A (corresponds to a correction in an earlier release)</p> <p>B (addition of feature),</p> <p>C (functional modification of feature)</p> <p>D (editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP TR 21.900.</p> </td> <td style="vertical-align: top;"> <p>Use <u>one</u> of the following releases:</p> <p>2 (GSM Phase 2)</p> <p>R96 (Release 1996)</p> <p>R97 (Release 1997)</p> <p>R98 (Release 1998)</p> <p>R99 (Release 1999)</p> <p>Rel-4 (Release 4)</p> <p>Rel-5 (Release 5)</p> <p>Rel-6 (Release 6)</p> </td> </tr> </table>	<p>Use <u>one</u> of the following categories:</p> <p>F (correction)</p> <p>A (corresponds to a correction in an earlier release)</p> <p>B (addition of feature),</p> <p>C (functional modification of feature)</p> <p>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)</p> <p>R96 (Release 1996)</p> <p>R97 (Release 1997)</p> <p>R98 (Release 1998)</p> <p>R99 (Release 1999)</p> <p>Rel-4 (Release 4)</p> <p>Rel-5 (Release 5)</p> <p>Rel-6 (Release 6)</p>
<p>Use <u>one</u> of the following categories:</p> <p>F (correction)</p> <p>A (corresponds to a correction in an earlier release)</p> <p>B (addition of feature),</p> <p>C (functional modification of feature)</p> <p>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)</p> <p>R96 (Release 1996)</p> <p>R97 (Release 1997)</p> <p>R98 (Release 1998)</p> <p>R99 (Release 1999)</p> <p>Rel-4 (Release 4)</p> <p>Rel-5 (Release 5)</p> <p>Rel-6 (Release 6)</p>		

Reason for change:	⌘ Removed detailed FFS into stage 3 specification.
Summary of change:	⌘ Removed the signalling between GGSN and BM-SC into stage 3 specification;
Consequences if not approved:	⌘ Misunderstanding may cause difficulty for RAN group's work.

Clauses affected:	⌘ 2, 8.6; 8.7												
Other specs Affected:	<table border="1"> <tr> <td>Y</td> <td>N</td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td>Other core specifications</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td>Test specifications</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td>O&M Specifications</td> </tr> </table>	Y	N		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other core specifications	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Test specifications	<input type="checkbox"/>	<input checked="" type="checkbox"/>	O&M Specifications
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Other comments:	⌘												

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2 References

[x] [3GPP TS 29.061 "Interworking between the Public Land Mobile Network \(PLMN\) Packet Data Networks \(PDN\)"](#)

**** NEXT MODIFIED SECTION ****

8.6 MBMS De-Registration Procedure

The MBMS De-Registration is the procedure by which a downstream node informs an upstream node that it does not need a 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.

The MBMS De-registration procedure is initiated:

- By the SGSN or GGSN when the last MBMS UE Context for a particular MBMS bearer service is deleted from the node and the "list of downstream nodes" parameter in the corresponding MBMS Bearer Context is empty;
- By the SGSN or GGSN when the last node registered in the "list of downstream nodes" de-registers from an MBMS bearer service for which there is no corresponding MBMS UE Context; or
- By the DRNC that registered at an SGSN when it deletes the associated MBMS Service Context.

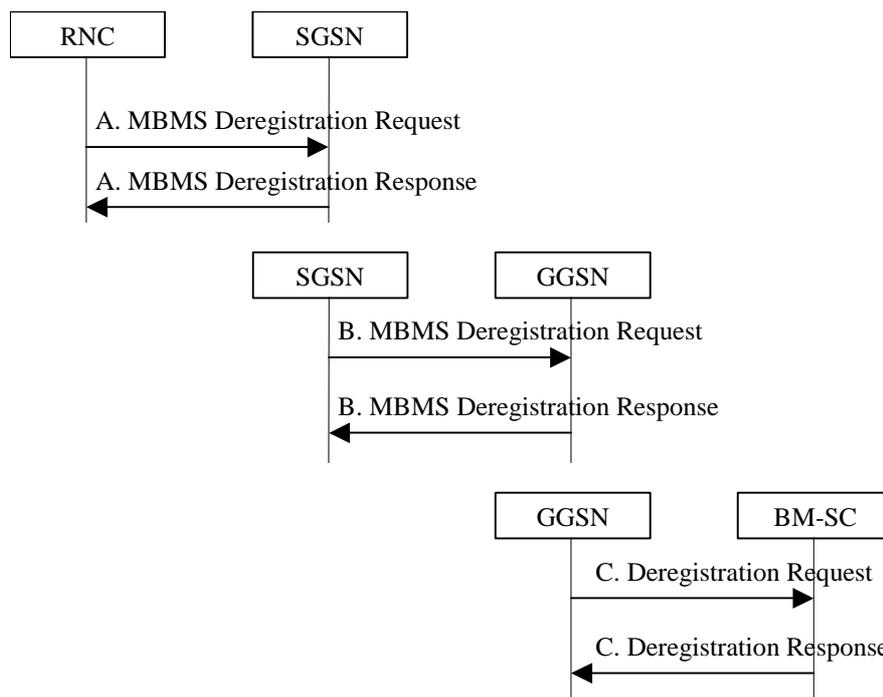


Figure 11: MBMS De-Registration Procedure

- A. When the DRNC that is registered at an SGSN no longer hosts any UE interested in that MBMS bearer service, the DRNC requests the de-registration from the MBMS bearer service to its parent SGSN. As an implementation option, the RNC may decide not to de-register from the MBMS bearer service immediately when these conditions are met, e.g. in order to avoid unnecessary signalling in the case where the RNC would again need the same MBMS bearer service shortly after.

The SGSN removes the identifier of the RNC from the "list of downstream nodes" parameter of the affected MBMS Bearer Context and confirms the operation by sending an MBMS De-Registration Response message to

the RNC. If an Iu bearer plane had been established between the RNC and the SGSN for this MBMS bearer service, the Iu bearer plane is released.

- B. When the "list of downstream nodes" of a particular MBMS Bearer Context in the SGSN becomes empty and the SGSN has no MBMS UE Contexts linked to that MBMS Bearer Context, the SGSN sends an MBMS De-Registration Request (IP multicast address, APN) message to its upstream GGSN.

The GGSN removes the identifier of the SGSN from the "list of downstream nodes" parameter of the affected MBMS Bearer Context and confirms the operation by sending an MBMS De-Registration Response message to the SGSN. If a bearer plane had been established between the SGSN and the GGSN for this MBMS bearer service, the bearer plane is released.

- C. 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 De-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.~~ If a bearer plane had been established over Gi for this MBMS bearer service, the bearer plane is released.

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 De-Registration Response message to the GGSN.

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).

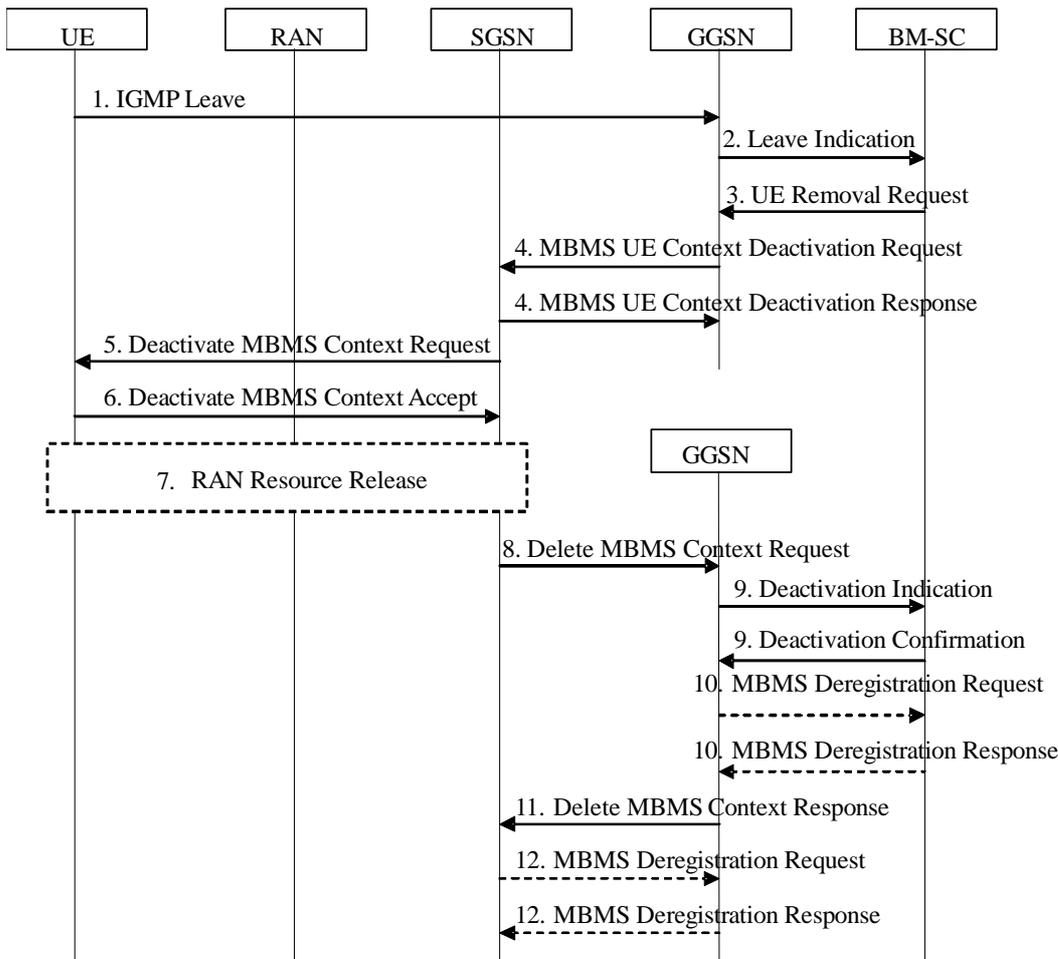


Figure 13: MBMS Multicast Service Deactivation

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~~ is specified in 3GPP 29.061[x].
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~~ is specified in 29.061 [x]. 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".

CR-Form-v7
CHANGE REQUEST
⌘ 23.246 CR 059 ⌘ rev 1 ⌘ Current version: 6.2.0 ⌘

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:	⌘	Remove some FFS on PMM-CONNECTED vs RRC-CONNECTED UEs
Source:	⌘	SA2 (Nortel Networks, Vodafone)
Work item code:	⌘	MBMS
		Date: ⌘ 18/03/2004
Category:	⌘	F
		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 .
		Release: ⌘ Rel-6 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 current TS indicates some FFS in the Notification chapter regarding whether the UEs are moved to RRC-CONNECTED or to PMM-CONNECTED mode when the Session starts. As it has been clarified in RAN groups that UEs are moved to PMM-CONNECTED state and as this was also clarified when describing the Service Request procedure for MBMS in a previous SA2 meeting, this FFS can be removed.
Summary of change:	⌘	Change text to clarify that some UEs are moved to PMM-CONNECTED mode
Consequences if not approved:	⌘	Discrepancies between SA2 and RAN2/RAN3 documentation

Clauses affected:	⌘	8.1.1				
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					
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		<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> Test 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="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> O&M Specifications	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Y	N					
<input type="checkbox"/>	<input checked="" type="checkbox"/>					
Other comments:	⌘	This CR is a follow-up to the concept, approved by SA2 at the Jan 2003 meeting.				

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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.

8.1.1 Iu mode notification (UTRAN and GERAN)

When an MBMS Session starts, UEs interested in the MBMS bearer service (PMM-CONNECTED UEs and PMM-IDLE UEs) shall be notified.

MBMS Session attributes such as Session Identifier and ~~the~~ MBMS Service Area(s) are made available in all interested RNCs during the Session Start procedure. ~~Other parameters are FFS.~~

For radio efficiency reasons, the UTRAN may select on per cell basis whether to establish point-to-point or point-to-multipoint links for the distribution of MBMS data to the UEs.

In order to perform this selection, the UTRAN requests a proportion of UEs to move to PMM-CONNECTED ~~/RRC-CONNECTED state~~mode by means of MBMS notification sent in the MBMS service Area.

~~The fact that this MBMS notification moves the UEs back to PMM-CONNECTED or to RRC-CONNECTED state is FFS, subject to RAN decision.~~

The exact number of UEs moved to PMM-CONNECTED ~~/RRC-CONNECTED state~~mode is a decision of RAN node. It is not necessary for all UEs to move to PMM-CONNECTED/mode ~~RRC-CONNECTED~~ in order for the RAN to decide to use point-to-multipoint, other UEs may remain in PMM-IDLE state. This is a UTRAN choice (based on RRM criteria...), ~~FFS in RAN group.~~

Following the decision to set up point-to-point or point-to-multipoint links, the number of UEs that need to be maintained in PMM-CONNECTED ~~state~~mode or moved to PMM-IDLE ~~state~~mode for MBMS data reception is also a decision of a RAN node.

CHANGE REQUEST

⌘ **23.246 CR 061** ⌘ rev **2** ⌘ Current version: **6.2.0** ⌘

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 MBMS De-Registration procedure		
Source:	⌘ SA2 (Samsung, Huawei, China Mobile, Vodafone)		
Work item code:	⌘ MBMS	Date:	⌘ 21/05/2004
Category:	⌘ F 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 .	Release:	⌘ Rel-6 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:	⌘ [Reason 1] During last S2 meeting (#38), the BM-SC initiated deregistration procedure was clarified to show the fact that SGSN will send different messages (session stop and deregistration) to different RNCs in case the deregistration happens during a session. This scenario has the following result when the deregistration happens during a session: 1) SGSN will send "MBMS Deregistration Request" to those RNCs which are listed in the downstream nodes→then these RNCs return a message and bearer planes between RNCs and the SGSN are released. Conclusion: there is no problem with these RNCs which are listed in the "list of downstream nodes". 2) SGSN will only send "Session Stop" to those RNCs which are not listed in the "list of downstream nodes" but have bearer planes created with SGSN→then bearer planes between these RNCs and SGSN are released. Conclusion: there is a problem in case these RNCs still have UEs in PMM-Connected state since only bearers are released, but the RNC contexts still exist. In addition, when the deregistration procedure happens out of a session, then SGSN sends the "MBMS deregistration request" to only those RNCs which are listed in the "list of downstream nodes", which is even tricky. Because some RNCs may have UEs which are in PMM-Connected mode and have PS RABs thus these RNCs still have MBMS RNC contexts, but they are not registered in the "list of downstream nodes" parameter in SGSN since they are not DRNC. Therefore, Sending two different messages from SGSN to different RNCs for deregistration purpose during a session is neither efficient nor correct, and sending the deregistration message only to RNCs listed in the "list of
---------------------------	--

downstream nodes" out of a session is incorrect. Moreover, since the "MBMS Deregistration Request" and "MBMS Deregistration Response" messages have the function of both deregistration and releasing the bearer, one couple of messages is enough and should be sent to all RNCs.

[Reason 2]
As stated in 8.6.1 of TS 23.246, the BM-SC initiated MBMS De-Registration procedure "... results in releasing of all MBMS Bearer Contexts and associated MBMS UE Contexts in the nodes along the distribution tree." The De-Registration procedure should specify this.

Summary of change: ⌘ [Change 1]
Using only one couple of messages (MBMS deregistration request and MBMS deregistration response) in lu interface for deregistration purpose, and this couple of message should be sent to all RNCs.

[Change 2]
In BM-SC initiated MBMS De-Registration procedure, descriptions that the BM-SC removes the MBMS Bearer context and that the RNC releases all MBMS UE Contexts are added.

Consequences if not approved: ⌘ BM-SC initiated deregistration procedure is neither efficient nor correct in lu interface.

Clauses affected: ⌘ 2, 8.6.1

	Y	N		⌘
Other specs affected:		X	Other core specifications	
		X	Test specifications	
		X	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.

***** First 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"
- [8] [3GPP TS 25.346: "Introduction of the Multimedia Broadcast Multicast Service \(MBMS\) in the Radio Access Network"](#)
- [9] [3GPP TS 43.246: "Technical Specification Group GSM/EDGE Radio Access Network; Multimedia Broadcast Multicast Service \(MBMS\) in the GERAN"](#)

Editors note: to be updated with TS number for SA4 user services specification.

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

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.

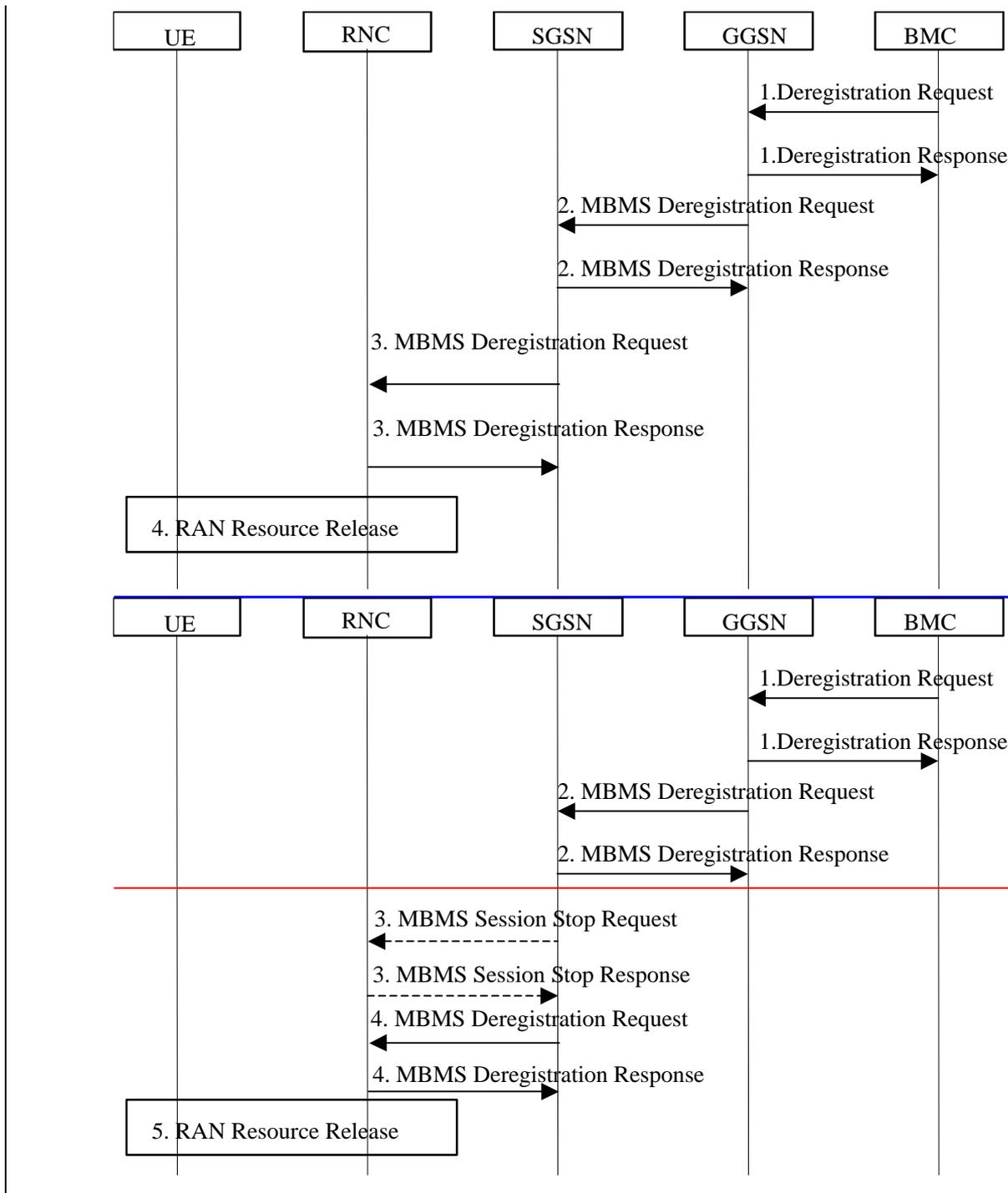


Figure 12: BM-SC initiated MBMS De-Registration Procedure

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.~~
43. The SGSN sends an MBMS De-Registration Request message to all RNCs [connected with this SGSN, 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.
54. The RNC releases the affected radio resources, [all MBMS UE Contexts](#) and the MBMS Service Context. The detailed procedures are [specified in 3GPP TSs 25.346 \[8\] and 43.246 \[9\]](#) ~~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 [specified in 3GPP TSs 25.346 \[8\] and 43.246 \[9\]](#) ~~FFS~~.

CHANGE REQUEST

⌘ **23.246 CR 062** ⌘ rev **3** ⌘ Current version: **6.2.0** ⌘

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:	⌘ New addition to MBMS bearer context	
Source:	⌘ SA2 (Samsung, Vodafone)	
Work item code:	⌘ MBMS	Date: ⌘ 21/05/2004
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:	<p>⌘ During last S2 meeting (#38), a new procedure "MBMS Session Update" was added. This procedure is used to update the list of RA information in RNC if SGSN has sent a the list of RA information to the RNC in Session Start procedure (even if the list is empty).</p> <p>In order to provide this kind of information, SGSN shall in fact track the number of UEs in each RA which are listed in the "list of RAs" as is also indicated in current spec 23.246:</p> <p><i>The SGSN may send the Session Update to a RNC when:</i></p> <ul style="list-style-type: none"> - The first UE which have activated the service enters in a RA - The last UE which have activated the service leaves from a RA <p>Without tracking the number of UEs in each RA listed in "the list of RAs", SGSN can not know the information like "the last UE leaves the RA".</p> <p>Therefore a new parameter "List of Number of UEs per RA" is necessary.</p> <p>In addition, RNC should have a new parameter similarly to store the list of RA information (but without the number of UEs).</p>
Summary of change:	<p>⌘ Adding a new parameter "List of Number of UEs per RA" in the MBMS bearer context for SGSN, and a new parameter "List of RAs" in the MBMS bearer context for RNC. Some FFSs are deleted.</p>

Consequences if not approved: ☼ Both SGSN and RNC cannot realize the function of updating a list of RA information in the RNC.

Clauses affected: ☼ 6.2

	Y	N		☼
Other specs affected:		X	Other core specifications	
		X	Test specifications	
		X	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.

***** Start of change*****

6.2 MBMS Bearer Context

The MBMS Bearer Context, which is referred to as MBMS Service Context in RAN, contains all information describing a particular MBMS bearer service and is created in each node involved in the delivery of the MBMS data.

An MBMS Bearer Context is created in the SGSN and GGSN when the first MBMS UE Context is created in the node or when a downstream node requests it. The MBMS Bearer Context is statically configured in the BM-SC; how this is done is out of the scope of this specification. The MBMS Bearer Context is created in the BSC/SRNC when a first MBMS UE Context is created in BSC/SRNC. Session Start procedure may create MBMS Bearer Context in a BSC/RNC which has no MBMS Bearer Context yet. ~~Furthermore, it is FFS whether the state model described below is applicable as such to the RAN or whether it needs to be extended to cover the case of the RAN properly.~~

An MBMS Bearer Context, once created, can be in one of two states reflecting the bearer plane resource status of the corresponding MBMS bearer service.

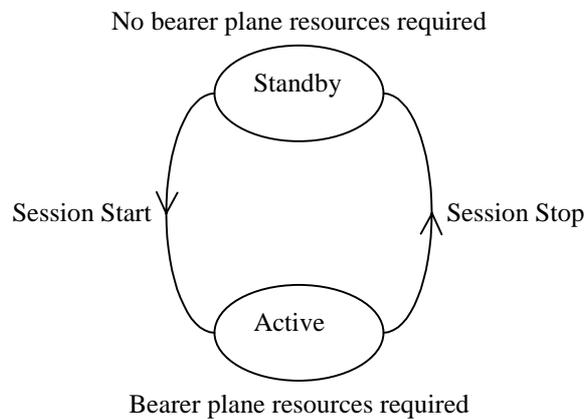


Figure 6: MBMS Bearer Context State Model

'Active' reflects the state of an MBMS Bearer Context in which bearer plane resources are required in the network for the transfer of MBMS data. This state is maintained as long as there is a corresponding MBMS session ongoing.

'Standby' reflects the state of an MBMS Bearer Context in which no bearer plane resources are required in the network for the transfer of MBMS data. This state is maintained as long as there is no corresponding MBMS session ongoing.

The content of the MBMS Bearer Context is described in Table 2.

Table 2: MBMS Bearer Context

Parameter	Description	RAN	SGSN	GGSN	BM-SC
IP multicast address	IP multicast address identifying the MBMS bearer described by this MBMS Bearer Context.	X	X	X	X
APN	Access Point Name on which this IP multicast address is defined.	X	X	X	X FFS
TMGI	Temporary Mobile Group Identity allocated to the MBMS bearer service.	X	X	X	X
State	State of bearer plane resources ('standby' or 'active')	X FFS	X	X	X
Required MBMS Bearer Capabilities	Minimum bearer capabilities the UE needs to support		X	X	X
QoS	Quality of Service required for the MBMS bearer service.	X	X	X	X
MBMS Service Area	Area over which the MBMS bearer service has to be distributed.	X	X	X	X
List of downstream nodes	List of downstream nodes that have requested the MBMS bearer service and to which notifications and MBMS data have to be forwarded.		X	X	X
Number of UEs ¹⁾ (FFS)	Number of UEs hosted by the node that have joined the multicast MBMS bearer service.	FFS	X	X	FFS
List of number of PMM-IDLE UEs per RA	List of number of PMM-IDLE UEs for each RA, which contains at least one UE that has joined the MBMS service.		X ¹⁾		
List of RAs	List of RAs, each of which contains at least one UE that has joined the MBMS service.	X ¹⁾			

~~Editor's note 1:— Number of UEs may be used to determine when the last UE leaves the node and/or for content-provider charging. The RAN knows how many UEs in RRC CONNECTED mode are interested in a multicast service, however it does not know how many UEs in RRC IDLE mode are interested in the service, hence the meaning and relevance of this parameter for the RAN are FFS.~~

Note 1: It is an optional parameter. 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.

Sophia Antipolis, France, 17- 21 May 2004

CR-Form-v
CHANGE REQUEST
⌘ 23.246 CR 066 ⌘ rev 2 ⌘ Current version: 6.2.0 ⌘

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:	⌘	CR for MBMS UE Context in Section 6.1
Source:	⌘	SA2 (Vodafone)
Work item code:	⌘	MBMS
	Date:	⌘ 19/05/2004
Category:	⌘	F
		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 .
	Release:	⌘ Rel-6
		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 BM-SC does seem to need to have a UE context, eg, the BM-SC will know the UE capability such as QoS at the time.
Summary of change:	⌘	The related parameters for BM-SC were added in the Table 1: MBMS UE Context.
Consequences if not approved:	⌘	Other groups will get confused and some work will be missing.

Clauses affected:	⌘	6.1				
Other specs Affected:	⌘	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="padding: 2px;">Y</td> <td style="padding: 2px;">N</td> </tr> <tr> <td style="padding: 2px;"><input type="checkbox"/></td> <td style="padding: 2px;"><input checked="" type="checkbox"/></td> </tr> </table> Other core specifications ⌘	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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<input type="checkbox"/>	<input checked="" type="checkbox"/>					
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		<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="padding: 2px;"><input type="checkbox"/></td> <td style="padding: 2px;"><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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- 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.

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 ~~and~~ BM-SC 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 lu 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	lu - X Gb - FFS	X FFS
APN	Access Point Name on which this IP multicast address is defined.	X	X	X	X	lu - X Gb - FFS	X
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	X
TI	Transaction Identifier	X	X				
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.

CR-Form-v7	
CHANGE REQUEST	
⌘ 23.246 CR 069 ⌘ rev 1 ⌘	Current version: 6.2.0 ⌘

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:	⌘ Removing Security requirements from 23.246		
Source:	⌘ SA2 (Ericsson)		
Work item code:	⌘ MBMS	Date:	⌘ 09/04/2004
Category:	⌘ F	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:	⌘ MBMS TS includes security requirements that are under the remit of SA3. SA3 has confirmed in LS S2-042149 that they will include the security requirements in the SA3 specification.
Summary of change:	⌘ Removing the security requirements from the TS.
Consequences if not approved:	⌘ Possible misalignment of security requirements between SA2 and SA3.

Clauses affected:	⌘ 5.1.1										
Other specs Affected:	<table border="1" style="font-size: x-small;"> <tr> <td style="padding: 2px;">Y</td> <td style="padding: 2px;">N</td> </tr> <tr> <td style="padding: 2px;">X</td> <td style="padding: 2px;"></td> </tr> <tr> <td style="padding: 2px;"></td> <td style="padding: 2px;">X</td> </tr> <tr> <td style="padding: 2px;"></td> <td style="padding: 2px;">X</td> </tr> </table>	Y	N	X			X		X	Other core specifications	⌘ 33.246
	Y	N									
	X										
	X										
	X										
		Test specifications									
		O&M Specifications									
Other comments:	⌘										

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- 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.

<< Changed section >>

5.1.1 Content Provider ~~Authentication, Authorization and~~ Charging

~~The BM-SC shall be able to authenticate 3rd party content providers, providing content for MBMS transmissions.~~

~~3rd party content providers may wish to initiate an MBMS transmission. In such cases, the BM-SC shall be able to authorize content providers to transmit data over MBMS bearer services depending on operator policy.~~

~~The BM-SC shall be able to verify the integrity of data received from content providers.~~

The BM-SC shall be able to generate charging records for content provider transmitted data.

CR-Form-v7

CHANGE REQUEST

⌘ **23.246 CR 077** ⌘ rev **2** ⌘ Current version: **6.2.0** ⌘

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:	⌘ Proposed flow based charging for MBMS		
Source:	⌘ SA2 (Vodafone)		
Work item code:	⌘ MBMS	Date:	⌘ 21/05/2004
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:	⌘ The existing reference architecture model in section 4.2 was proposed 2 or 3 years ago when CAMEL was planned to be used for PS domain pre-pay (on-line) charging. Since then, PS domain pre-pay charging has moved towards GGSN based techniques. More specifically, Flow based charging specification 23.125v6.0.0 is available in R'6. From the architecture point of view, there are no new interfaces introduced by this proposal.
Summary of change:	⌘ Added reference to TS 23.125. Removal of CSE from the MBMS architecture. Included bearer and application level charging for MBMS
Consequences if not approved:	⌘ Lack of clarity regarding MBMS bearer charging.

Clauses affected:	⌘ 2; 4.2; 5.7.1 ; 10; and new sections 10.1, 10.2 and 10.3						
Other specs Affected:	<table border="1"> <tr> <td>Y</td> <td>N</td> </tr> <tr> <td><input type="checkbox"/></td> <td><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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Below is a brief summary:

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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.

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*.

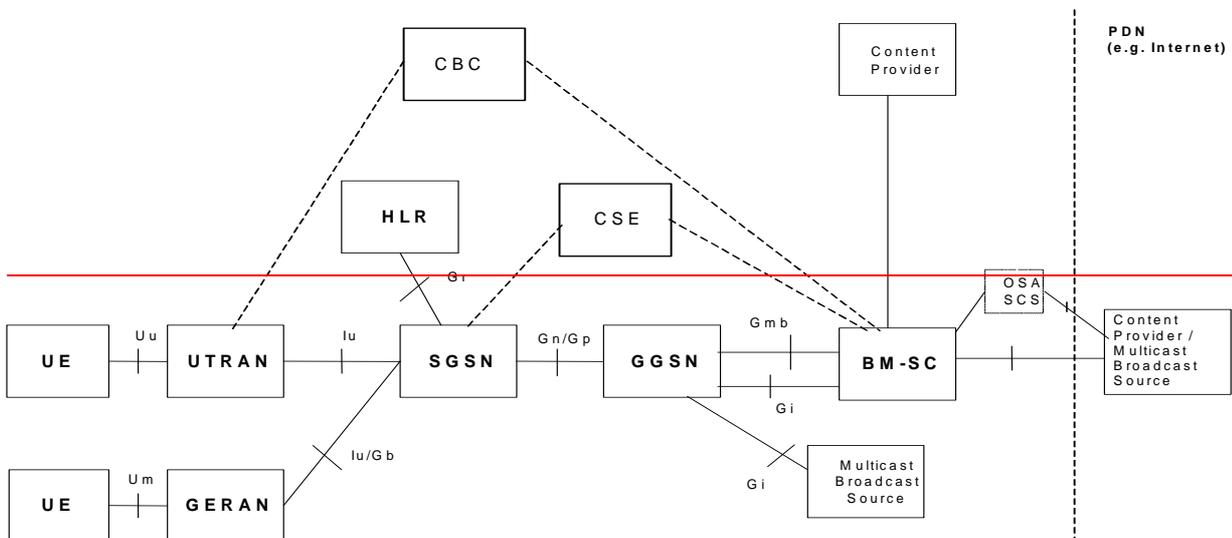
- [1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 22.146: "Multimedia Broadcast/Multicast Service; Stage 1".
- [3] 3GPP TS 23.107: "Quality of Service (QoS) concept and architecture".
- [4] 3GPP TS 29.061: "Interworking between the Public Land Mobile Network (PLMN) supporting 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"

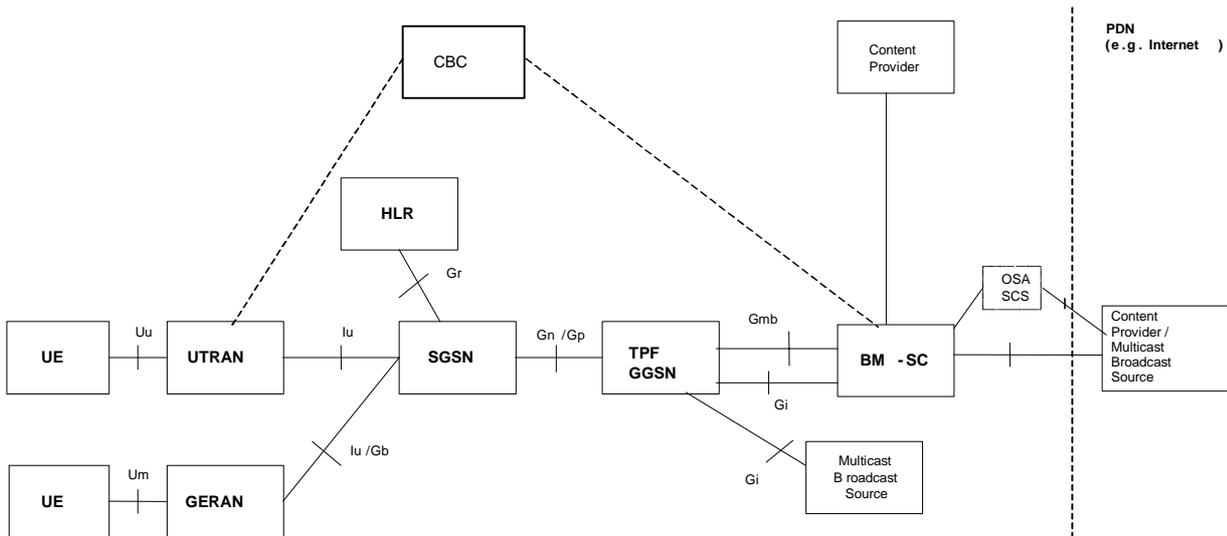
Editors note: to be updated with TS number for SA4 user services specification.

[\[x\]](#) 3GPP TS 23.125: "Flow Based Charging"

*****Next modified section*****

4.2 Reference Architecture Model





Note: dotted lines means functions / reference points that are FFS. Gp applies only when SGSN and GGSN are in different PLMN

Figure 1: Reference architecture to support MBMS

*****Next modified section*****

5.7 Optional Functional Element

NOTE: The following are FFS.

~~5.7.1 CSE~~ 5.7.1 Void

~~The SGSN may use CAMEL to handle pre-paid services, e.g. credit checking for on-line charging.~~

5.7.2 CBC

The Cell Broadcast Centre (CBC) may be used to announce MBMS user services to the users.

5.7.3 OSA-SCS

The BM-SC might use OSA-SCS to interact with third parties.

***** next modified section *****

10 Charging requirement

10.1 General

MBMS architecture shall support on-line and off-line charging.

It shall be possible to collect charging information for the multicast mode. It shall also be possible to collect charging information for MBMS services in visited networks.

MBMS shall collect charging information about the transmission of MBMS broadcast or multicast data that are provided by content or service providers (e.g. 3rd parties). This shall enable billing of broadcast and multicast content or service providers.

To enable billing of broadcast and multicast content providers, data shall be collected at the BM-SC.

NOTE: SGSN, GGSN and BM-SC generate charging data for the transmitted data, always under the assumption that the UEs are within the MBMS service area. If the MBMS service area is less than the PLMN, then there is the possibility that a UE will have moved outside the MBMS service area. Charging data will still be generated for that UE causing an inaccuracy in the data. This inaccuracy increases as the size of the MBMS service area is decreased.

10.2 Bearer level charging for MBMS

To provide bearer level charging for MBMS, mechanisms and functional elements described in TS 23.125 [x] are used. In case the BM-SC intends to provide input for bearer level charging, it acts as an Application Function (AF) from the perspective of the flow-based bearer charging architecture (see TS 23.125).

NOTE-i: It is expected that bearer level charging is used to zero-rate MBMS traffic.

NOTE-ii: It is expected that the flow filters for MBMS are statically configured in the TPF, hence BM-SC input is not required for bearer level charging.

10.3 Application level charging for MBMS

The architecture for providing application level charging for MBMS is FFS.

CR-Form-v7
CHANGE REQUEST
⌘ 23.246 CR 078 ⌘ rev 1 ⌘ Current version: 6.2.0 ⌘

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:	⌘ Notification of Incoming CS Domain Call/PS Data/Additional MBMS Call during An Ongoing MBMS Session for GERAN		
Source:	⌘ SA2 (Vodafone UK)		
Work item code:	⌘ MBMS	Date:	⌘ 10/05/2004
Category:	⌘ F	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 for the notification of incoming CS domain call/PS data/additional MBMS call during an ongoing MBMS session in GERAN. For incoming CS domain call, CS domain paging does not indicate the identity of the caller to the UE; In addition, CS domain paging used for services rather than voice calls, such as MT SMS, USSD, etc. Further more, if the mobile responds to the CS paging in GERAN, then the MBMS user data flow is likely to be interrupted. For secondary PS domain call, UE is needed to monitor its paging channels while receiving the MBMS session's user data.
Summary of change:	⌘ Text on notification in case of parallel services for GERAN is added in section .
Consequences if not approved:	⌘ Stage 1 requirements not met.

Clauses affected:	⌘ The section 8.17 is modified.
--------------------------	---------------------------------

Other specs Affected:		Y	N		
	⌘	X		Other core specifications	⌘ GERAN stage 3 43.246
			X	Test specifications	
			X	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.

8.17 Notification in case of parallel services

8.17.1 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.

In GERAN, this is achieved by the UE monitoring its paging channels while receiving the MBMS session's user data. If the mobile responds to the CS paging in GERAN, then the ongoing MBMS service is likely to be interrupted in the UE.

8.17.2 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.

In GERAN, this is achieved by the UE monitoring its paging channel(s) where notification is sent while receiving the MBMS session's user data.

If the mobile accepts the new MBMS session in GERAN, then the ongoing MBMS service is likely to be interrupted in the UE.

8.17.3 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.

In GERAN, this is achieved by the UE monitoring its paging channels while receiving the MBMS session's user data.

If the mobile responds to the PS paging in GERAN, then the ongoing MBMS service is likely to be interrupted in the UE.

8.17.4 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 ~~BSCRNC~~ to notify the UE when MBMS session starts.

CR-Form-v7	
CHANGE REQUEST	
⌘ 23.246 CR 083 ⌘ rev 2 ⌘	Current version: 6.2.0 ⌘

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 subscription		
Source:	⌘ SA2 (Ericsson)		
Work item code:	⌘ MBMS	Date:	⌘ 21/05/2004
Category:	⌘ F	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:	⌘ Unclear where in CN the MBMS subscription information resides
Summary of change:	⌘ Clarification that subscription data resides in BM-SC.
Consequences if not approved:	⌘ Remaining contradictions in specification.

Clauses affected:	⌘ 4.4.1.1, 8.2						
Other specs affected:	<table border="1" style="font-size: x-small;"> <tr> <td style="width: 20px;">Y</td> <td style="width: 20px;">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:	⌘ The first sentence in step 9 which is related to this CR, is removed by CR 57						

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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 Modification

4.4.1.1 Subscription

Establishes the relationship between the user and the service provider, which allows the user to receive the related MBMS multicast service.

Service Subscription is the agreement of a user to receive service(s) offered by the operator. Subscription information is recorded in the ~~appropriate database(s) in the operator's network~~ [BM-SC. Subscription information and other BM-SC functionality may be on separate entities, which is enabled by proxy capability of the Gmb interface.](#)

[Note: procedures for the subscription phase are out of scope of this specification.](#)

Next Modification

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.

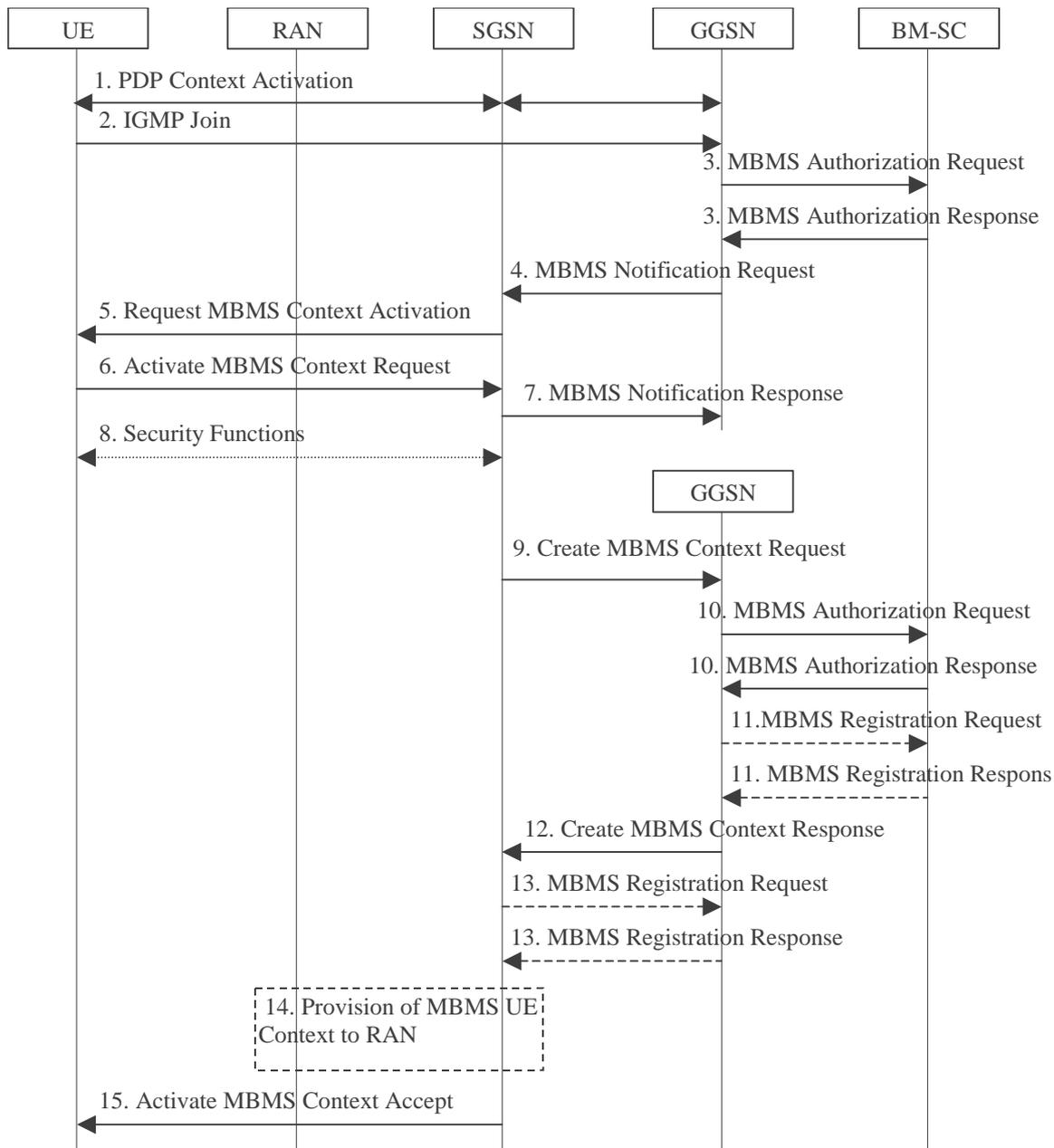


Figure 7: The activation of an MBMS multicast service

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, which may be based on subscription data in the BM-SC, 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_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.

End of Modifications
