

**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 #25.

S2 doc #	Title	Spec	CR #	cat	Versi on in	Rel	WI	S2 meeting	Clauses affected
<a href="#">S2-042853</a>	MBMS Service Area definition	23.246	076r2	F	6.3.0	6	MBMS	S2 #41	3.1
<a href="#">S2-042838</a>	Use Correct SA4 MBMS User Service Specification	23.246	084r1	D	6.3.0	6	MBMS	S2 #41	2, 4.4.1.2
<a href="#">S2-042854</a>	Clarification of BM-SC create MBMS UE Context	23.246	085r1	F	6.3.0	6	MBMS	S2 #41	8.2
<a href="#">S2-042856</a>	Remove SDU FFS in section 6.3 Quality of Service	23.246	089r1	F	6.3.0	6	MBMS	S2 #41	6.3
<a href="#">S2-042927</a>	Application Level Charging Mechanisms	23.246	093r2	F	6.3.0	6	MBMS	S2 #41	8.2, 8.10, 10.3
<a href="#">S2-042835</a>	MBMS Session Notification	23.246	094r1	F	6.3.0	6	MBMS	S2 #41	8.17
<a href="#">S2-042689</a>	Removing FFS from TS 23.246	23.246	095	F	6.3.0	6	MBMS	S2 #41	8.14
<a href="#">S2-042717</a>	Clarification of reference model	23.246	097	F	6.3.0	6	MBMS	S2 #41	4.2
<a href="#">S2-042928</a>	Service Context creation in RNC	23.246	099r2	F	6.3.0	6	MBMS	S2 #41	8.3
<a href="#">S2-042757</a>	Correction for error handling in MBMS multicast activation	23.246	101	F	6.3.0	6	MBMS	S2 #41	8.2
<a href="#">S2-042836</a>	MBMS BSC UE context and bearer plane	23.246	103r1	F	6.3.0	6	MBMS	S2 #41	6.1, 6.2, 8.2, 8.3, 8.14
<a href="#">S2-042923</a>	Allocation and retention priority for MBMS bearers	23.246	106r2	F	6.3.0	6	MBMS	S2 #41	8.2
<a href="#">S2-042960</a>	Merged CR 88 Separate Rendering of 2G and 3G Content for the Same Service, CR 90 Definition of Session Identity and CR92 Additional information needed in section 8.3 Session Start Message	23.246	107r1	F	6.3.0	6	MBMS	S2 #41	5.1.3, 5.1.5 (new clause), 8.3

## CHANGE REQUEST

23.246 CR 076 rev 2 Current version: 6.3.0

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


<b>Title:</b>	MBMS Service Area definition		
<b>Source:</b>	SA2 (Huawei, China Mobile)		
<b>Work item code:</b>	MBMS	<b>Date:</b>	18/08/2004
<b>Category:</b>	F	<b>Release:</b>	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 <a href="#">TR 21.900</a> .		Use <u>one</u> of the following releases: Ph2 (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) Rel-7 (Release 7)

<b>Reason for change:</b>	In the current TS 23.246, the MBMS Service Area is described as "The area in which a specific MBMS Bearer Service is available. It is defined individually per MBMS Bearer Service."  However, the session attribute of MBMS Service Area is provided to the downstream nodes in each Session Start procedure. Therefore, the MBMS Service Area is defined individually for MBMS Bearer Sessions.
<b>Summary of change:</b>	Redefined the MBMS Service Area and added an explanation of how this MBMS Service Area is different than the one defined in TS 22.146.
<b>Consequences if not approved:</b>	The definition of MBMS Service Area in TS 23.246 is incorrect.

<b>Clauses affected:</b>	3.1										
<b>Other specs affected:</b>	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px;">Y</td> <td style="width: 20px;">N</td> </tr> <tr> <td style="text-align: center;">X</td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;">X</td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;">X</td> <td style="text-align: center;">X</td> </tr> </table> Other core specifications Test specifications O&M Specifications	Y	N	X	X	X	X	X	X		
Y	N										
X	X										
X	X										
X	X										
<b>Other comments:</b>											

**How to create CRs using this form:**

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

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

\*\*\*\*\* First Change \*\*\*\*\*

## 3.1 Definitions

For the purposes of the present document, the terms and definitions defined in 3GPP 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 within which data of a specific MBMS ~~Bearer Service is available~~ session are sent. ~~It is defined~~ Each individually ~~per~~ MBMS ~~Bearer Service~~ session of an MBMS Bearer Service may be sent to a different MBMS Service Area. This MBMS Service Area is the same or a subset of the MBMS Service Area as defined in 3GPP TS 22.146 [2]. An MBMS Service Area smaller than the MBMS Service Area as defined in 3GPP TS 22.146 [2] is typically used for localized services.

\*\*\*\*\* End Change \*\*\*\*\*

CR-Form-v7

## CHANGE REQUEST

⌘ **23.246** CR **084** ⌘ rev **1** ⌘ Current version: **6.3.0** ⌘

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

<b>Title:</b>	⌘ Use Correct SA4 MBMS User Service Specification		
<b>Source:</b>	⌘ SA2 (Motorola)		
<b>Work item code:</b>	⌘ MBMS	<b>Date:</b>	⌘ 17/08/2004
<b>Category:</b>	⌘ <b>D</b>	<b>Release:</b>	⌘ Rel-6
	Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		Use <u>one</u> of the following releases: <b>2</b> (GSM Phase 2) <b>R96</b> (Release 1996) <b>R97</b> (Release 1997) <b>R98</b> (Release 1998) <b>R99</b> (Release 1999) <b>Rel-4</b> (Release 4) <b>Rel-5</b> (Release 5) <b>Rel-6</b> (Release 6)

<b>Reason for change:</b>	⌘ In the TS 23.246 v6.3.0, there is incomplete reference of SA4 MBMS User Service specification.
<b>Summary of change:</b>	⌘ This CR corrects the incomplete references.
<b>Consequences if not approved:</b>	⌘ The incorrect references may cause confusion when reading TS 23.246.

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

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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 ~~xx26.yyy346~~: "MBMS: [Protocols and Codecs](#) ~~user services~~"
- ~~Editors note: to be updated with TS number for SA4 user services specification.~~
- [8] void
- [9] void
- [10] 3GPP TS 25.346: "Introduction of the Multimedia Broadcast Multicast Service (MBMS) in the Radio Access Network"
- [11] 3GPP TS 43.246: "Technical Specification Group GSM/EDGE Radio Access Network; Multimedia Broadcast Multicast Service (MBMS) in the GERAN"
- [12] 3GPP TS 23.125: "Flow Based Charging"

\*\*\*\*\***Second Change**\*\*\*\*\*

### 4.4.1.2 Service announcement

MBMS user service announcement/discovery mechanisms shall allow users to request or be informed about the range of MBMS user services available. This includes operator specific MBMS user services as well as services from content providers outside of the PLMN. Service announcement is used to distribute to users information about the service, parameters required for service activation (e.g. IP multicast address) and possibly other service related parameters (e.g. service start time).

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

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

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

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

Service announcement is further defined within MBMS User Service specifications 3GPP TS ~~xx26.yy~~346 [7].

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



CR-Form-v7.1

## CHANGE REQUEST

⌘ **23.246** CR **085** ⌘ rev **1** ⌘ Current version: **6.3.0** ⌘

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

<b>Title:</b>	⌘ Clarification of BM-SC create MBMS UE Context		
<b>Source:</b>	⌘ SA2 (Huawei, China Mobile)		
<b>Work item code:</b>	⌘ MBMS	<b>Date:</b>	⌘ 18/08/2004
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b>	⌘ Rel-6
	Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		Use <u>one</u> of the following releases: <b>Ph2</b> (GSM Phase 2) <b>R96</b> (Release 1996) <b>R97</b> (Release 1997) <b>R98</b> (Release 1998) <b>R99</b> (Release 1999) <b>Rel-4</b> (Release 4) <b>Rel-5</b> (Release 5) <b>Rel-6</b> (Release 6) <b>Rel-7</b> (Release 7)

<b>Reason for change:</b>	⌘ The deactivation of UE in BM-SC is defined in MBMS Multicast Service Deactivation procedure. However, when the UE context is created in BM-SC is not specified in current TS.
<b>Summary of change:</b>	⌘ Add the creation of MBMS UE Context in the BM-SC during MBMS Multicast Service Activation procedure.
<b>Consequences if not approved:</b>	⌘ How and when to create the MBMS UE Context in the BM-SC is unclear.

<b>Clauses affected:</b>	⌘ 8.2						
<b>Other specs affected:</b>	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px;">Y</td> <td style="width: 20px;">N</td> </tr> <tr> <td style="text-align: center;">⌘</td> <td style="text-align: center;">X</td> </tr> </table> Other core specifications	Y	N	⌘	X	⌘	
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X							
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X							
<b>Other comments:</b>	⌘						

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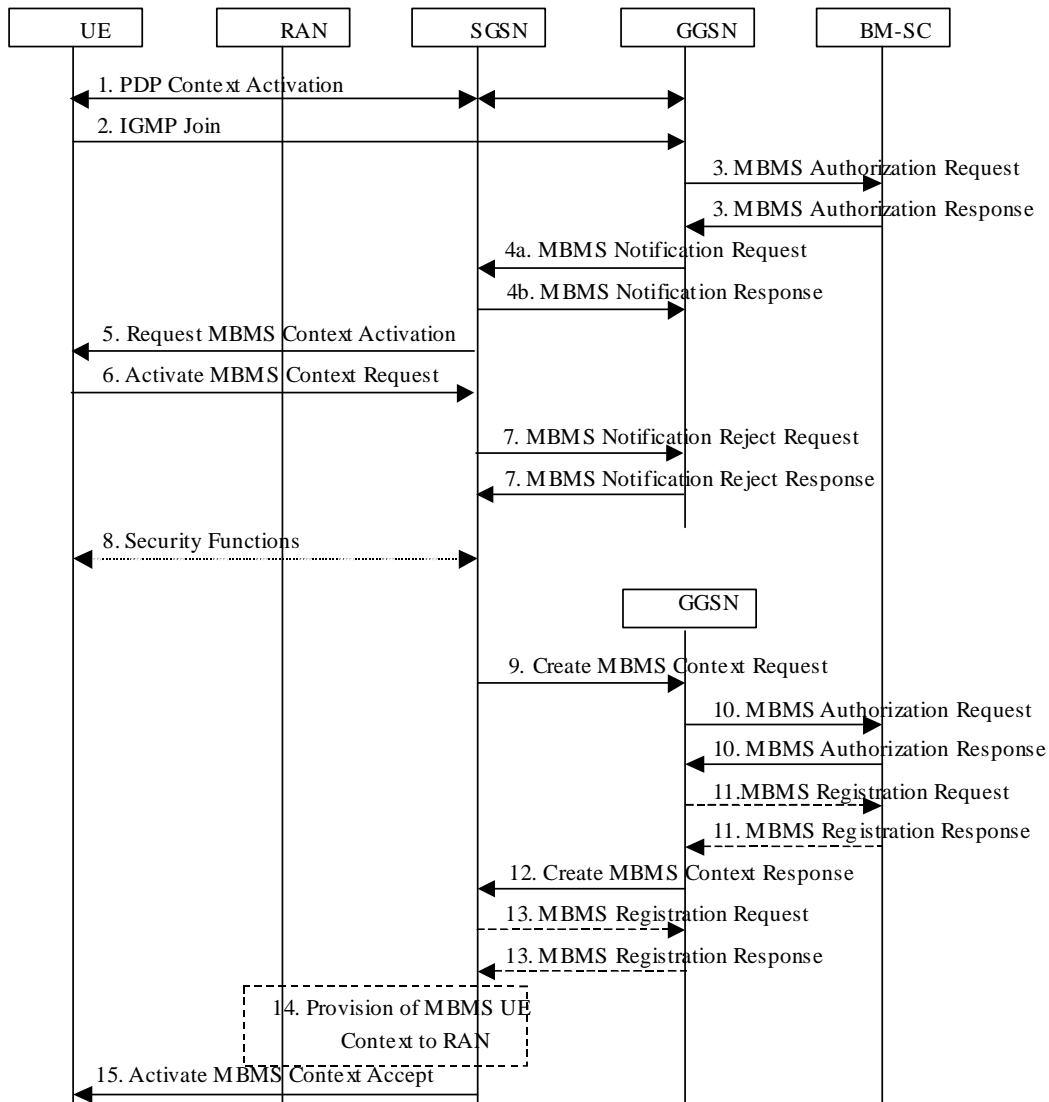
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\*\*\*\*\* First Change \*\*\*\*\*

## 8.2 MBMS Multicast Service Activation

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



**Figure 7: The activation of an MBMS multicast service**

1. The UE activates a default, typically best-effort PDP context if not already established. This can be a PDP context used for basic IP services like WAP or Internet access, or it might be the signalling PDP context used for IMS access.
2. The UE sends an IGMP (IPv4) or MLD (IPv6) Join message over the default PDP context to signal its interest in receiving a particular multicast MBMS bearer service identified by an IP multicast address.
3. The GGSN sends an MBMS Authorization Request seeking authorization for the activating UE to receive data. The authorization decision, 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.

- 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, 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. 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.
8. Security Functions may be performed, e.g. to authenticate the UE.
9. 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. [The BM-SC creates an MBMS UE Context.](#)
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 **089** rev **1** Current version: **6.3.0**

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

<b>Title:</b>	Remove SDU FFS in section 6.3 Quality of Service		
<b>Source:</b>	SA2 (Vodafone)		
<b>Work item code:</b>	MBMS	<b>Date:</b>	06/08/2004
<b>Category:</b>	<b>F</b>	<b>Release:</b>	Rel-6
Use <i>one</i> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		Use <i>one</i> of the following releases: <b>2</b> (GSM Phase 2) <b>R96</b> (Release 1996) <b>R97</b> (Release 1997) <b>R98</b> (Release 1998) <b>R99</b> (Release 1999) <b>Rel-4</b> (Release 4) <b>Rel-5</b> (Release 5) <b>Rel-6</b> (Release 6)	

<b>Reason for change:</b>	In section 6.3, it was mentioned that actual values for SDU is FFS. In fact, the actual values are dependent on the type of media.  Therefore, an indication of percentage correction is required at application layer.
<b>Summary of change:</b>	A FFS in SDU was removed and actual context was added in SDU.
<b>Consequences if not approved:</b>	It causes confusion for stage 3 implementation.

<b>Clauses affected:</b>	6.3						
<b>Other specs Affected:</b>	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table> Other core specifications	Y	N	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
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	<input checked="" type="checkbox"/>	Test specifications					
	<input checked="" type="checkbox"/>	O&M Specifications					
<b>Other comments:</b>							

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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.

\*\*\*\*\* 1stmodification \*\*\*\*\*

## 6.3 Quality-of-Service

It shall be possible for the network to control quality-of-service parameters for sessions of multicast and broadcast MBMS bearer services. All QoS attributes [related to the UMTS bearer service](#) described in 3GPP TS 23.107 [3] are applicable to MBMS bearer services. Compared to point-to-point bearer services the following limitations exist:

- For **traffic class**, only the background and streaming classes shall be supported.
- For **SDU error ratio**, only higher values are supported, i.e. the values describing higher numbers of lost or corrupted SDUs (actual values [for the background and streaming classes are  \$10^{-2}\$  and  \$10^{-1}\$](#)  ~~FFS~~).
- For **maximum bit-rate**, see the values described in [3GPP TS 22.246](#).

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

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

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

MBMS user services that would normally use MBMS bearer services of background class may however need to use a streaming class MBMS bearer service. This will reduce packet loss due to congestion, since a minimum bit-rate is guaranteed. Otherwise the MBMS user service will have to provide sufficient redundancy within the data to be able to cope with the high packet loss.

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

CR-Form-v7

## CHANGE REQUEST

**23.246** CR **093** rev **2** Current version: **6.3.0**

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

<b>Title:</b>	Application Level Charging Mechanisms		
<b>Source:</b>	SA2 (Vodafone)		
<b>Work item code:</b>	MBMS	<b>Date:</b>	20/08/2004
<b>Category:</b>	F	<b>Release:</b>	Rel-6
	<p>Use <u>one</u> of the following categories:</p> <p><b>F</b> (correction)</p> <p><b>A</b> (corresponds to a correction in an earlier release)</p> <p><b>B</b> (addition of feature),</p> <p><b>C</b> (functional modification of feature)</p> <p><b>D</b> (editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a>.</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:** According to stage 1 22.146 and 22.246 charging requirements, there are four key charging aspects need to be supported by MBMS architecture, i.e. service subscription based charging, subscriber roaming charging, key associated with the event of content and time duration charging aspects.

The above four charging requirements are mapped into the following elements which need to be supported in MBMS architecture:

- a) Service subscription charging requirement applies that an **element of monthly fee for a service registration** in CDR should be generated in BM-SC;
- b) Subscriber roaming charging requirement applies that the **MSISDN and MCC & MNC** should be passed to BM-SC, i.e. the MCC & MNC of SGSN about the MSISDN under roaming case should be passed to home GGSN and then passed to BM-SC via GTP tunnel. The detailed procedures are included in the CR. Also, the BM-SC needs to pass the roaming information along with other information (FFS) to the pre-paid system via Ro interface.
- c) Decryption Key for accessing data charging requirement applies that a **key** associated with the **event** of content should be generated in the BM-SC, i.e. the **event** associated with the content should be one element of the CDR.
- d) **Time duration** based charging element should be generated in BM-SC's CDR (e.g. the time duration for streaming service can be accounted from MBMS session start to MBMS session stop). But when network initiates PDP context deactivation, mobile should be forced not to receive MBMS at the radio layer anymore.



In summary, in order to support all MBMS charging requirements, the number of elements listed above should be included in BM-SC's CDR, such as service registration element for subscriber, MCC & MNC for a particular user (MSISDN) under roaming case, event associated with content, time duration for a service such as streaming.. The BM-SC should be able to pass the CDR to billing system.

**Summary of change:** ☹ The detailed application level charging mechanisms is added in section 10.3.

**Consequences if not approved:** ☹ If the application level charging information mentioned above are not generated or included in BM-SC's CDR, the MBMS cannot be charged properly and operator can not get proper revenue.

**Clauses affected:** ☹ 8.2, 8.10, 10.3

	Y	N		
<b>Other specs Affected:</b>	X		Other core specifications	☹ 29.060, 29.061
		X	Test specifications	
		X	O&M Specifications	

**Other comments:** ☹

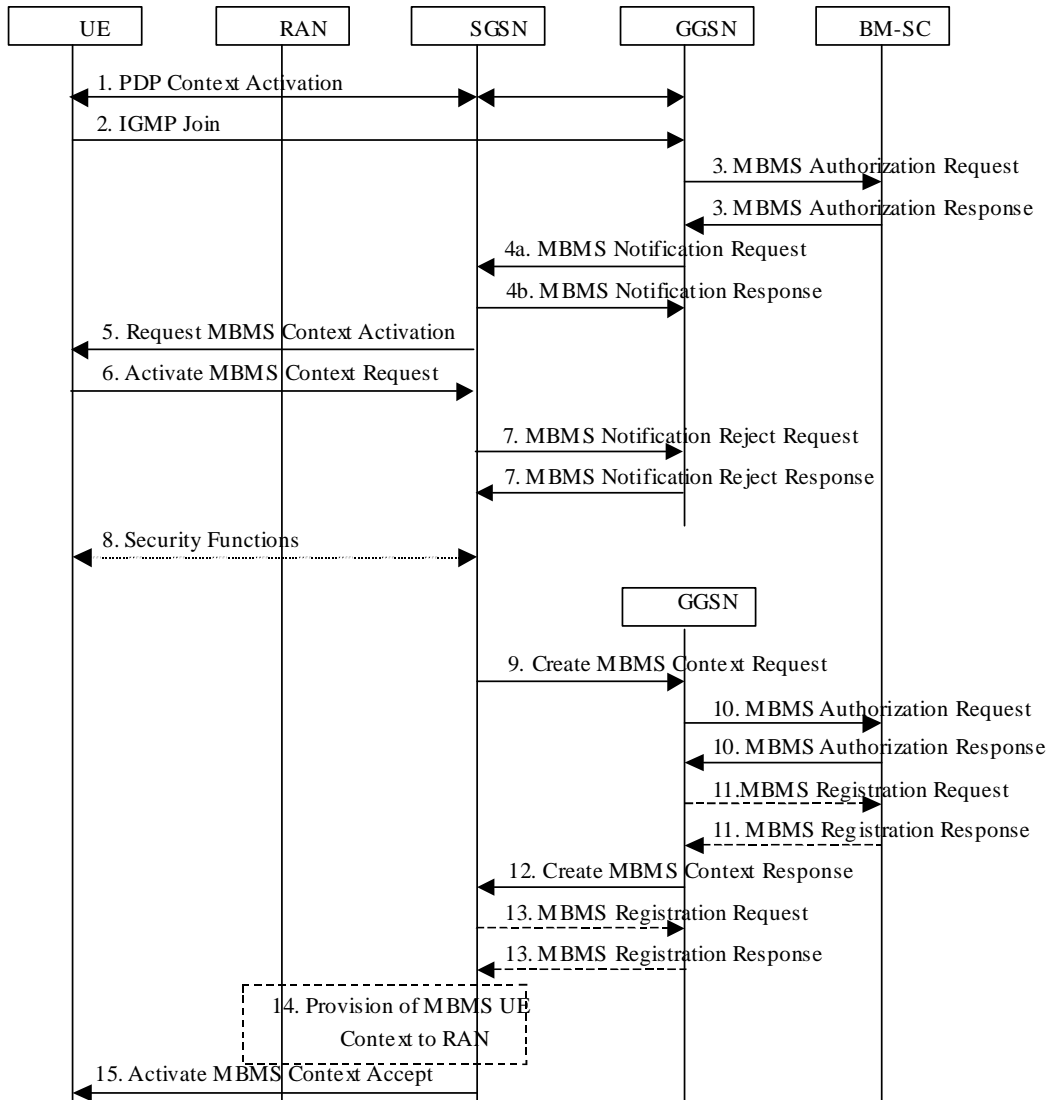
**How to create CRs using this form:**

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

## 8.2 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.
- 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, 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. 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.
8. Security Functions may be performed, e.g. to authenticate the UE.
9. The SGSN creates an MBMS UE context and sends a Create MBMS Context Requests (IP multicast address, APN, MBMS\_NSAPI, [IMSI, MSISDN, Serving network identity](#)) to the GGSN.
10. The GGSN sends an MBMS Authorization Request ([IMSI, MSISDN, Serving network identity](#)) 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.

\*\*\*\*\* 2<sup>nd</sup> modified section \*\*\*\*\*

## 8.10 Inter SGSN Routeing Area Update

This procedure is performed when a UE with active MBMS bearer service performs a Routeing Area Update and the serving SGSN changes. It bases on the Inter SGSN Routeing Area Update procedure specified in TS 23.060. The procedure is performed regardless whether MBMS sessions are ongoing or not. The handling of any PDP contexts established by the UE is not changed compared to the procedure without MBMS. The procedure described below does not show all details of the Routeing Area update procedure. Only for the MBMS specific additions the steps are described.

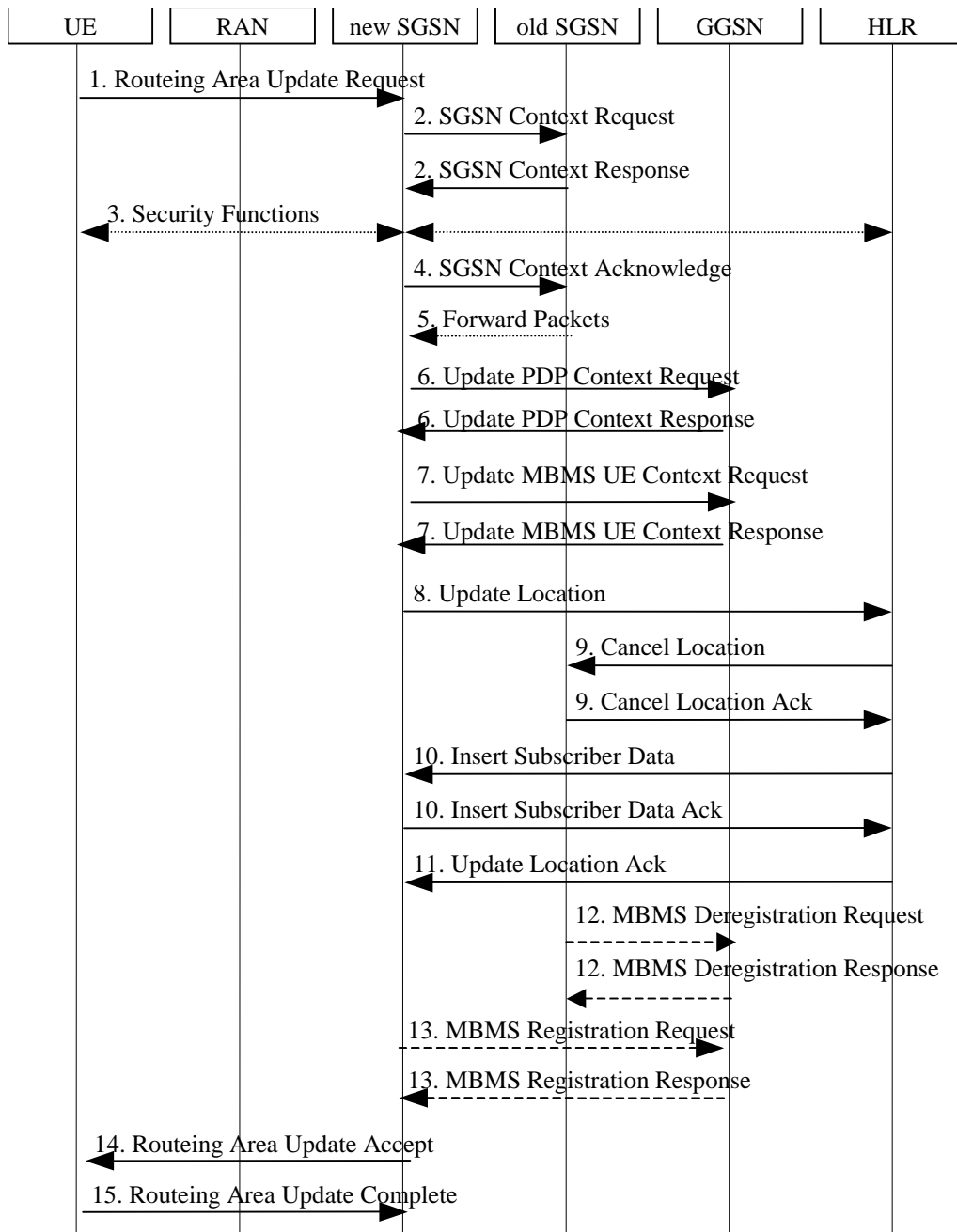


Figure 14: Inter SGSN Routeing Area Update

- 2) The context transfer in step 2 includes the transfer of the MBMS UE Context(s).
- 7) The new SGSN sends Update MBMS UE Context Request ([Serving network identity](#)) to the GGSNs concerned. The GGSNs update their MBMS UE Context fields and return Update MBMS UE Context Response. [Also, GGSN sends updated Serving network identity to the BM-SC if necessary.](#)
- 12) If the old SGSN does not have any more MBMS UE Contexts for the MBMS bearer service(s) and the "list of downstream nodes" in the corresponding MBMS Bearer Context is empty, the SGSN sends an MBMS Deregistration Request to the GGSN. The GGSN responds with an MBMS Deregistration Response and removes the identifier of the SGSN from the "list of downstream nodes" parameter in its MBMS Bearer Context. See subclause "MBMS Deregistration Procedure".
- 13) The new SGSN verifies for each MBMS UE Context received whether it has a corresponding MBMS Bearer Context. For each MBMS Bearer Context the SGSN does not already have the SGSN creates an MBMS Bearer Context (in "Standby" state) and sends an MBMS Registration Request to a GGSN. This registration is described in subclause "MBMS Registration Procedure".

\*\*\*\*\*3<sup>rd</sup> modified section\*\*\*\*\*

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## 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. 3<sup>rd</sup> 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 3GPP TS 23.125 [12] 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

In order to meet the MBMS charging requirements in 22.146 and 22.246, the following elements and functionalities are provided by the MBMS architecture:

- a) The MSISDN and IMSI are passed to the BM-SC. This provides the operator with the ability to associate GPRS location information (i.e. serving network identity) with a user.
- b) In order to permit differential roaming tariffs, the serving network identity is provided to the BM-SC.

c) Charging for MBMS services is based on application layer mechanisms, since it is only at the application layer that security is provided which can restrict content to authorised users or confirm delivery of content to users

The following general requirements apply to charging information generated by the BM-SC:

Charging information generated for application layer charging events should include the above information provided by the GPRS network to facilitate differential roaming tariffs.

Charging information should include an indicate of the point at which the user had access to the content (e.g. if and when decryption keys for encrypted content are sent to the UE.).

## 10.4 Generation of charging records in the VPLMN

In order to permit the settlement of inter-operator roaming charges , the SGSN needs to raise CDRs.

The information that needs to be included on these CDRs is FFS. \_\_\_\_\_

CR-Form-v7

## CHANGE REQUEST

⌘ 23.246 CR 094 ⌘ rev 1 ⌘ Current version: 6.3.0 ⌘

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


<b>Title:</b>	⌘ MBMS Session Notification		
<b>Source:</b>	⌘ SA2 (Telecom Italia S.p.A.)		
<b>Work item code:</b>	⌘ MBMS	<b>Date:</b>	⌘ 17/08/2004
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b>	⌘ Rel-6
	Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		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)

<b>Reason for change:</b>	⌘ Last SA1#25 agreed to apply the requirement on "Notification of MBMS session during an ongoing CS or PS domain connection" only to UTRAN case, for Release 6 (S1-040706):  "While receiving PS or CS services via UTRAN, it shall be possible for the user to receive notification of MBMS multicast sessions".  This was done according to GERAN #20 indication that the requirement of MBMS notification while in GERAN could not be fulfilled in the Release 6 timeframe.  It is proposed to update also the stage 2 to reflect such modification.
<b>Summary of change:</b>	⌘ Text on GERAN specific procedures for notification of MBMS session during an ongoing CS or PS domain "connection" is deleted.
<b>Consequences if not approved:</b>	⌘ Misalignment with stage 1 requirement. Inconsistent specification: the stage 2 text would describe procedure not implemented in stage 3 GERAN

<b>Clauses affected:</b>	⌘ 8.17						
<b>Other specs Affected:</b>	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px;">Y</td> <td style="width: 20px;">N</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table> Other core specifications	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	⌘	
Y	N						
<input type="checkbox"/>	<input checked="" type="checkbox"/>						
	<input checked="" type="checkbox"/>	Test specifications	⌘				
	<input checked="" type="checkbox"/>	O&M Specifications	⌘				
<b>Other comments:</b>	⌘						

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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 BSC to notify the UE when MBMS session starts.~~

[These procedures are not supported by GERAN in this version of the specification.](#)

CR-Form-v7			
<b>CHANGE REQUEST</b>			
⌘	<b>23.246</b>	CR	095
⌘	rev	⌘	Current version: <b>6.3.0</b> ⌘

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

<b>Title:</b>	⌘ Removing FFS from TS 23.246		
<b>Source:</b>	⌘ SA2 (NEC)		
<b>Work item code:</b>	⌘ MBMS		<b>Date:</b> ⌘ 16/08/2004
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b>	⌘ Rel-6
Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		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)	

<b>Reason for change:</b>	⌘ Removing FFS to get MBMS stage 2 3GPP TS 23.246 stable.		
<b>Summary of change:</b>	⌘ Removed "tracking/non-tracking area are FFS" because it is no longer used for MBMS in the section 8.14 MBMS.		
<b>Consequences if not approved:</b>	⌘ Other groups may get confused and do unnecessary work.		

<b>Clauses affected:</b>	⌘ 8.14										
<b>Other specs Affected:</b>	<table border="1" style="border-collapse: collapse;"> <tr> <td style="width: 20px;">Y</td> <td style="width: 20px;">N</td> </tr> <tr> <td style="text-align: center;">⌘</td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;">⌘</td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;">⌘</td> <td style="text-align: center;">X</td> </tr> </table>	Y	N	⌘	X	⌘	X	⌘	X		Other core specifications ⌘ Test specifications O&M Specifications
Y	N										
⌘	X										
⌘	X										
⌘	X										
<b>Other comments:</b>	⌘ CR 057 rev 3 removed all other "FFS" on "trancking/non-tracking area".										

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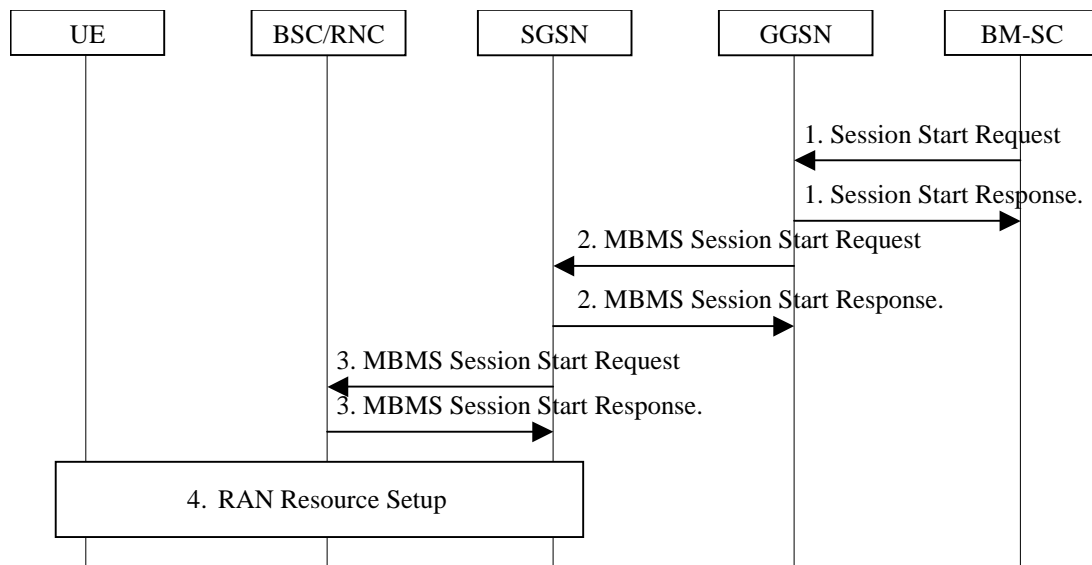
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

## 8.14 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 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  $\bar{\bar{O}}$ ) 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-v7

## CHANGE REQUEST

**23.246** CR **097** rev - Current version: **6.3.0**

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

<b>Title:</b>	Clarification of reference model		
<b>Source:</b>	SA2 (Ericsson)		
<b>Work item code:</b>	MBMS	<b>Date:</b>	8/7/2004
<b>Category:</b>	<b>F</b>	<b>Release:</b>	Rel-6
	<p>Use <u>one</u> of the following categories:</p> <ul style="list-style-type: none"> <li><b>F</b> (correction)</li> <li><b>A</b> (corresponds to a correction in an earlier release)</li> <li><b>B</b> (addition of feature),</li> <li><b>C</b> (functional modification of feature)</li> <li><b>D</b> (editorial modification)</li> </ul> <p>Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a>.</p>		<p>Use <u>one</u> of the following releases:</p> <ul style="list-style-type: none"> <li>2 (GSM Phase 2)</li> <li>R96 (Release 1996)</li> <li>R97 (Release 1997)</li> <li>R98 (Release 1998)</li> <li>R99 (Release 1999)</li> <li>Rel-4 (Release 4)</li> <li>Rel-5 (Release 5)</li> <li>Rel-6 (Release 6)</li> </ul>

<b>Reason for change:</b>	Unclear definition of what's included in the MBMS service.
<b>Summary of change:</b>	<p>Removal of the Multicast Broadcast Source functional entity in the MBMS reference model. This functional entity does not really belong to MBMS but indicates the already standardized normal IETF multicast. Multicast traffic entering GGSN from such a source, should be addressed with with separate IP multicast addresses (from MBMS address ranges) and are only mapped to ordinary point-to-point PDP Contexts and never to MBMS bearers. The specification of this functionality is already done in other specifications and does not belong in the MBMS TS 23.246.</p> <p>The name of the multicast source residing within the PLMN domain is renamed from Content Provider to Content Provider / Multicast Broadcast Source. The name Content Provider can be misleading since it indicates that when the source resides within the PLMN domain, it has a different architecture. Since this does not have to be the case, the same name of both MBMS sources are used regardless if they reside inside or outside the PLMN domain.</p> <p>The naming of the GGSN/TPF is slightly changed to better reflect the main function of the functional entity.</p>
<b>Consequences if not approved:</b>	Unclear definition of MBMS architecture and roles of different functional entities.

<b>Clauses affected:</b>	4.2				
<b>Other specs</b>	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="text-align: center;">Y</td> <td style="text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"> </td> <td style="text-align: center;">X</td> </tr> </table> Other core specifications	Y	N		X
Y	N				
	X				

**affected:**

<input checked="" type="checkbox"/>	Test specifications
<input checked="" type="checkbox"/>	O&M Specifications


**Other comments:**



### How to create CRs using this form:

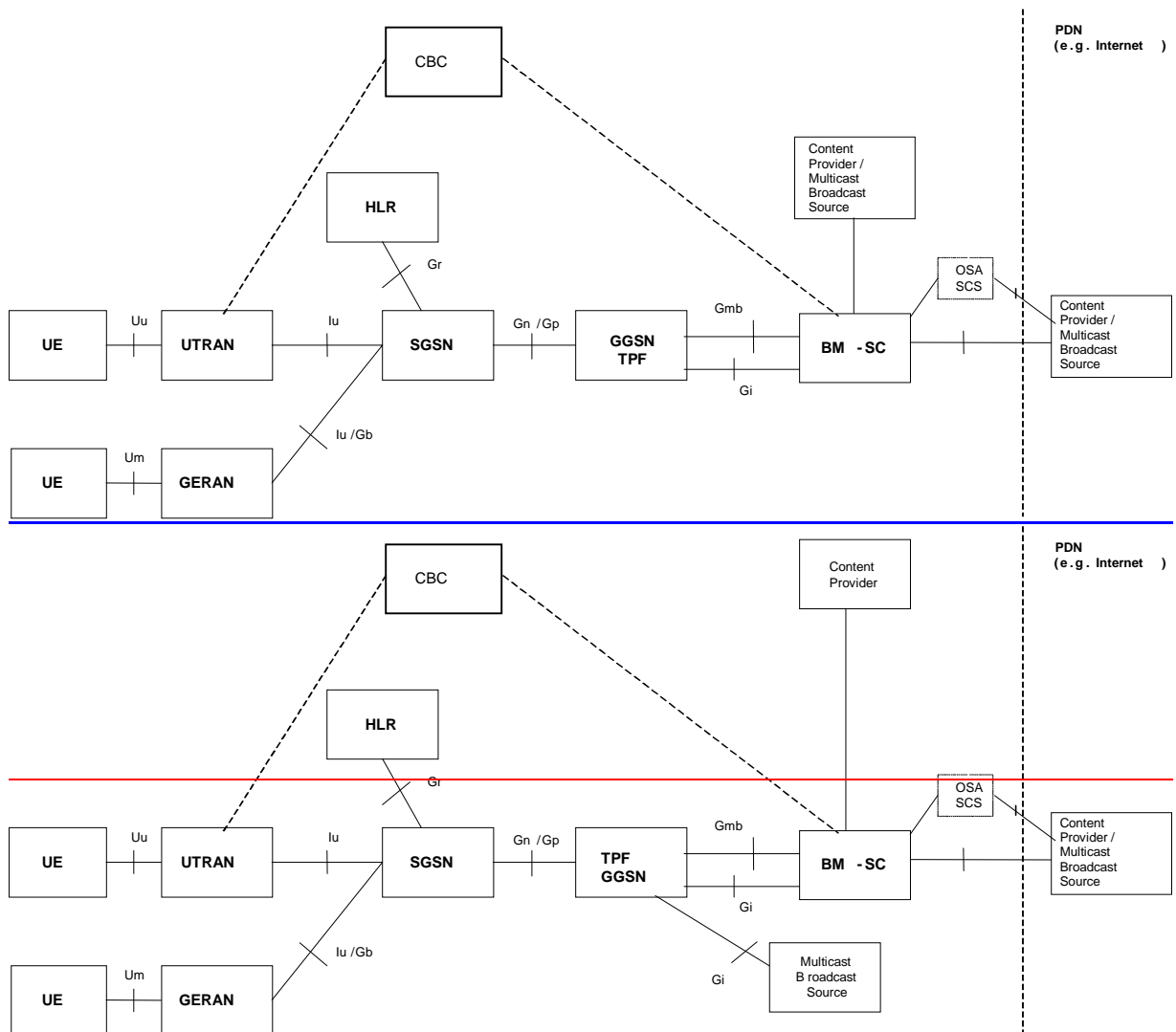
Comprehensive information and tips about how to create CRs can be found at <http://www.3gpp.org/specs/CR.htm>.

Below is a brief summary:

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

# First Modification

## 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**

CR-Form-v7

## CHANGE REQUEST

23.246 CR 099 rev 2 Current version: 6.3.0

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

<b>Title:</b>	Service Context creation in RNC		
<b>Source:</b>	SA2 (Nortel Networks)		
<b>Work item code:</b>	MBMS	<b>Date:</b>	06/08/2004
<b>Category:</b>	<b>F</b>	<b>Release:</b>	Rel-6
	Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		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)


<b>Reason for change:</b>	The current specification indicates a condition to allow a BSC/RNC to create a MBMS Service Context in order to store service information: it is indicated that a BSC/RNC memorizes service information only if it serves the MBMS Service Area. But this restriction does not allow service delivery to all UEs: a UE attaching to a SRNC not covering a Multicast Area and moving (via Iur) in a MBMS Service Area under a DRNC: will not be able to receive MBMS data in ptp way as its SRNC will have no MBMS Service information.
<b>Summary of change:</b>	Remove the condition "If the BSC/RNC serves the MBMS Service Area": a BSC/RNC receiving a Session Start shall always memorize the session attributes even if it does not cover the Multicast Area as it may need to distribute data via Iur to a far away Multicast Area served by an other RNC (DRNC).
<b>Consequences if not approved:</b>	UEs arriving in a Multicast Area under a new RNC via Iur will not receive data if ptm is not used in this RNC.

<b>Clauses affected:</b>	8.3						
<b>Other specs affected:</b>	<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 checked="" type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table> Other core specifications	Y	N	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Y	N						
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>						
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table> Test specifications	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>						
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table> O&M Specifications	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>						
<b>Other comments:</b>							

**How to create CRs using this form:**



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

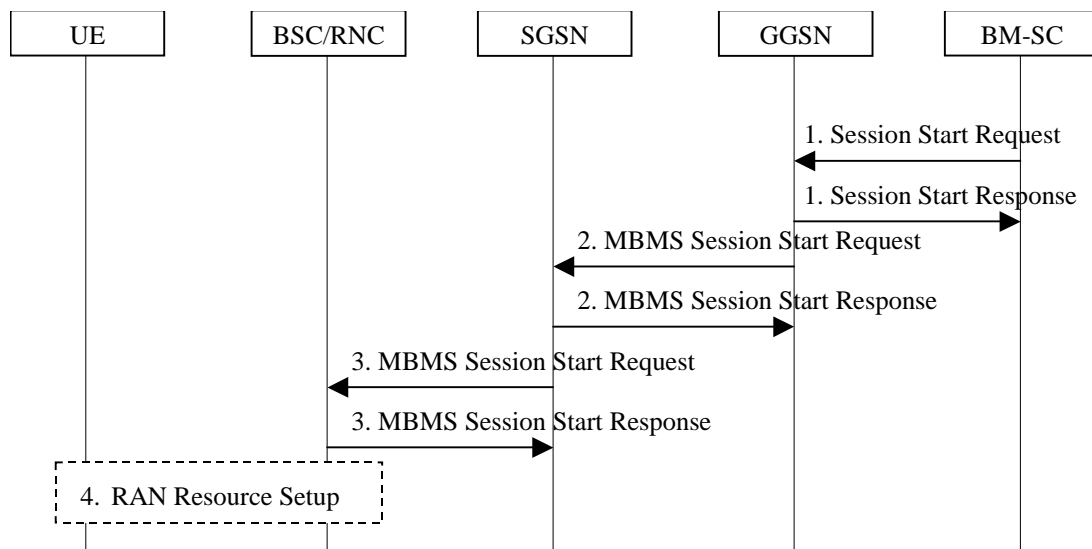
- 1) Fill out the above form. The symbols above marked  contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") 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.

## 8.3 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, 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 in Iu mode/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. A BSC in Gb mode which does not serve the MBMS Service Area may decide not to store the session attributes and not to set the state of its MBMS Service Context to "Active". 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.

## CHANGE REQUEST

⌘ **23.246** CR **101** ⌘ rev **0** ⌘ Current version: **6.3.0** ⌘

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

<b>Title:</b>	⌘ Correction for error handling in MBMS multicast activation		
<b>Source:</b>	⌘ SA2 (Siemens)		
<b>Work item code:</b>	⌘ MBMS	<b>Date:</b>	⌘ 16/07/2004
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b>	⌘ Rel-6
	Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		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)

<b>Reason for change:</b>	⌘ The MBMS bearer service activation describes different error handling for unsuccessful cases. One error case (step 7) stops the procedure without any further action. The other (step 4) results optionally in a different bearer. The UE and the user service will only be able to know the result before any MBMS data transmission because of the two options for the activation result.  It is proposed to stop the procedure in both error cases so that UE or user service get clear results. The user service may decide on further actions, e.g. use the ptp repair capability, which offers better QoS capabilities and better resource usage than the currently described option.  Step 4a) describes the reception of IGMP/MLD join, which is already in step 2. This causes confusion for the step in between and should be removed.  Step 11 describes that TMGI is passed to the UE. It is not indicated in step 15 and should be added.
<b>Summary of change:</b>	⌘ Removal of ambiguities in cases of unsuccessful multicast activation.
<b>Consequences if not approved:</b>	⌘ Different behaviour for different error cases. Unclear status for UE and user service about bearer type and activation status.

<b>Clauses affected:</b>	⌘ 8.2						
<b>Other specs Affected:</b>	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table> Other core specifications	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	⌘	
Y	N						
<input type="checkbox"/>	<input checked="" type="checkbox"/>						
	<input checked="" type="checkbox"/>	Test specifications					
	<input checked="" type="checkbox"/>	O&M Specifications					

**Other comments:** ☹

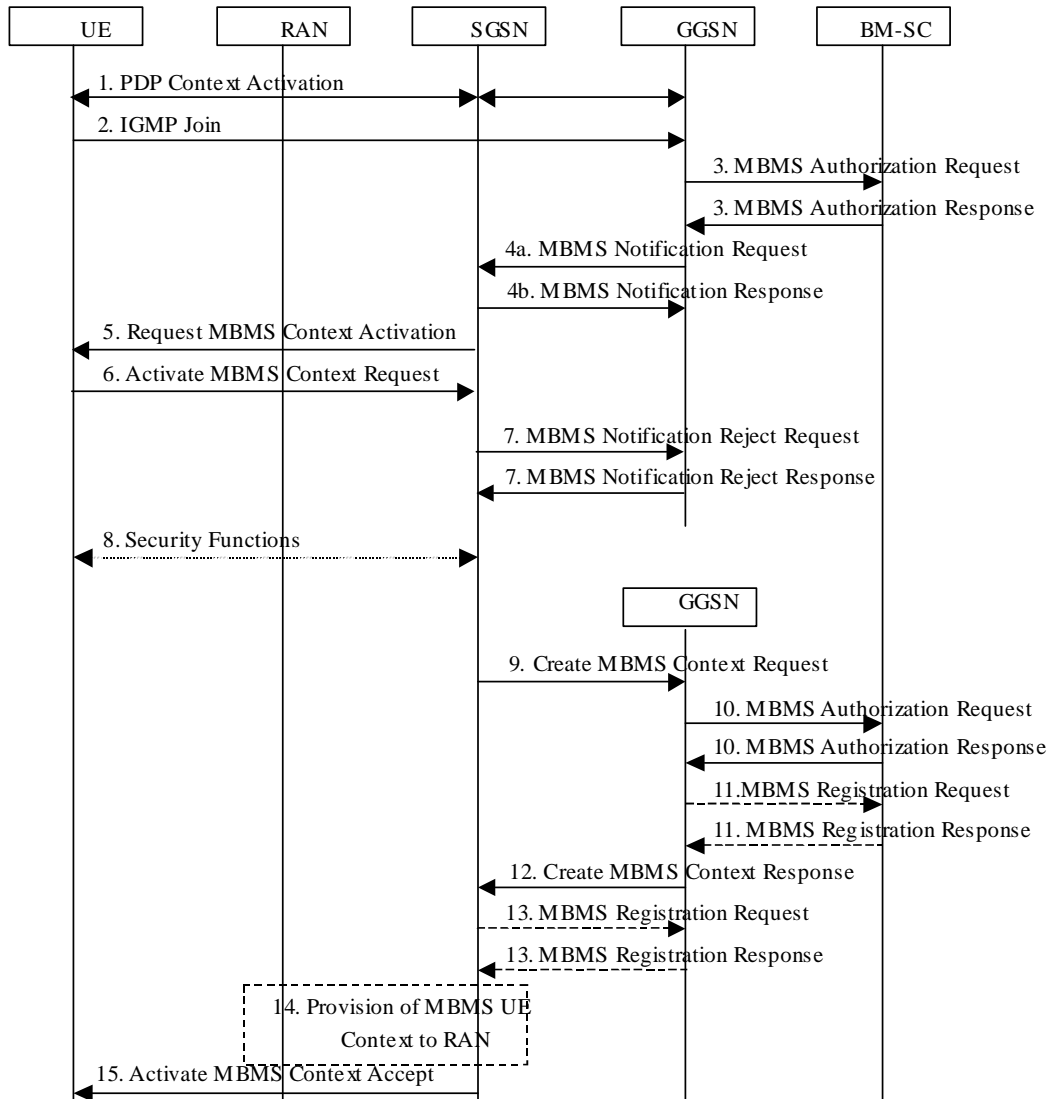
### **How to create CRs using this form:**

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

- 1) Fill out the above form. The symbols above marked ☹ contain pop-up help information about the field that they are closest to.
- 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, 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.
- 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 the GGSN should not send any further MBMS Notification Request messages. The procedure is then terminated, ~~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, 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. 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.
8. Security Functions may be performed, e.g. to authenticate the UE.
9. 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 (TMGI, 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 103 ⌘ rev 1 ⌘ Current version: 6.3.0 ⌘

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

<b>Title:</b>	⌘ MBMS BSC UE context and bearer plane		
<b>Source:</b>	⌘ SA2 (Siemens)		
<b>Work item code:</b>	⌘ MBMS	<b>Date:</b>	⌘ 04/08/2004
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b>	⌘ Rel-6
	Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		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)

<b>Reason for change:</b>	⌘ Currently the TS describes a UE context in the BSC as FFS. As there is no need for such a context in Gb mode it should be indicated that there is no UE context for the Gb mode BSC. Iu mode is the same as for RNC.  The bearer plane handling, especially for the case of Iu flex is described for Iu bearer plane only. The established of only one bearer between one BSC/RNC and one SGSN should be stated in general and not only for Iu mode RNC.
<b>Summary of change:</b>	⌘ Clarify FFS on MBMS UE context in BSC. And description of only one bearer plane between one BSC/RNC and one SGSN in general.
<b>Consequences if not approved:</b>	⌘ Open issues MBMS UE context in BSC and bearer plane between BSC and SGSN.

<b>Clauses affected:</b>	⌘ 6.1, 6.2, 8.2, 8.3, 8.14						
<b>Other specs Affected:</b>	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table> Other core specifications	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	⌘	
Y	N						
<input type="checkbox"/>	<input checked="" type="checkbox"/>						
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="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						
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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> O&M Specifications	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Y	N						
<input type="checkbox"/>	<input checked="" type="checkbox"/>						
<b>Other comments:</b>	⌘						

**How to create CRs using this form:**

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

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

- 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, 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.

In Iu mode, all MBMS UE Contexts of a UE are provided via MBMS UE Linking mechanism to the BSC/SRNC at least when the first PS RAB is established for the UE, or when the UE performs MBMS Multicast Service Activation. MBMS UE Contexts are provided to the [Iu mode](#) 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 [Iu mode](#) BSC/RNC, the MBMS UE Contexts are stored as part of the UE Context of the BSC/RNC.

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

**Table 1: MBMS UE Context**

Parameter	Description	UE	SGSN	GGSN	RNC	BSC	BM-SC
IP multicast address	IP multicast address identifying an MBMS bearer that the UE has joined.	X	X	X	X	Iu - X Gb - <del>FFS</del> none	X
APN	Access Point Name on which this IP multicast address is defined.	X	X	X	X	Iu - X Gb - <del>FFS</del> none	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)	<del>FFS</del> Iu - (2) Gb ñ (3)	X
TI	Transaction Identifier	X	X				
MBMS_NSAPI	Network layer Service Access Point Identifier which identifies an MBMS UE Context.	X	X	X			

(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.

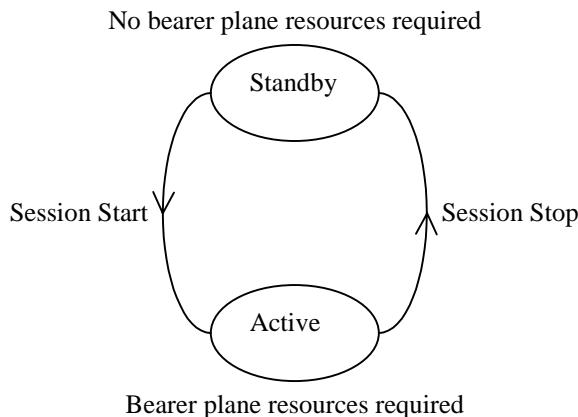
(3) [IMSI availability does not depend on MBMS.](#)

## 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 [Iu mode](#) BSC and in ~~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.

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**

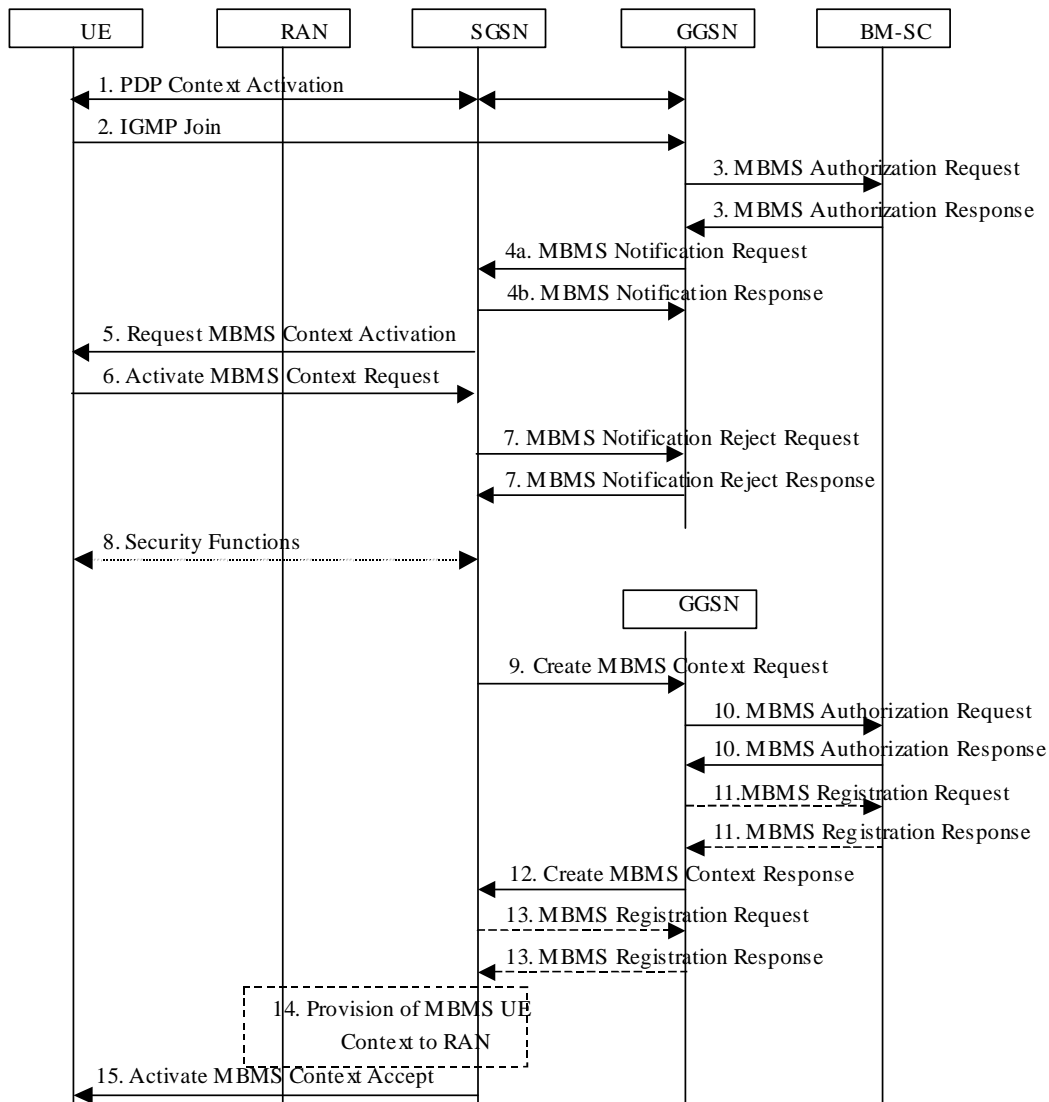
Parameter	Description	RAN	SGSN	GGSN	BM-SC
IP multicast address	IP multicast address identifying the MBMS bearer described by this MBMS Bearer Context.	X	X	X	X
APN	Access Point Name on which this IP multicast address is defined.	X	X	X	X
TMGI	Temporary Mobile Group Identity allocated to the MBMS bearer service.	X	X	X	X
State	State of bearer plane resources (standby or active)	X	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	Number of UEs hosted by the node that have joined the multicast MBMS bearer service.		X	X	
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 <sup>(1)</sup>		
List of RAs	List of RAs, each of which contains at least one UE that has joined the MBMS service.	X <sup>(1)</sup>			

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.

## 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 Iu mode 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.
- 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, 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. 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.
8. Security Functions may be performed, e.g. to authenticate the UE.
9. 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".

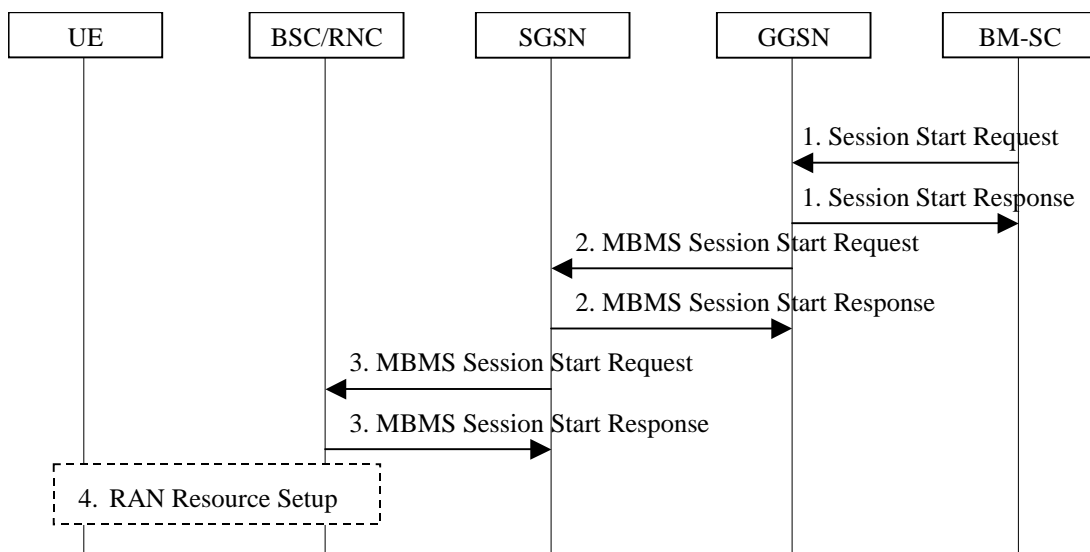
The GGSN responds with a MBMS Registration Response containing the MBMS Bearer Context information for this MBMS bearer service and adds the identifier of the SGSN to the "list of downstream nodes" parameter in its MBMS Bearer Context. See subclause "MBMS Registration Procedure".
14. The SGSN provides [Iu mode](#) 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.

## 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, 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. A BSC/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 with 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, a BSC/RNC may receive the MBMS Session Start Request message from several SGSNs.

### 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 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:

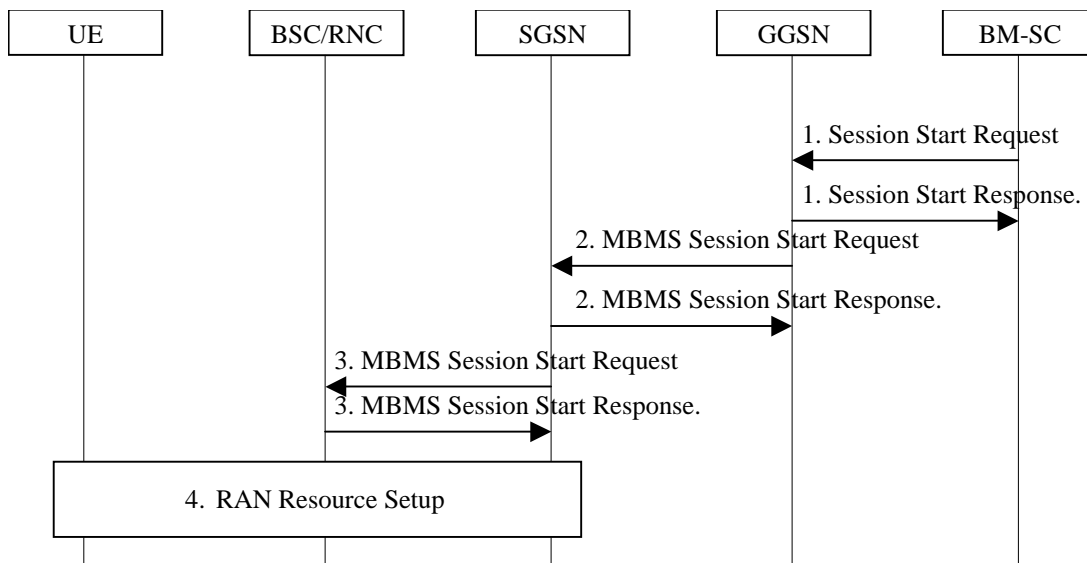


Figure 16 Session Start procedure for Broadcast MBMS Bearer Service

- 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  $\bar{O}$ ) 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 Lu mode BSC/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. A BSC/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 with 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, a BSC/RNC may receive the MBMS Session Start Request message from several SGSNs.

CR-Form-v7

## CHANGE REQUEST

⌘ 23.246 CR 106 ⌘ rev 2 ⌘ Current version: 6.3.0 ⌘

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

<b>Title:</b>	⌘ Allocation and retention priority for MBMS bearers		
<b>Source:</b>	⌘ SA2 (Siemens)		
<b>Work item code:</b>	⌘ MBMS	<b>Date:</b>	⌘ 16/07/2004
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b>	⌘ Rel-6
	Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		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)


<b>Reason for change:</b>	⌘ One not accepted CR (S2-041767) proposed already to prioritise between MBMS bearers by means of traffic handling priority. A RAN3 LS (S2-041729) asked whether the Allocation and Retention Priority (ARP) is significant for a user or for the whole MBMS bearer. There was some agreement that it is for the bearer and postponed for more evaluations.  At least for ptm MBMS RABs it is obvious that ARP can take only one value. It is therefore significant for the whole MBMS bearer and not for specific users. Users may have different ARPs. So ARP of the MBMS bearer may be used for prioritisation between MBMS bearers.  It is proposed to use ARP for prioritisation between MBMS bearers.
<b>Summary of change:</b>	⌘ Use of ARP for prioritisation between MBMS bearers.
<b>Consequences if not approved:</b>	⌘ No means for prioritisation between MBMS bearers.

<b>Clauses affected:</b>	⌘ 8.2										
<b>Other specs Affected:</b>	<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 Test specifications O&M Specifications	⌘
Y	N										
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<input type="checkbox"/>	<input checked="" type="checkbox"/>										
<b>Other comments:</b>	⌘										

### How to create CRs using this form:

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

Below is a brief summary:

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

## 6.3 Quality-of-Service

It shall be possible for the network to control quality-of-service parameters for sessions of multicast and broadcast MBMS bearer services. All QoS attributes described in 3GPP TS 23.107 [3] are applicable to MBMS bearer services. Compared to point-to-point bearer services the following limitations exist:

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

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

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

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

MBMS user services that would normally use MBMS bearer services of background class may however need to use a streaming class MBMS bearer service. This will reduce packet loss due to congestion, since a minimum bit-rate is guaranteed. Otherwise the MBMS user service will have to provide sufficient redundancy within the data to be able to cope with the high packet loss.

[The Allocation and Retention Priority of the MBMS bearer service allows for prioritisation between MBMS bearer services and between MBMS bearer services and non MBMS bearer services.](#)

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

CR-Form-v7

## CHANGE REQUEST

23.246 CR 107 rev 1 Current version: 6.3.0

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

<b>Title:</b>	Merged CR 88 Separate Rendering of 2G and 3G Content for the Same Service, CR 90 Definition of Session Identity and CR92 Additional information needed in section 8.3 Session Start Message		
<b>Source:</b>	SA2 (Vodafone)		
<b>Work item code:</b>	MBMS	<b>Date:</b>	20/08/2004
<b>Category:</b>	F	<b>Release:</b>	Rel-6
	Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		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:** Merging CRs 88, 90 and 92 together.

CR92: In order to establish a MBMS bearer session, TMGI need to be known in RNC/BSC for paging purpose in MBMS session start message.

CR90: If the session retransmission is not clarified properly in stage 2 level, the definition of session repetitions via session identity may diverge in RAN and GERAN.

In stage 2 specification TS 23.246, the session retransmission is used for scheduling the same session at different session start times.

In order to support the session retransmission functionality in RAN/GERAN, a session repetition should be used for extremely popular services (e.g. goals of national football team) where large numbers (but still a small proportion of those subscribed for the service) of people may miss the first transmission (e.g. out of coverage, switched off or in voice call, etc).

RAN/GERAN needs to optimise the messages after first time transmission, e.g. the 75% of users who successfully received the service at the first time should not be reallocated radio resources again for 2<sup>nd</sup> or 3<sup>rd</sup> transmission.

CR88: As a result of the detailed stage 3 design, it can be seen that the MBMS bearers' data rates in 2G and 3G are likely to be significantly different.

A consequence of this is that there is a strong need to render (some of the) content differently for 2G and 3G coverage areas in terms of different view times, resolutions, and refreshing rates, etc.

For example, in 2G coverage a 10 second 128 kbit/s video clip could be

downloaded to the mobile when a football goal has been scored. However, in 3G coverage, more of the lead up to the goal could be shown by providing a 20 second clip and more detail could be provided by using video with 256 kbit/s quality.

The customer would obviously prefer the 3G experience, but, if they are outside of 3G coverage, they would benefit from the timely delivery of the 2G content. Hence, the same service with different types of contents should be rendered differently for 2G and 3G.

**Summary of change:** ⓘ CR92: The additional parameter TMGI is added in section 8.3 Session start message.  
 ⓘ CR90: The use of the session identifier is expanded in 5.1.3 and it is incorporated in the message sequence in 8.3.  
 ⓘ CR88: Two TMGIs are allocated to 2G and 3G for the same content that is added in the new section 5.1.5. The related changes are modified in the section 8.3 respectively.

**Consequences if not approved:** ⓘ CR92: It causes problems for RAN/GERAN implementation.  
 ⓘ CR90: If it is not approved, it causes confusion to RAN and GERAN leading to incorrect design and waste of radio resources.  
 ⓘ CR88: For the same service and content, if only one pair of IP multicast address and TMGI is allocated for both 2G and 3G services, the differential rendering of content for the same service can not be delivered.

**Clauses affected:** ⓘ 5.1.3, 5.1.5 (new clause), 8.3

<b>Other specs Affected:</b>	<input type="checkbox"/>	<input type="checkbox"/>	Other core specifications	ⓘ 29.060, 29.061, 26.346
	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	O&M Specifications	

**Other comments:** ⓘ

**How to create CRs using this form:**

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

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

\*\*\*\*\* 1<sup>st</sup> change \*\*\*\*\*

### 5.1.3 MBMS Transmissions

The BM-SC should be able to accept content from external sources and transmit it using error resilient schemes (e.g. specialized MBMS codecs).

Further, the BM-SC might be used to schedule MBMS session transmissions, retrieve content from external sources and provide this content using MBMS bearer services.

The BM-SC should be able to schedule MBMS session retransmissions, and label each MBMS session with an MBMS Session Identifier to allow the UE to distinguish the MBMS session retransmissions. ~~These retransmissions are transparent to the RAN and MBMS user service.~~

Each transmission and subsequent retransmission(s) of a specific MBMS session are identifiable by a common MBMS Session Identifier (2-3 Octets) passed at the application layer in the content, and also passed in a shortened form (i.e. the least significant octet) in the MBMS Session Start Request message to the RNCs/BSCs. The full MBMS Session Identifier should be used by the UE to identify an MBMS session when completing point-to-point repair, while the shortened MBMS Session Identifier is included by the RANs in the notification messages for MBMS.

### 5.1.4 Service Advertisement and Description

The BM-SC shall be able to provide service announcements for multicast and broadcast MBMS user services.

The BM-SC shall be able to provide the UE with media descriptions specifying the media to be delivered as part of an MBMS user service (e.g. type of video and audio encodings).

The BM-SC shall be able to provide the UE with MBMS session descriptions specifying the MBMS sessions to be delivered as part of an MBMS user service (e.g. multicast service identification, addressing, time of transmission, etc.)

The BM-SC shall be able to deliver media and session descriptions by means of service announcements using IETF specified protocols over MBMS multicast and broadcast bearer services.

### 5.1.5 Separate MBMS Bearer Services for 2G and 3G for the same MBMS User Service

The same MBMS user service may transfer its data on separate MBMS bearer services for 2G or 3G coverage, typically with different QoS. For this purpose two IP multicast addresses and the associated two TMGIs should be allocated for the same MBMS user service. One pair of IP multicast address and TMGI is for 2G coverage and another pair of IP multicast address and TMGI is for 3G coverage. The detailed impacts on the network nodes are listed below:

- a) The service announcement instructs the UE to join two multicast MBMS bearer services (one is for 2G coverage and the other is for 3G coverage), i.e. two IP multicast addresses allocated in BM-SC will be sent to UE within one service announcement message.
- b) A UE that might move between 3G coverage areas and 2G coverage areas activates both MBMS bearer services.
- c) The UE monitors the paging/notification channels for both TMGIs and receives MBMS data when transferred by the MBMS bearer services.
- d) When the BM-SC needs to deliver the content, the BM-SC produces two sets of MBMS data from the same content and sends independent Session Start messages for both of the MBMS bearer services. The "different" 2G and 3G content streams for the same MBMS user service are sent on the different IP multicast address associated with 2G and 3G TMGIs. A 2G/3G indicator in the Session Start message (which the GGSN passes transparently to the SGSN) indicates whether the content should be delivered in 2G-only or 3G-only (or both) coverage areas.
- e) The SGSN uses the 2G/3G indicator to decide whether a MBMS Session Start Request message should be sent to the BSCs and/or the RNCs.

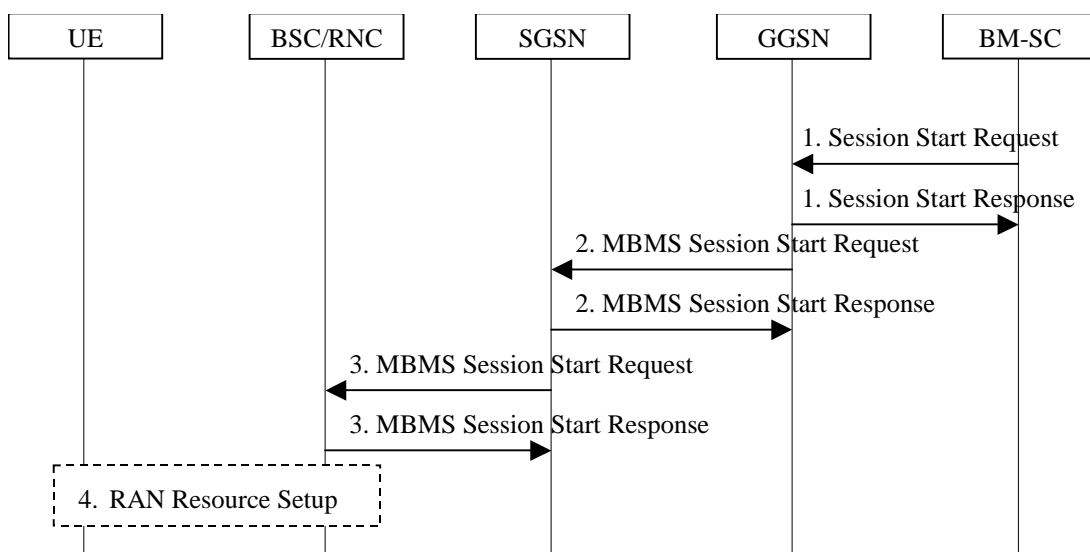
Although this procedure mentions 2G and 3G extensively, only the BM-SC (which renders the content differently) and the SGSN have to implement functionality to deliver this. The GGSN, RNC and BSC shall all be transparent to this functionality.

## 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, 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 (TMGI, QoS, MBMS service Area, [Session identifier](#), estimated session duration) and the 2G/3G indicator 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 containing the session attributes (TMGI, QoS, MBMS service Area, [Session identifier](#), estimated session duration) and the 2G/3G indicator to the SGSNs listed in the "list of downstream nodes" parameter of the corresponding MBMS Bearer Context. The SGSN stores the session attributes and the 2G/3G indicator 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 (TMGI, QoS, MBMS service Area, [Session identifier](#), estimated session duration) to each BSC and/or each RNC that is connected to this SGSN. The 2G/3G indicator shall be used by the SGSN to determine whether the MBMS Session Start Request message is sent only to BSCs, or only to RNCs, or to both RNCs and BSCs. 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.