3GPP TSG CN Plenary Meeting #27 **NP-050044**
9th – 11th March 2005 Tokyo, JAPAN.

Source: TSG CN WG4

Title: Corrections on MBMS

Agenda item: 9.8

Document for: APPROVAL

Doc-2nd-Level	Spec	CR	Rev	Phase	Subject	Cat	Ver_C
N4-050093	23.003	097		Rel-6	Clarification of the TMGI	F	6.5.0
N4-050137	29.060	531		Rel-6	Providing the BM-SC with approximate UE location information at MBMS context activation	F	6.7.0
N4-050340	29.060	547	1	Rel-6	Enhanced NSAPI for MBMS	F	6.7.0
N4-050341	29.060	546	1	Rel-6	Adding missing parameters to the MBMS Session Start Request message	F	6.7.0
N4-050342	29.060	549		Rel-6	Change of newly added Ies in Rel-6 to type TLV	F	6.7.0

3GPP TSG-CN WG4 Meeting #26 **N4-050093**
Sydney, AUSTRALIA. 14th to 18th February 2005.

CR-Form-v7.1

CHANGE REQUEST

⌘ **23.003** **CR** **097** ⌘ **rev** **-** ⌘ Current version: **6.5.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Clarification of the TMGI
Source:	⌘	CN4
Work item code:	⌘	MBMS
Date:	⌘	26/01/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one 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)*

Reason for change:	⌘	There is information in the definition of TMGI which is also present in the MBMS stage 2, 3GPP TS 23.246.
Summary of change:	⌘	Removal of duplicate information and a reference to the MBMS stage 2.
Consequences if not approved:	⌘	Multiple definitions of TMGI, although in-alignment today, will ultimately diverge at some stage in the future leading to mis-aligned specifications which in turns leads to FUD.

Clauses affected:	⌘	15.2

		Y	N		
Other specs affected:	⌘		X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	

Other comments:	⌘	There is no dependancy on a CR to the MBMS stage 2 as there is no information that needs to be moved there.

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.

15 Identification of Multimedia Broadcast/Multicast Service

15.1 Introduction

This clause describes the format of the parameters needed to access the Multimedia Broadcast/Multicast service. For further information on the use of the parameters see 3GPP TS 23.246 [52].

15.2 Structure of TMGI

Temporary Mobile Group Identity (TMGI) is used ~~for~~within MBMS to uniquely identify Multicast and Broadcast bearer services. ~~notification purpose~~. ~~The BM-SC allocates a globally unique TMGI per MBMS bearer service.~~

The TMGI is composed of three parts:

1) MBMS Service ID consisting of three octets. MBMS Service ID uniquely identifies an MBMS bearer service within a~~the~~ PLMN.

2) Mobile Country Code (MCC) consisting of three digits. The MCC identifies uniquely the country of domicile of the BM-SC;

3) Mobile Network Code (MNC) consisting of two or three digits. The MNC identifies the PLMN which the BM-SC belongs to. The length of the MNC (two or three digits) depends on the value of the MCC.

For more information on the use of the TMGI, see 3GPP TS 23.246 [52].

3GPP TSG-CN WG4 Meeting #26 **N4-050137**
Sydney, AUSTRALIA. 14th to 18th February 2005.

CR-Form-v7.1

CHANGE REQUEST

⌘ **29.060** **CR** **531** ⌘ **rev** **-** ⌘ Current version: **6.7.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Providing the BM-SC with approximate UE location information at MBMS context activation
Source:	⌘	CN4
Work item code:	⌘	MBMS
Date:	⌘	01/02/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one 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)*

Reason for change:	⌘	There are a number of service scenarios where an operator may wish to prevent a user Activating (c.f. joining) an MBMS service when the user is a large distance outside of the MBMS service area. These scenarios will be particularly important to operators in very large countries – and many of these eg China, Australia, and probably America, have networks which use a single PLMN identity. Currently the BM-SC does not receive sufficient information from the GGSN to enable these service scenarios to be realised.
Summary of change:	⌘	At MBMS context activation the full Routeing Area Identity is provided to the BM-SC by the SGSN via the GGSN, as opposed to only the MCC and MNC. It is noted that (eg because of the Iur/RRC connected mode), the RAI provided by the SGSN might not correspond to the cell that the mobile is currently using. It is also noted that subsequent movement of the UE is not reported to the BM-SC.
Consequences if not approved:	⌘	Network operators will be missing an important tool that can be used to optimise customer services/network entity load.

Clauses affected:	⌘					
Other specs affected:	⌘	**Y**	**N**		⌘	
		X		Other core specifications		CR 23.246-141
			X	Test specifications		
			X	O&M Specifications		

Other comments:	⌘ The stage 2 CR was approved at SA2 #44 and is available in TDoc S2-050175.

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.

7.5A.1.5 Create MBMS Context Request

A Create MBMS Context Request shall be sent from an SGSN node to a GGSN node as part of the MBMS Context Activation procedure. After sending the Create MBMS Context Request message, the SGSN marks the MBMS context as 'waiting for response'. A valid request creates a MBMS UE Context within the SGSN and GGSN, (see 3GPP TS 23.246 [26]). Furthermore, a valid request creates a GTP tunnel in the GTP-C plane, however no GTP-U tunnel is created at this step.

The Tunnel Endpoint Identifier Control Plane field specifies a downlink Tunnel Endpoint Identifier for control plane messages which is chosen by the SGSN. The GGSN shall include this Tunnel Endpoint Identifier in the GTP header of all subsequent downlink control plane messages which are related to the requested PDP context.

The MSISDN of the MS is passed to the GGSN inside the Create MBMS Context Request; This additional information can be used when a secure access to a remote application residing on a server is needed. The GGSN would be in fact able to provide the user identity (i.e. the MSISDN) to the remote application server, providing it with the level of trust granted to users through successfully performing the GPRS authentication procedures, without having to re-authenticate the user at the application level.

The IMSI information element together with the NSAPI information element uniquely identifies the PDP context to be created.

The End User Address information element contains the PDP type and IP Multicast PDP address that the UE requires to be activated. The SGSN shall include either the UE provided APN, a subscribed APN or an SGSN selected APN in the message. The Access Point Name information element identifies the access point of packet data network that the UE requires to connect to receive the required MBMS service. The Selection Mode information element shall indicate the origin of the APN in the message. The APN and End User Address information element shall uniquely identify the MBMS service.

The SGSN shall include an SGSN Address for control plane, which may differ from that provided by the underlying network service (e.g. IP). If the GGSN is IPv6 capable, the IPv4/IPv6 capable SGSN shall include IPv6 addresses in the field SGSN Address for signalling. Otherwise, it shall include IPv4 addresses in this field. The GGSN shall store the SGSN Address and use them when sending control plane on this GTP tunnel for the UE.

The SGSN shall include a Recovery information element into the Create MBMS Context Request if the SGSN is in contact with the GGSN for the very first time or if the SGSN has restarted recently and the new Restart Counter value has not yet been indicated to the GGSN or if the SGSN has noticed that the path between itself and the GGSN has failed at some point and has deleted all the active PDP contexts, MBMS UE contexts and MBMS Bearer contexts associated with the GGSN as a result and the new Restart Counter value has not yet been indicated to the GGSN. The GGSN that receives a Recovery information element in the Create MBMS Context Request message element shall handle it in the same way as when receiving an Echo Response message. The Create MBMS Context Request message shall be considered as a valid activation request for the MBMS UE context included in the message.

The SGSN shall include the Routeing Area Identity (RAI) of the SGSN where the UE is registered. The MCC and MNC components shall be populated with the MCC and MNC, respectively, of the SGSN where the UE is registered. The LAC and RAC components shall be populated by the SGSN with the ~~value~~ LAC~~of 'FFFE'~~ and ~~'FF'~~RAC, respectively, of where the UE is located at the time of the MBMS Context invocation.

The optional Private Extension contains vendor or operator specific information.

The MBMS Protocol Configuration Options (MBMS PCO) information element may be included in the request when the MS provides the GGSN with MBMS specific parameters. The SGSN includes this IE in the Create MBMS Context Request if the associated Activate MBMS Context Request from the MS includes MBMS protocol configuration options. The SGSN shall copy the content of this IE transparently from the content of the MBMS PCO IE in the Activate MBMS Context Request message.

Table 7.5A.5: Information Elements in a Create MBMS Context Request

Information element	Presence requirement	Reference
IMSI	Conditional	7.7.2
Routeing Area Identity (RAI)	Mandatory	7.7.3
Recovery	Optional	7.7.11
Selection mode	Conditional	7.7.12
Tunnel Endpoint Identifier Control Plane	Conditional	7.7.14
NSAPI	Mandatory	7.7.17
Trace Reference	Optional	7.7.24
Trace Type	Optional	7.7.25
End User Address	Mandatory	7.7.27
Access Point Name	Mandatory	7.7.30
SGSN Address for signalling	Mandatory	GSN Address 7.7.32
MSISDN	Conditional	7.7.33
Trigger Id	Optional	7.7.41
OMC Identity	Optional	7.7.42
MBMS Protocol Configuration Options	Optional	7.7.58
Private Extension	Optional	7.7.46

3GPP TSG-CN WG4 Meeting #26 **Tdoc N4-050340**

Sydney, Australia, 14th to 18th February 2005.

CR-Form-v7.1

CHANGE REQUEST

⌘ **29.060** **CR** **547** ⌘ **rev** **1** ⌘ Current version: **6.7.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Enhanced NSAPI for MBMS
Source:	⌘	CN4
Work item code:	⌘	MBMS
Date:	⌘	20/01/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
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Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

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R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*
Rel-7	*(Release 7)*

Reason for change:	⌘	The MBMS UE Contexts contains among other parameters the MBMS NSAPI which is chosen by the UE during the MBMS Multicast Service Activation procedure. With the ordinary NSAPI only a maximum of 11 MBMS contexts can be simultaneously activated, which also have to be shared by ordinary PDP context. CN1has agreed on the CR 908 r1 to 24.008, where a new IE is defined, the 'Enhanced NSAPI', intended to be used exclusively for MBMS. The UE allocates an unused NSAPI value from the new enhanced IE value space when activating a new MBMS UE context.
Summary of change:	⌘	The new Enhanced NSAPI has been subtituted for the NSAPI for the MBMS Context Activation. Changes are made to the MBMS UE context and to the GTP messages: 7.5A.1.5 Create MBMS Context Request, 7.5A.1.7 Update MBMS Context Request, 7.5A.1.9 Delete MBMS Context Request. A new IE "Enhanced NSAPI" was added. Several clean ups was made where "MBMS Context" was changed to "MBMS UE Context".
Consequences if not approved:	⌘	Misalignment with 24.008 specification.

Clauses affected:	⌘	3.1, 7.5A.1.3, 7.5A.1.5, 7.5A.1.6, 7.5A.1.7, 7.5A.1.8, 7.5A.1.9, 7.5A.1.10, 7.7, 7.7.xxx, 7.7.55

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

Start of modifications

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

Enhanced Network Service Access Point Identifier (Enhanced NSAPI): integer value in the range [128; 255], identifying a certain Multimedia Broadcast/Multicast Service (MBMS) UE Context.

G-PDU: is a user data message, It consists of a T-PDU plus a GTP header

GTP Tunnel: in the GTP-U plane is defined for each PDP Context or each MBMS service in the GSNs and/or each RAB in the RNC. A GTP tunnel in the GTP-C plane is defined for all PDP Contexts with the same PDP address and APN (for Tunnel Management messages and UE Specific MBMS message), for each MBMS service (for Service Specific MBMS messages) or for each MS (for other types of messages). A GTP tunnel is identified in each node with a TEID, an IP address and a UDP port number. A GTP tunnel is necessary to forward packets between an external packet data network and an MS user.

MBMS Bearer Context: contains all information describing a particular MBMS bearer service.

MBMS UE Context: contains UE-specific information related to a particular MBMS service that the UE has joined.

MM Context: information sets held in MS and GSNs for a GPRS subscriber related to Mobility Management (MM) (please refer to the MM Context Information Element)

Network Service Access Point Identifier (NSAPI): integer value in the range [0; 15], identifying a certain PDP Context. It identifies a PDP context belonging to a specific MM Context ID

path: UDP/IP path is used to multiplex GTP tunnels

Path Protocol: protocol used as a bearer of GTP between GSNs or between a GSN and a RNC

Packet Data Protocol (PDP): network protocol used by an external packet data network interfacing to GPRS

PDP Context: information sets held in MS and GSNs for a PDP address (please refer to the PDP Context Information Element)

Quality of Service (QoS): may be applicable for the GPRS backbone and the Iu interface if the path media supports it Separate paths with different priorities may be defined between a GSN pair or between a GSN and an RNC.

GTP-C Message: GTP-C or control plane messages are exchanged between GSN/RNC pairs in a path
The control plane messages are used to transfer GSN capability information between GSN pairs, to create, update and delete GTP tunnels and for path management.

GTP-U Message: GTP-U or user plane messages are exchanged between GSN pairs or GSN/RNC pairs in a path
The user plane messages are used to carry user data packets, and signalling messages for path management and error indication.

GTP-PDU: GTP Protocol Data Unit is either a GTP-C message or a GTP-U message

Signalling Message: any GTP-PDU except the G-PDU

T-PDU: original packet, for example an IP datagram, from an MS or a network node in an external packet data network A T-PDU is the payload that is tunnelled in the GTP-U tunnel.

Traffic Flow Template (TFTs): used by GGSN to distinguish between different user payload packets and transmit packets with different QoS requirements via different PDP context but to the same PDP address

Tunnel Endpoint IDentifier (TEID): unambiguously identifies a tunnel endpoint in the receiving GTP-U or GTP-C protocol entity
The receiving end side of a GTP tunnel locally assigns the TEID value the transmitting side has to use. The TEID values are exchanged between tunnel endpoints using GTP-C (or RANAP, over the Iu) messages.

UDP/IP Path: connection-less unidirectional or bidirectional path defined by two end-points
An IP address and a UDP port number define an end-point. A UDP/IP path carries GTP messages between GSN nodes, and between GSN and RNC nodes related to one or more GTP tunnels.

Next modifications

7.5A.1.3 MBMS Notification Reject Request

If the MBMS context activation proceeds after the MBMS Notification Response, but the MBMS UE context was not established, due to explicit rejection of the MBMS context Activation Request by the MS, or the MS not responding, or the MS MBMS Bearer Capabilities are insufficient, the SGSN sends a MBMS Notification Reject Request message. The Cause value indicates the reason why the MBMS UE Context could not be established:

- 'MS is not GPRS Responding'.
- 'MS Refuses'.
- 'MS MBMS Capabilities Insufficient'.

When receiving the MBMS Notification Reject Request message the GGSN may, dependent the cause value indicated, and based on operator configuration fall back to IP multicast access as defined in 3GPP TS29.061[27]..

The Tunnel Endpoint Identifier in the GTP header of the MBMS Notification Reject Request message shall be the same as the Tunnel Endpoint Identifier Control Plane information element of the MBMS Notification Request that triggered the reject.

The Tunnel Endpoint Identifier Control Plane information element shall be a tunnel endpoint identifier Control Plane selected by the SGSN and shall be used by the GGSN in the GTP header of the corresponding MBMS Notification Reject Response message.

The End User Address information element contains the PDP type and IP Multicast PDP address that could not be activated. The IP multicast address shall be the one requested by the UE in the Join request.

The Access Point Name shall be the same as the Access Point Name of the received MBMS Notification Request message that triggered the reject.

The NSAPI information element is the NSAPI of the PDP context over which the IGMP/MLD join message was received that triggered the MBMS Notification Request

The optional Private Extension contains vendor or operator specific information.

Table 7.5A.3: Information Elements in a MBMS Notification Reject Request

Information element	Presence requirement	Reference
Cause	Mandatory	7.7.1
Tunnel Endpoint Identifier Control Plane	Mandatory	7.7.14
NSAPI	Mandatory	7.7.17
End User Address	Mandatory	7.7.27
Access Point Name	Mandatory	7.7.30
Private Extension	Optional	7.7.46

Next modifications

7.5A.1.5 Create MBMS Context Request

A Create MBMS Context Request shall be sent from an SGSN node to a GGSN node as part of the MBMS Context Activation procedure. After sending the Create MBMS Context Request message, the SGSN marks the MBMS UE context as 'waiting for response'. A valid request creates a MBMS UE Context within the SGSN and GGSN, (see 3GPP TS 23.246 [26]). Furthermore, a valid request creates a GTP tunnel in the GTP-C plane, however no GTP-U tunnel is created at this step.

The Tunnel Endpoint Identifier Control Plane field specifies a downlink Tunnel Endpoint Identifier for control plane messages which is chosen by the SGSN. The GGSN shall include this Tunnel Endpoint Identifier in the GTP header of all subsequent downlink control plane messages which are related to the requested ~~PDP~~ MBMS UE context.

The MSISDN of the MS is passed to the GGSN inside the Create MBMS Context Request; This additional information can be used when a secure access to a remote application residing on a server is needed. The GGSN would be in fact able to provide the user identity (i.e. the MSISDN) to the remote application server, providing it with the level of trust granted to users through successfully performing the GPRS authentication procedures, without having to re-authenticate the user at the application level.

The IMSI information element together with the Enhanced NSAPI information element uniquely identifies the ~~PDP~~ MBMS UE context to be created.

The End User Address information element contains the PDP type and IP Multicast PDP address that the UE requires to be activated. The SGSN shall include either the UE provided APN, a subscribed APN or an SGSN selected APN in the message. The Access Point Name information element identifies the access point of packet data network that the UE requires to connect to receive the required MBMS service. The Selection Mode information element shall indicate the origin of the APN in the message. The APN and End User Address information element shall uniquely identify the MBMS service.

The SGSN shall include an SGSN Address for control plane, which may differ from that provided by the underlying network service (e.g. IP). If the GGSN is IPv6 capable, the IPv4/IPv6 capable SGSN shall include IPv6 addresses in the field SGSN Address for signalling. Otherwise, it shall include IPv4 addresses in this field. The GGSN shall store the SGSN Address and use them when sending control plane on this GTP tunnel for the UE.

The SGSN shall include a Recovery information element into the Create MBMS Context Request if the SGSN is in contact with the GGSN for the very first time or if the SGSN has restarted recently and the new Restart Counter value has not yet been indicated to the GGSN or if the SGSN has noticed that the path between itself and the GGSN has failed at some point and has deleted all the active PDP contexts, MBMS UE contexts and MBMS Bearer contexts associated with the GGSN as a result and the new Restart Counter value has not yet been indicated to the GGSN. The GGSN that receives a Recovery information element in the Create MBMS Context Request message element shall handle it in the same way as when receiving an Echo Response message. The Create MBMS Context Request message shall be considered as a valid activation request for the MBMS UE context included in the message.

The SGSN shall include the Routeing Area Identity (RAI) of the SGSN where the UE is registered. The MCC and MNC components shall be populated with the MCC and MNC, respectively, of the SGSN where the UE is registered. The LAC and RAC components shall be populated by the SGSN with the value of 'FFFE' and 'FF', respectively.

The optional Private Extension contains vendor or operator specific information.

The MBMS Protocol Configuration Options (MBMS PCO) information element may be included in the request when the MS provides the GGSN with MBMS specific parameters. The SGSN includes this IE in the Create MBMS Context Request if the associated Activate MBMS Context Request from the MS includes MBMS protocol configuration options. The SGSN shall copy the content of this IE transparently from the content of the MBMS PCO IE in the Activate MBMS Context Request message.

Table 7.5A.5: Information Elements in a Create MBMS Context Request

Information element	Presence requirement	Reference
IMSI	Conditional	7.7.2
Routeing Area Identity (RAI)	Mandatory	7.7.3
Recovery	Optional	7.7.11
Selection mode	Conditional	7.7.12
Tunnel Endpoint Identifier Control Plane	Conditional	7.7.14
Enhanced NSAPI	Mandatory	7.7.xx~~17~~
Trace Reference	Optional	7.7.24
Trace Type	Optional	7.7.25
End User Address	Mandatory	7.7.27
Access Point Name	Mandatory	7.7.30
SGSN Address for signalling	Mandatory	GSN Address 7.7.32
MSISDN	Conditional	7.7.33
Trigger Id	Optional	7.7.41
OMC Identity	Optional	7.7.42
MBMS Protocol Configuration Options	Optional	7.7.58
Private Extension	Optional	7.7.46

Next modifications

7.5A.1.6 Create MBMS Context Response

The message shall be sent from a GGSN node to a SGSN node as a response of a Create MBMS Context Request. When the SGSN receives a Create MBMS Context Response with the Cause value indicating 'Request Accepted', the SGSN may be required to register with the GGSN. For further details see MBMS Registration Request procedure.

The Cause value indicates if a MBMS UE context has been created in the GGSN or not. An MBMS UE context has not been created in the GGSN if the Cause differs from 'Request accepted'. Possible Cause values are:

- "Request Accepted".
- "No resources available".
- "No memory is available".
- "Missing or unknown APN".
- "Unknown PDP address or PDP type".
- "User authentication failed".
- "System failure".
- "Mandatory IE incorrect".
- "Mandatory IE missing".
- "Optional IE incorrect".
- "Invalid message format".
- "APN access denied – no subscription".

'No resources available' indicates that not enough resources are available within the network to allow the MBMS UE Context to be created. 'Missing or unknown APN' indicates e.g. when the GGSN does not support the Access Point Name. 'Unknown PDP address or PDP type' indicates when the GGSN does not support the PDP type or the PDP address. Within the scope of MBMS message, an unknown PDP address is considered to be unknown mulitcast address / service.

'User authentication failed' indicates that the external packet network has rejected the service requested by the user. Only the Cause information element shall be included in the response if the Cause contains another value than 'Request accepted'.

All information elements, except Recovery, Charging Gateway Address, Tunnel Endpoint Identifier Control Plane and Private Extension, are mandatory if the Cause contains the value 'Request accepted'.

The Tunnel Endpoint Identifier Control Plane field specifies an uplink Tunnel Endpoint Identifier for control plane messages, which is chosen by the GGSN. The SGSN shall include this Tunnel Endpoint Identifier in the GTP header of all subsequent uplink-control plane messages, which are related to the requested MBMS UE context.

The GGSN shall include a GGSN Address for control plane, which may differ from that provided by the underlying network service (e.g. IP).

If the Create MBMS Context Request received from the SGSN included IPv6 SGSN address, an IPv4/IPv6 capable GGSN shall include IPv6 addresses in the fields GGSN Address for Control Plane, and IPv4 addresses in the fields Alternative GGSN Address for Control Plane. If SGSN included only an IPv4 SGSN address in the request, IPv4/IPv6 capable GGSN shall include IPv4 addresses in the fields GGSN Address for Control Plane and IPv6 addresses in the fields Alternative GGSN Address for Control Plane. The SGSN shall store these GGSN Addresses and use one set of them when sending control plane on this GTP tunnel.

The GGSN shall include the Recovery information element into the Create MBMS Context Response if the GGSN is in contact with the SGSN for the first time or the GGSN has restarted recently and the new Restart Counter value has not

yet been indicated to the SGSN or if the GGSN has noticed that the path between itself and the SGSN has failed at some point and has deleted all the active PDP contexts, MBMS UE contexts and MBMS Bearer contexts associated with the SGSN as a result and the new Restart Counter value has not yet been indicated to the SGSN. The SGSN receiving the Recovery information element shall handle it as when an Echo Response message is received but shall consider the MBMS UE context being created as active if the response indicates successful context activation at the GGSN.

The Charging ID is used to identify all charging records produced in SGSN(s) and the GGSN for this MBMS UE context. The Charging ID is generated by the GGSN and shall be unique within the GGSN.

The Charging Gateway Address is the IP address of the recommended Charging Gateway Functionality to which the SGSN should transfer the Charging Detail Records (CDR) for this MBMS UE Context.

The Alternative Charging Gateway Address IE has a similar purpose as the Charging Gateway Address but enables co-existence of IPv4 and IPv6 stacks in the Ga charging interfaces, without mandating any node to have a dual stack. The format of the optional Alternative Charging Gateway Address information element is the same as the format of the Charging Gateway Address.

When both these addresses are present, the Charging Gateway address IE shall contain the IPv4 address of the Charging Gateway Function and the Alternative Charging Gateway address IE shall contain the IPv6 address of the Charging Gateway Function.

NOTE: The Charging Gateway Address and Alternative Charging Gateway Address both refer to the same Charging Gateway Function.

The optional Private Extension contains vendor or operator specific information.

The MBMS Protocol Configuration Options (MBMS PCO) information element may be included in the response when the GGSN provides the MS with MBMS specific parameters. The SGSN includes this IE in the Activate MBMS Context Accept message if the associated Create MBMS Context Response message from the GGSN includes MBMS protocol configuration options. The SGSN shall copy the content of this IE transparently from the content of the MBMS PCO IE in the Create MBMS Context Response message.

Table 7.5A.6: Information Elements in a Create MBMS Context Response

Information element	Presence requirement	Reference
Cause	Mandatory	7.7.1
Recovery	Optional	7.7.11
Tunnel Endpoint Identifier Control Plane	Conditional	7.7.14
Charging ID	Conditional	7.7.26
GGSN Address for Control Plane	Conditional	GSN Address 7.7.32
Alternative GGSN Address for Control Plane	Conditional	GSN Address 7.7.32
Charging Gateway Address	Optional	7.7.44
Alternative Charging Gateway Address	Optional	7.7.44
MBMS Protocol Configuration Options	Optional	7.7.58
Private Extension	Optional	7.7.46

Next modifications

7.5A.1.7 Update MBMS Context Request

An Update MBMS Context Request message shall be sent from a SGSN to a GGSN as part of the GPRS Inter SGSN Routeing Update procedure or to redistribute contexts due to load sharing. The message shall be sent by the new SGSN at the Inter SGSN Routeing Update procedure. The GGSN shall update the MBMS UE context fields accordingly.

The Enhanced NSAPI information element together with the Tunnel Endpoint Identifier in the GTP header unambiguously identifies a MBMS UE Context in the GGSN.

The IMSI shall be included if the message is sent during an Inter SGSN change when changing the GTP version from GTP v0 to GTP v1; this is required, as the TEID in the header of the message is set to all zeros in this case.

The Tunnel Endpoint Identifier Control Plane field specifies a downlink Tunnel Endpoint Identifier Control Plane messages which is chosen by the SGSN. The GGSN shall include this Tunnel Endpoint Identifier in the GTP header of all subsequent downlink control plane messages that are related to the requested PDP context.

The SGSN shall include an SGSN Address for control plane, which may differ from that provided by the underlying network service (e.g. IP).

If an IPv4/IPv6 capable SGSN received IPv4 GGSN addresses from the old SGSN, it shall include IPv4 addresses in the fields SGSN Address for Control Plane and IPv6 addresses in the fields Alternative SGSN Address for Control Plane. Otherwise, an IPv4/IPv6 capable SGSN shall use only SGSN IPv6 addresses if it has GGSN IPv6 addresses available. If the GGSN supports IPv6 below GTP, it shall store and use the IPv6 SGSN addresses for communication with the SGSN and ignore the IPv4 SGSN addresses. If the GGSN supports only IPv4 below GTP, it shall store and use the IPv4 SGSN addresses for communication with the SGSN and ignore the IPv6 SGSN addresses. When active contexts are being redistributed due to load sharing, G-PDUs that are in transit across the Gn-interface are in an undetermined state and may be lost.

The SGSN shall include a Recovery information element into the Update MBMS Context Request if the SGSN is in contact with the GGSN for the very first time or if the SGSN has restarted recently and the new Restart Counter value has not yet been indicated to the GGSN or if the SGSN has noticed that the path between itself and the GGSN has failed at some point and has deleted all the active PDP contexts, MBMS UE contexts and MBMS Bearer contexts associated with the GGSN as a result and the new Restart Counter value has not yet been indicated to the GGSN. The GGSN that receives a Recovery information element in the Update MBMS Context Request message element shall handle it in the same way as when receiving an Echo Response message. The Update PDP Context Request message shall be considered as a valid update request for the MBMS UE context indicated in the message.

The SGSN shall include Trace Reference, Trace Type, Trigger Id, and OMC Identity in the message if GGSN trace is activated while the MBMS UE context is active. The SGSN shall copy Trace Reference, Trace Type, and OMC Identity from the trace request received from the HLR or OMC.

The SGSN shall include the Routeing Area Identity (RAI) of the SGSN where the UE is registered. The MCC and MNC components shall be populated with the MCC and MNC, respectively, of the SGSN where the UE is registered. The LAC and RAC components shall be populated by the SGSN with the value of 'FFFE' and 'FF', respectively.

The optional Private Extension contains vendor or operator specific information.

Table 7.5A.7: Information Elements in an Update MBMS Context Request

Information element	Presence requirement	Reference
IMSI	Conditional	7.7.2
Routeing Area Identity (RAI)	Mandatory	7.7.3
Recovery	Optional	7.7.11
Tunnel Endpoint Identifier Control Plane	Conditional	7.7.14
Enhanced NSAPI	Mandatory	7.7.xx~~17~~
Trace Reference	Optional	7.7.24
Trace Type	Optional	7.7.25
SGSN Address for Control Plane	Mandatory	GSN Address 7.7.32
Alternative SGSN Address for Control Plane	Conditional	GSN Address 7.7.32
Trigger Id	Optional	7.7.41
OMC Identity	Optional	7.7.42
Private Extension	Optional	7.7.46

Next modifications

7.5A.1.8 Update MBMS Context Response

The message shall be sent from a GGSN node to a SGSN node as a response of an Update MBMS Context Request.

If the SGSN receives an Update MBMS Context Response with a Cause value other than 'Request accepted', it shall abort the update of the MBMS UE context.

If the SGSN receives an Update MBMS Context Response with a Cause value 'Non-existent', it shall delete the ~~UE~~ MBMS UE Context.

Only the Cause information element and optionally the Recovery information element shall be included in the response if the Cause contains another value than 'Request accepted'.

Possible Cause values are:

- 'Request Accepted'.
- 'Non-existent'.
- 'Service not supported'.
- 'System failure'.
- 'Mandatory IE incorrect'.
- 'Mandatory IE missing'.
- 'Optional IE incorrect'.
- 'Invalid message format'.

The Tunnel Endpoint Identifier Control Plane field specifies an uplink Tunnel Endpoint Identifier Control Plane messages which is chosen by the GGSN. The SGSN shall include this Tunnel Endpoint Identifier in the GTP header of all subsequent uplink control plane messages which are related to the requested MBMS UE context.

The GGSN shall also include a GGSN address for control plane, which shall not differ from that provided at MBMS UE context setup time and shall remain unchanged for the lifetime of the MBMS UE context. If the Update MBMS Context Request received from the SGSN included IPv6 SGSN addresses, an IPv4/IPv6 capable GGSN shall include an IPv6 address in the field GGSN Address for Control Plane and a corresponding IPv4 address in the field Alternative GGSN Address for Control Plane. If SGSN included only an IPv4 SGSN address in the request, IPv4/IPv6 capable GGSN shall include IPv4 address for Control plane in the field GGSN Address for Control Plane and IPv6 address for Control plane in the field Alternative GGSN Address for Control Plane.

The GGSN Address for control plane shall be included if the Cause contains the value 'Request accepted'. The Alternative GGSN Address shall be included if the GGSN supports IPv6 below GTP and the Cause contains the value 'Request accepted'.

The GGSN shall include the Recovery information element into the Update MBMS Context Response if the GGSN is in contact with the SGSN for the first time or if the GGSN has restarted recently and the new Restart Counter value has not yet been indicated to the SGSN or if the GGSN has noticed that the path between itself and the SGSN has failed at some point and has deleted all the active PDP contexts, MBMS UE contexts and MBMS Bearer contexts associated with the SGSN as a result and the new Restart Counter value has not yet been indicated to the SGSN. The SGSN receiving the Recovery information element shall handle it as when an Echo Response message is received but shall consider the MBMS UE context as updated and active if the response cause indicates a successful operation at the GGSN.

The Charging ID is used to identify all charging records produced in SGSN(s) and the GGSN for this MBMS UE context. The Charging ID has been previously generated by the GGSN and is unique for this MBMS UE context. If an inter-SGSN routing area update occurs, it is transferred to the new SGSN as part of each active MBMS UE context. This information element shall be included if the Cause contains the value 'Request accepted'.

The Charging Gateway Address is the IP address of the recommended Charging Gateway Functionality to which the SGSN should transfer the Charging Detail Records (CDR) for this MBMS UE Context.

The Alternative Charging Gateway Address IE has a similar purpose as the Charging Gateway Address but enables co-existence of IPv4 and IPv6 stacks in the Ga charging interfaces, without mandating any node to have a dual stack. The format of the optional Alternative Charging Gateway Address information element is the same as the format of the Charging Gateway Address.

When both these addresses are present, the Charging Gateway address IE shall contain the IPv4 address of the Charging Gateway Function and the Alternative Charging Gateway address IE shall contain the IPv6 address of the Charging Gateway Function.

NOTE: The Charging Gateway Address and Alternative Charging Gateway Address both refer to the same Charging Gateway Function.

The optional Private Extension contains vendor or operator specific information.

Table 7.5A.8: Information Elements in an Update MBMS Context Response

Information element	Presence requirement	Reference
Cause	Mandatory	7.7.1
Recovery	Optional	7.7.11
Tunnel Endpoint Identifier Control Plane	Conditional	7.7.14
Charging ID	Conditional	7.7.26
GGSN Address for Control Plane	Conditional	GSN Address 7.7.32
Alternative GGSN Address for Control Plane	Conditional	GSN Address 7.7.32
Charging Gateway Address	Optional	7.7.44
Alternative Charging Gateway Address	Optional	7.7.44
Private Extension	Optional	7.7.46

Next modifications

7.5A.1.9 Delete MBMS Context Request

A Delete MBMS Context Request can be sent either from a SGSN node to a GGSN node as part of the GPRS Detach procedure or from the GGSN node to the SGSN node as part of the MBMS UE Context Deactivation procedure initiated by the UE by the sending of an IGMP/MLD leave message. A Delete MBMS Context Request shall also be sent from an SGSN node to a GGSN node at Inter SGSN change if the new SGSN does not support MBMS. If the deactivation of the MBMS UE context results in no more users being registered within the GSN for the Multicast Service, the SGSN may initiate the MBMS deregistration procedure. (For further information see 3GPP TS 23.246 [26]).

A GSN shall be prepared to receive a Delete MBMS Context Request at any time and shall always reply regardless if the MBMS UE context exists or not. If any collision occurs, the Delete MBMS Context Request takes precedence over any other Tunnel Management message.

An SGSN initiated Delete MBMS Context Request shall only include the ~~NSAPI~~Enhanced NSAPI which shall uniquely identify the MBMS UE context to be deactivated and the optional Private Extension contains vendor or operator specific information.

If the MBMS UE context to be deactivated (indicated by the multicast address within the IGMP/MLD leave message) resides on the same GGSN as which the IGMP/MLD leave message is received, a GGSN initiated Delete MBMS Context Request shall only include the ~~NSAPI~~Enhanced NSAPI which shall uniquely identify the MBMS UE context to be deactivated and the optional Private Extension contains vendor or operator specific information.

If the MBMS UE context to be deactivated (indicated by the multicast address within the IGMP/MLD leave message) resides on a different GGSN from that which the IGMP/MLD leave message is received, a GGSN initiated Delete MBMS Context Request shall contain the IMSI, TEID Control Plane, End User Address, APN, the optional Private Extension contains vendor or operator specific information. This message will then trigger the SGSN to send a SGSN initiated Delete MBMS Context Request for the identified MBMS UE context toward the GGSN hosting the MBMS UE context.

The IMSI shall unambiguously identify the user. The End User Address information element contains the PDP type and IP Multicast PDP address that the GGSN shall request the SGSN to de-activate. The IP multicast address shall be the one included by the UE in the Leave request.

The Access Point Name information element further identifies the access point of packet data network that the SGSN will use to identify which MBMS UE context to deactivate. The APN and End User Address information element shall uniquely identify the MBMS service.

The Tunnel Endpoint Identifier Control Plane information element shall be a tunnel endpoint identifier Control Plane selected by the GGSN and shall be used by the SGSN in the GTP header of the corresponding Delete MBMS Context Response message.

In the MS to GGSN direction, the SGSN includes the MBMS Protocol Configuration Options (MBMS PCO) information element in the request if the MS wishes to provide the GGSN with MBMS specific parameters. The SGSN includes this IE in the Delete MBMS Context Request message if the associated message from the MS includes MBMS protocol configuration options. The SGSN shall copy the content of this IE transparently from the MBMS PCO IE in the Deactivate PDP Context Request message.

In the GGSN to MS direction, the GGSN includes the MBMS Protocol Configuration Options (MBMS PCO) information element in the request if the GGSN wishes to provide the MS with MBMS specific parameters. The SGSN includes this IE in the Deactivate PDP Context Request message if the associated Delete MBMS Context Request message from the GGSN includes MBMS protocol configuration options. The SGSN shall copy the content of this IE transparently from the MBMS PCO IE in the Delete MBMS Context Request message.

Table 7.5A.9: Information Elements in a Delete MBMS Context Request

Information element	Presence requirement	Reference
IMSI	Conditional	7.7.2
Tunnel Endpoint Identifier Control Plane	Conditional	7.7.14
~~NSAPI~~Enhanced NSAPI	Conditional	7.7.xx~~17~~
End User Address	Conditional	7.7.27
Access Point Name	Conditional	7.7.30
MBMS Protocol Configuration Options	Optional	7.7.58
Private Extension	Optional	7.7.46

Next modifications

7.5A.1.10 Delete MBMS Context Response

The message shall be sent as a response to a Delete MBMS Context Request.

A GSN shall ignore a Delete MBMS Context Response for a non-existing MBMS UE context.

If a GSN receives a Delete MBMS Context Request message for a non existing MBMS UE context, it shall send back to the source of the message a Delete MBMS Context Response message with cause value "Non existent". The TEID value used in the response message shall be zero.

Possible Cause values are:

- 'Request Accepted'.
- 'Mandatory IE incorrect'.
- 'Mandatory IE missing'.
- 'Optional IE Incorrect'.
- 'Invalid message format'.
- 'Non existent'.

If the received Delete MBMS Context Response contains a cause value other than 'Request accepted' and 'Non Existent', the PDP context shall be kept active.

The optional Private Extension contains vendor or operator specific information.

In the GGSN to MS direction, the GGSN includes the MBMS Protocol Configuration Options (MBMS PCO) information element in the response if the GGSN wishes to provide the MS with MBMS specific parameters. The SGSN includes this IE in the Deactivate PDP Context Accept message if the associated Delete MBMS Context Response message from the GGSN includes MBMS protocol configuration options. The SGSN shall copy the content of the IE transparently from the MBMS PCO IE in the Delete MBMS Context Response message.

In the MS to GGSN direction, the SGSN includes the MBMS Protocol Configuration Options (MBMS PCO) information element in the response if the MS wishes to provide the GGSN with MBMS specific parameters. The SGSN includes this IE in the Delete MBMS Context Response message if the associated Deactivate PDP Context Accept message from the MS includes MBMS protocol configuration options. The SGSN shall copy the content of the IE transparently from the MBMS PCO IE in the Deactivate PDP Context Accept message.

Table 7.5A.10: Information Elements in a Delete MBMS Context Response

Information element	Presence requirement	Reference
Cause	Mandatory	7.7.1
MBMS Protocol Configuration Options	Optional	7.7.58
Private Extension	Optional	7.7.46

Next modifications

7.7 Information Elements

A GTP Signalling message may contain several information elements. The TLV (Type, Length, Value) or TV (Type, Value) encoding format shall be used for the GTP information elements. The information elements shall be sorted, with the Type fields in ascending order, in the signalling messages. The Length field contains the length of the information element excluding the Type and Length field.

For all the length fields, bit 8 of the lowest numbered octet is the most significant bit and bit 1 of the highest numbered octet is the least significant bit.

Within information elements, certain fields may be described as spare. These bits shall be transmitted with the value defined for them. To allow for future features, the receiver shall not evaluate these bits.

The most significant bit in the Type field is set to 0 when the TV format is used and set to 1 for the TLV format.

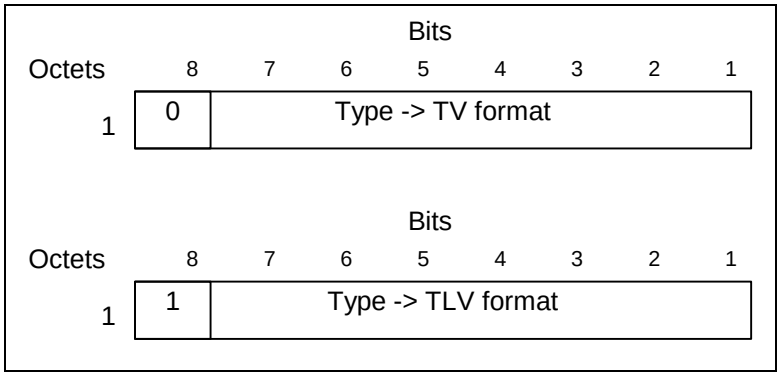

Figure 8: Type field for TV and TLV format

Table 37: Information Elements

IE Type Value	Format	Information Element	Reference
1	TV	Cause	7.7.1
2	TV	International Mobile Subscriber Identity (IMSI)	7.7.2
3	TV	Routeing Area Identity (RAI)	7.7.3
4	TV	Temporary Logical Link Identity (TLLI)	7.7.4
5	TV	Packet TMSI (P-TMSI)	7.7.5
6-7	Spare		
8	TV	Reordering Required	7.7.6
9	TV	Authentication Triplet	7.7.7
10	Spare		
11	TV	MAP Cause	7.7.8
12	TV	P-TMSI Signature	7.7.9
13	TV	MS Validated	7.7.10
14	TV	Recovery	7.7.11
15	TV	Selection Mode	7.7.12
16	TV	Tunnel Endpoint Identifier Data I	7.7.13
17	TV	Tunnel Endpoint Identifier Control Plane	7.7.14
18	TV	Tunnel Endpoint Identifier Data II	7.7.15
19	TV	Teardown Ind	7.7.16
20	TV	NSAPI	7.7.17
21	TV	RANAP Cause	7.7.18
22	TV	RAB Context	7.7.19
23	TV	Radio Priority SMS	7.7.20
24	TV	Radio Priority	7.7.21
25	TV	Packet Flow Id	7.7.22

IE Type Value	Format	Information Element	Reference
26	TV	Charging Characteristics	7.7.23
27	TV	Trace Reference	7.7.24
28	TV	Trace Type	7.7.25
29	TV	MS Not Reachable Reason	7.7.25A
30	TV	Radio Priority LCS	7.7.25B
31	TV	MBMS Session Duration	7.7.59
117-126	Reserved for the GPRS charging protocol (see GTP' in 3GPP TS 32.215 [18])		
127	TV	Charging ID	7.7.26
128	TLV	End User Address	7.7.27
129	TLV	MM Context	7.7.28
130	TLV	PDP Context	7.7.29
131	TLV	Access Point Name	7.7.30
132	TLV	Protocol Configuration Options	7.7.31
133	TLV	GSN Address	7.7.32
134	TLV	MS International PSTN/ISDN Number (MSISDN)	7.7.33
135	TLV	Quality of Service Profile	7.7.34
136	TLV	Authentication Quintuplet	7.7.35
137	TLV	Traffic Flow Template	7.7.36
138	TLV	Target Identification	7.7.37
139	TLV	UTRAN Transparent Container	7.7.38
140	TLV	RAB Setup Information	7.7.39
141	TLV	Extension Header Type List	7.7.40
142	TLV	Trigger Id	7.7.41
143	TLV	OMC Identity	7.7.42
144	TLV	RAN Transparent Container	7.7.43
145	TLV	PDP Context Prioritization	7.7.45
146	TLV	Additional RAB Setup Information	7.7.45A
147	TLV	SGSN Number	7.7.47
148	TLV	Common Flags	7.7.48
149	TLV	APN Restriction	7.7.49
150	TLV	Radio Priority LCS	7.7.25B
151	TLV	RAT Type	7.7.50
152	TLV	User Location Information	7.7.51
153	TLV	MS Time Zone	7.7.52
154	TLV	IMEI(SV)	7.7.53
155	TLV	CAMEL Charging Information Container	7.7.54
156	TLV	MBMS UE Context	7.7.55
157	TLV	Temporary Mobile Group Identity (TMGI)	7.7.56
158	TLV	RIM Routing Address	7.7.57
159	TLV	MBMS Protocol Configuration Options	7.7.58
160	TLV	MBMS Service Area	7.7.60
Xxx	TLV	Enhanced NSAPI	7.7.xxx
239-250	Reserved for the GPRS charging protocol (see GTP' in 3GPP TS 32.215 [18])		
251	TLV	Charging Gateway Address	7.7.44
252-254	Reserved for the GPRS charging protocol (see GTP' in 3GPP TS 32.215 [18])		
255	TLV	Private Extension	7.7.46

Next modifications

7.7.xxx Enhanced NSAPI

The Enhanced NSAPI information element contains an Enhanced NSAPI identifying a MBMS UE Context in a mobility management context specified by the Tunnel Endpoint Identifier Control Plane.

The content and the coding of the Enhanced NSAPI are defined in octet 2 of the Enhanced NSAPI in 3GPP TS 24.008 [5].

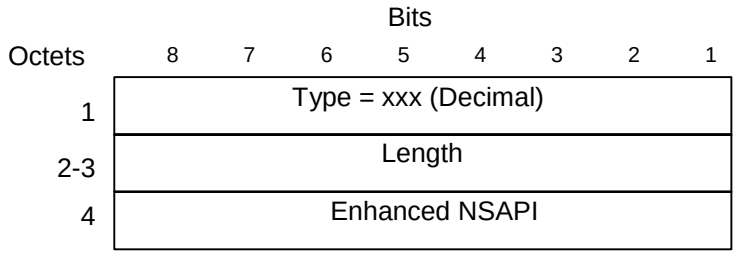

Figure xx: Enhanced NSAPI Information Element

Next modifications

7.7.55 MBMS UE Context

The MBMS UE Context information element contains UE-specific information related to a particular MBMS service that the UE has joined, that are necessary to transfer between SGSNs at the Inter SGSN Routeing Area Update procedure and Inter SGSN SRNS Relocation procedure.

Linked NSAPI is an interger value in the range [0, 15].

The Linked NSAPI identifies the PDP Context used by the UE to carry IGMP/MLD signalling.

Enhanced NSAPI is an integer value in the range [1280; ~~15~~255].

The Enhanced NSAPI points out the affected MBMS UE context.

The Uplink Tunnel Endpoint Identifier Control Plane is the Tunnel Endpoint Identifier used between the old SGSN and the GGSN in up link direction for control plane purpose. It shall be used by the new SGSN within the GTP header of the Update MBMS Context Request message.

The PDP Type Organisation and PDP Type Number are encoded as in the End User Address information element.

The PDP Address Length represents the length of the PDP Address field, excluding the PDP Address Length octet.

The PDP Address is an octet array with a format dependent on the PDP Type. The PDP Address is encoded as in the End User Address information element.

The GGSN Address Length represents the length of the GGSN Address field, excluding the GGSN Address Length octet.

When forwarding the GGSN address to another SGSN (in the MBMS UE Context IE in Forward Relocation Request or SGSN Context Response message), the IPv4/IPv6 capable SGSN shall include GGSN address according to the IP version capability of the receiving SGSN. Determining the Capability of the receiving SGSN is implementation dependent.

The old SGSN includes the GGSN Address for control plane that it has received from GGSN at MBMS service activation or update. If the new SGSN is IPv6 capable and the old SGSN has IPv6 control plane address of the GGSN available, the old IPv4/IPv6 capable SGSN includes the IPv6 GGSN control plane address in the field GGSN Address for control plane. If the new SGSN is IPv4 only capable or the old SGSN does not have any IPv6 GGSN address for control plane, the old SGSN includes the IPv4 GGSN Address in the field GGSN Address for control plane.

The APN is the Access Point Name in use in the old SGSN.

The Transaction Identifier is the 4 or 12 bit Transaction Identifier used in the 3GPP TS 24.008 [5] Session Management messages which control this MBMS UE Context. If the length of the Transaction Identifier is 4 bit, the second octet shall be set to all zeros. The encoding is defined in 3GPP TS 24.007 [3]. The latest Transaction Identifier sent from SGSN to MS is stored in the MBMS UE context IE.

NOTE: Bit 5-8 of the first octet in the encoding defined in 3GPP TS 24.007 [3] is mapped into bit 1-4 of the first octet in this field.

The spare bits x indicate unused bits that shall be set to 0 by the sending side and which shall not be evaluated by the receiving side.

Octets	Bits 8	7	6	5	4	3	2	1
1	Type = 156 (Decimal)							
2-3	Length							
4	Linked NSAPI				Spare (sent as 0 0 0 0)~~NSAPI~~			
Xxx	Enhanced NSAPI							
5-8	Uplink Tunnel Endpoint Identifier Control Plane							
9	Spare 1 1 1 1				PDP Type Organisation			
10	PDP Type Number							
11	PDP Address Length							
12-	PDP Address [0..63]							
+1	GGSN Address for control plane Length							
(+2)-	GGSN Address for control plane [4..16]							
n+1	APN length							
(n+2)-o	APN							
(o+1)	Spare (sent as 0 0 0 0)				Transaction Identifier			
o+2	Transaction Identifier							

Figure 7.7.55.1: MBMS UE Context Information Element

End of modifications

3GPP TSG-CN WG4 Meeting #26 **Tdoc N4-050341**

Sydney, Australia, 14th to 18th February 2005.

CR-Form-v7.1

CHANGE REQUEST

⌘ **29.060** **CR** **546** ⌘ **rev** **1** ⌘ Current version: **6.7.0** ⌘

*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 **X**

Title:	⌘	Adding missing parameters to the MBMS Session Start Request message
Source:	⌘	CN4
Work item code:	⌘	MBMS
Date:	⌘	20/01/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
- ***F*** *(correction)*
- ***A*** *(corresponds to a correction in an earlier release)*
- ***B*** *(addition of feature),*
- ***C*** *(functional modification of feature)*
- ***D*** *(editorial modification)*

Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one 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)*

Reason for change:	⌘	According to 3GPP TS 23.246 v6.5.0 clauses 5.1.2, 5.1.5, 8.3, an MBMS Session Identifier and a 2G/3G indicator shall be sent from the GGSN to the SGSN in the MBMS Session Start Request message. LSs from RAN2 (R2-050273) and GERAN2 (GP-050573) indicate that an MBMS session Identifier of one octet is needed.
Summary of change:	⌘	MBMS Session Identifier and 2G/3G indicator added to the MBMS Session Start Request message.
Consequences if not approved:	⌘	Misalignment with stage 2 specifications.

Clauses affected:	⌘				
Other specs affected:	⌘	**Y**	**N**		
		Y		Other core specifications	⌘ CRs TS29.061-144, TS29.061-145
			X	Test specifications	
			X	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.

Start of modifications

7.5A.2.5 MBMS Session Start Request

An MBMS Session Start Request message shall only ever be sent by the GGSN, and will be triggered by the BM-SC when it is ready to send data for the indicated MBMS service. An MBMS Session Start Request message may also be triggered by an Error Indication from an SGSN for broadcast mode. An MBMS Session Start Request shall trigger the SGSN to setup the necessary MBMS user plane resources and indicate to the RAN to setup the appropriate radio bearers.

The GGSN shall include a Recovery information element into the MBMS Session Start Request if the GGSN is in contact with the SGSN for the very first time or if the GGSN has restarted recently and the new Restart Counter value has not yet been indicated to the SGSN or if the GGSN has noticed that the path between itself and the SGSN has failed at some point and has deleted all the active PDP contexts, MBMS UE contexts and MBMS Bearer contexts associated with the SGSN as a result and the new Restart Counter value has not yet been indicated to the SGSN. The SGSN that receives a Recovery information element in the MBMS Session Start Request message element shall handle it in the same way as when receiving an Echo Response message. The Session Start Request message shall be considered as a valid activation request for the MBMS Bearer context included in the message.

The optional MBMS Session Duration information element indicates the estimated session duration of the MBMS service data transmission if available. This information is provided by the BM-SC.

The Tunnel Endpoint Identifier Control Plane field specifies an uplink Tunnel Endpoint Identifier for control plane messages that is chosen by the GGSN. The SGSN shall include this Tunnel Endpoint Identifier in the GTP header of all subsequent uplink control plane messages which are related to the MBMS Bearer context.

The GGSN shall include a GGSN Address for control plane, which may differ from that provided by the underlying network service (e.g. IP). The SGSN shall store the GGSN Address and use it when sending control plane messages on this GTP tunnel for the MBMS Bearer context.

The Tunnel Endpoint Identifier Control Plane and GGSN Address for Control Plane shall be included in Broadcast mode. In Multicast mode, the control plane tunnel has already been established at the MBMS Registration.

The End User Address information element contains the PDP type and IP Multicast PDP address of the MBMS service. The Access Point Name information element identifies the access point of packet data network that the GGSN requires to connect to receive the required MBMS service. The APN and End User Address information element shall uniquely identify the MBMS service.

The Quality of Service Profile information element shall be the QoS required from the MBMS bearer.

The MBMS Service Type bit of the Common Flags information element contains explicit information whether the MBMS session is for multicast service or for broadcast service. This information is provided by the BM-SC. If the MBMS Service Type bit of the Common Flags information element is set to 0, then the MBMS session is for multicast service. If the MBMS Service Type bit of the Common Flags information element is set to 1, then the MBMS session is for broadcast service.

The Temporary Mobile Group Identity information element shall be the TMGI allocated by the BM-SC.

The MBMS Service Area information element indicates the area over which the MBMS service has to be distributed. This information is provided by the BM-SC.
The MBMS Session Identifier shall be forwarded to the SGSN if it is provided by the BM-SC.
The MBMS 2G/3G Indicator is provided by the BM-SC and informs the SGSN whether the MBMS Session Start Request message shall be forwarded to the BSCs and/or the RNCs.
The optional Private Extension contains vendor or operator specific information.

Table 7.5A.2.5: Information Elements in an MBMS Session Start Request

Information element	Presence requirement	Reference
Recovery	Optional	7.7.11
Tunnel Endpoint Identifier Control Plane	Conditional	7.7.14
End User Address	Mandatory	7.7.27
Access Point Name	Mandatory	7.7.30
GGSN Address for Control Plane	Conditional	GSN Address 7.7.32
Quality of Service Profile	Mandatory	7.7.34
Common Flags	Mandatory	7.7.48
Temporary Mobile Group Identity (TMGI)	Mandatory	7.7.56
MBMS Session Duration	Optional	7.7.59
MBMS Service Area	Mandatory	7.7.60
MBMS Session Identifier	Optional	7.7.X
MBMS 2G/3G Indicator	Mandatory	7.7.Y
Private Extension	Optional	7.7.46

Next modification

7.7 Information Elements

A GTP Signalling message may contain several information elements. The TLV (Type, Length, Value) or TV (Type, Value) encoding format shall be used for the GTP information elements. The information elements shall be sorted, with the Type fields in ascending order, in the signalling messages. The Length field contains the length of the information element excluding the Type and Length field.
For all the length fields, bit 8 of the lowest numbered octet is the most significant bit and bit 1 of the highest numbered octet is the least significant bit.
Within information elements, certain fields may be described as spare. These bits shall be transmitted with the value defined for them. To allow for future features, the receiver shall not evaluate these bits.
The most significant bit in the Type field is set to 0 when the TV format is used and set to 1 for the TLV format.

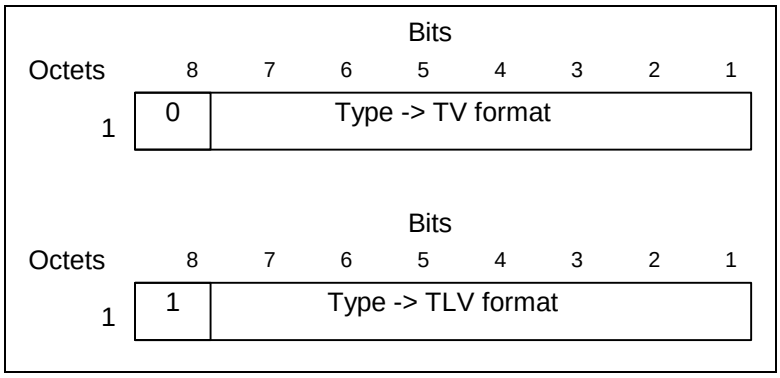

Figure 8: Type field for TV and TLV format

Table 37: Information Elements

IE Type Value	Format	Information Element	Reference
1	TV	Cause	7.7.1
2	TV	International Mobile Subscriber Identity (IMSI)	7.7.2
3	TV	Routeing Area Identity (RAI)	7.7.3
4	TV	Temporary Logical Link Identity (TLLI)	7.7.4
5	TV	Packet TMSI (P-TMSI)	7.7.5
6-7	Spare		
8	TV	Reordering Required	7.7.6
9	TV	Authentication Triplet	7.7.7
10	Spare		
11	TV	MAP Cause	7.7.8
12	TV	P-TMSI Signature	7.7.9
13	TV	MS Validated	7.7.10
14	TV	Recovery	7.7.11
15	TV	Selection Mode	7.7.12
16	TV	Tunnel Endpoint Identifier Data I	7.7.13
17	TV	Tunnel Endpoint Identifier Control Plane	7.7.14
18	TV	Tunnel Endpoint Identifier Data II	7.7.15
19	TV	Teardown Ind	7.7.16
20	TV	NSAPI	7.7.17
21	TV	RANAP Cause	7.7.18
22	TV	RAB Context	7.7.19
23	TV	Radio Priority SMS	7.7.20
24	TV	Radio Priority	7.7.21
25	TV	Packet Flow Id	7.7.22
26	TV	Charging Characteristics	7.7.23
27	TV	Trace Reference	7.7.24
28	TV	Trace Type	7.7.25
29	TV	MS Not Reachable Reason	7.7.25A
30	TV	Radio Priority LCS	7.7.25B
31	TV	MBMS Session Duration	7.7.59
117-126	Reserved for the GPRS charging protocol (see GTP' in 3GPP TS 32.215 [18])		
127	TV	Charging ID	7.7.26
128	TLV	End User Address	7.7.27
129	TLV	MM Context	7.7.28
130	TLV	PDP Context	7.7.29
131	TLV	Access Point Name	7.7.30
132	TLV	Protocol Configuration Options	7.7.31
133	TLV	GSN Address	7.7.32
134	TLV	MS International PSTN/ISDN Number (MSISDN)	7.7.33
135	TLV	Quality of Service Profile	7.7.34
136	TLV	Authentication Quintuplet	7.7.35
137	TLV	Traffic Flow Template	7.7.36

IE Type Value	Format	Information Element	Reference
138	TLV	Target Identification	7.7.37
139	TLV	UTRAN Transparent Container	7.7.38
140	TLV	RAB Setup Information	7.7.39
141	TLV	Extension Header Type List	7.7.40
142	TLV	Trigger Id	7.7.41
143	TLV	OMC Identity	7.7.42
144	TLV	RAN Transparent Container	7.7.43
145	TLV	PDP Context Prioritization	7.7.45
146	TLV	Additional RAB Setup Information	7.7.45A
147	TLV	SGSN Number	7.7.47
148	TLV	Common Flags	7.7.48
149	TLV	APN Restriction	7.7.49
150	TLV	Radio Priority LCS	7.7.25B
151	TLV	RAT Type	7.7.50
152	TLV	User Location Information	7.7.51
153	TLV	MS Time Zone	7.7.52
154	TLV	IMEI(SV)	7.7.53
155	TLV	CAMEL Charging Information Container	7.7.54
156	TLV	MBMS UE Context	7.7.55
157	TLV	Temporary Mobile Group Identity (TMGI)	7.7.56
158	TLV	RIM Routing Address	7.7.57
159	TLV	MBMS Protocol Configuration Options	7.7.58
160	TLV	MBMS Service Area	7.7.60
Yyy	TLV	MBMS 2G/3G Indicator	7.7.y
Xxx	TLV	MBMS Session Identifier	7.7.x
239-250	Reserved for the GPRS charging protocol (see GTP' in 3GPP TS 32.215 [18])		
251	TLV	Charging Gateway Address	7.7.44
252-254	Reserved for the GPRS charging protocol (see GTP' in 3GPP TS 32.215 [18])		
255	TLV	Private Extension	7.7.46

Next modification

7.7.X MBMS Session Identifier

The MBMS Session Identifier information element contains a Session Identifier allocated by the BM-SC. The MBMS Session Identifier value part consists of 1 octet. The content and the coding are defined in 3GPP TS 29.061 [27].

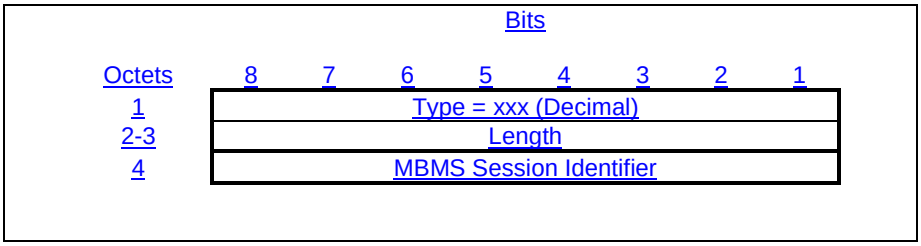

Figure 7.7.X.1: MBMS Session Identifier

7.7.Y MBMS 2G/3G Indicator

The MBMS 2G/3G Indicator information element is provided by the BM-SC. It informs the SGSN to perform the session start procedure towards 2G or 3G radio networks, or both. The possible values are:

0 – 2G only.
1 – 3G only.
2 – both 2G and 3G.

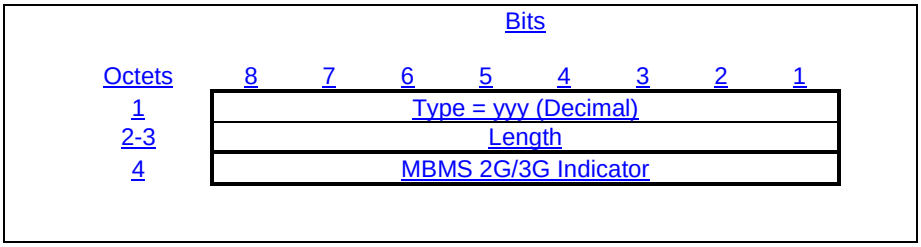

Figure 7.7.Y.1: MBMS 2G/3G Indicator

End of modifications

3GPP TSG-CN WG4 Meeting #26 **N4-050342**
Sydney, AUSTRALIA. 14th to 18th February 2005.

CR-Form-v7.1

CHANGE REQUEST

⌘ **29.060** **CR** **549** ⌘ **rev** **-** ⌘ Current version: **6.7.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Change of newly added IEs in Rel 6 to type TLV
Source:	⌘	CN4
Work item code:	⌘	TEI6
Date:	⌘	15/02/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one 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)*

Reason for change:	⌘	To prevent a similar problem to the one discussed in N4-050039 from re-occurring, it has been decided in CN4 #26 that all new IEs added to GTP shall be of type TLV, rather than TV, regardless of whether or not they currently only appear in messages added in Rel-6. This therefore also allows these particular IEs to be re-used in the future, if need be, in messages that were present in GTP previous to Rel-6.
Summary of change:	⌘	The "MBMS Session Duration" IE is changed from type TV to TLV. Note that this incurs the tag value to be re-assigned.
Consequences if not approved:	⌘	The stated IEs will not be able to be used in other messages in the future (i.e. after Rel-6). Also, in the worse case, another future Denial of Service to the subscriber, similar to that discussed in N4-040039 could occur.

Clauses affected:	⌘	7.7, 7.7.59

		Y	N		
Other specs affected:	⌘		X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	

Other comments:	⌘	

How to create CRs using this form:
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****** First Modified Section ******

7 GTP Messages and Message Formats

. . .

7.7 Information Elements

A GTP Signalling message may contain several information elements. The TLV (Type, Length, Value) or TV (Type, Value) encoding format shall be used for the GTP information elements. The information elements shall be sorted, with the Type fields in ascending order, in the signalling messages. The Length field contains the length of the information element excluding the Type and Length field.

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The most significant bit in the Type field is set to 0 when the TV format is used and set to 1 for the TLV format.

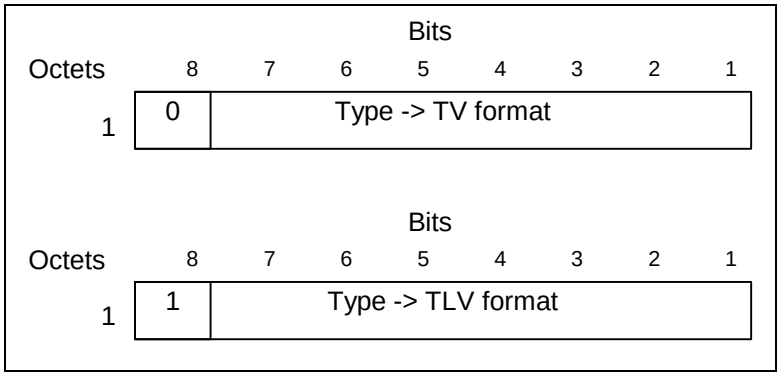

Figure 8: Type field for TV and TLV format

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5	TV	Packet TMSI (P-TMSI)	7.7.5
6-7	Spare		
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10	Spare		
11	TV	MAP Cause	7.7.8
12	TV	P-TMSI Signature	7.7.9
13	TV	MS Validated	7.7.10
14	TV	Recovery	7.7.11
15	TV	Selection Mode	7.7.12
16	TV	Tunnel Endpoint Identifier Data I	7.7.13
17	TV	Tunnel Endpoint Identifier Control Plane	7.7.14
18	TV	Tunnel Endpoint Identifier Data II	7.7.15

IE Type Value	Format	Information Element	Reference
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22	TV	RAB Context	7.7.19
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24	TV	Radio Priority	7.7.21
25	TV	Packet Flow Id	7.7.22
26	TV	Charging Characteristics	7.7.23
27	TV	Trace Reference	7.7.24
28	TV	Trace Type	7.7.25
29	TV	MS Not Reachable Reason	7.7.25A
30	TV	Radio Priority LCS	7.7.25B
~~31~~	~~TV~~	~~MBMS Session Duration~~	~~7.7.59~~
117-126	Reserved for the GPRS charging protocol (see GTP' in 3GPP TS 32.215 [18])		
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129	TLV	MM Context	7.7.28
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133	TLV	GSN Address	7.7.32
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135	TLV	Quality of Service Profile	7.7.34
136	TLV	Authentication Quintuplet	7.7.35
137	TLV	Traffic Flow Template	7.7.36
138	TLV	Target Identification	7.7.37
139	TLV	UTRAN Transparent Container	7.7.38
140	TLV	RAB Setup Information	7.7.39
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142	TLV	Trigger Id	7.7.41
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144	TLV	RAN Transparent Container	7.7.43
145	TLV	PDP Context Prioritization	7.7.45
146	TLV	Additional RAB Setup Information	7.7.45A
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152	TLV	User Location Information	7.7.51
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154	TLV	IMEI(SV)	7.7.53
155	TLV	CAMEL Charging Information Container	7.7.54
156	TLV	MBMS UE Context	7.7.55
157	TLV	Temporary Mobile Group Identity (TMGI)	7.7.56
158	TLV	RIM Routing Address	7.7.57
159	TLV	MBMS Protocol Configuration Options	7.7.58
160	TLV	MBMS Service Area	7.7.60
yy	TLV	MBMS Session Duration	7.7.59
239-250	Reserved for the GPRS charging protocol (see GTP' in 3GPP TS 32.215 [18])		
251	TLV	Charging Gateway Address	7.7.44
252-254	Reserved for the GPRS charging protocol (see GTP' in 3GPP TS 32.215 [18])		
255	TLV	Private Extension	7.7.46

****** Last Modified Section ******

7.7.59 MBMS Session Duration

The MBMS Session Duration information element indicates the estimated session duration of the MBMS service data transmission if available. The time is indicated in seconds.

	Bits							
Octets	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**
1	Type = 31yy (Decimal)							
2-3	Length = 4 (Decimal)							
42-75	MBMS Session Duration							

Figure 7.7.59.1: MBMS Session Duration Information Element