3GPP TSG CN Plenary Meeting #26 **NP-040540**
8th – 10th December 2004 Athens, Greece.

Source: TSG CN WG4

Title: Corrections on MBMS

Agenda item: 9.8

Document for: APPROVAL

Spec	CR	Rev	Doc-2nd-Level N4-040	Phase	Subject	Cat	Ver_C
29.060	524		1452	Rel-6	GTP-C tunnel for MBMS broadcast	F	6.6.0
29.060	514	1	1657	Rel-6	Addition of IEs to MBMS Session Start Request message	F	6.6.0
29.060	515	1	1658	Rel-6	Introduction of MBMS support indication between SGSNs	F	6.6.0

3GPP TSG-CN WG4 Meeting #25
Seoul, Korea, 15 – 19 November 2004

Tdoc ⌘N4-041452

CR-Form-v7

CHANGE REQUEST

⌘ **29.060** **CR** 524 ⌘**rev** **-** ⌘ Current version: 6.6.0 ⌘

*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:	⌘	GTP-C tunnel for MBMS broadcast
Source:	⌘	CN4
Work item code:	⌘	MBMS
Date:	⌘	15/11/2004
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:

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:	⌘	A GTP-C tunnel is needed for the MBMS Bearer Context for broadcast mode. SGSN needs the tunnel to send MBMS Session Start Response and MBMS Session Stop Response, GGSN needs the tunnel for sending MBMS Session Stop Request. The tunnel is also needed for the Restart Counter mechanism at restart.
Summary of change:	⌘	GGSN Control Plane IP Address + TEID are added to MBMS Session Start and MBMS Session Start Response.
Consequences if not approved:	⌘	The MBMS specification is not complete.

Clauses affected:	⌘	7.5A.2.5, 7.5A.2.6

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

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downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

First modification

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

~~It should be noted that due to the asymmetrical nature of MBMS service, the TEID or GGSN address need not to be included in this message.~~

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
Temporary Mobile Group Identity (TMGI)	Mandatory	7.7.56
Private Extension	Optional	7.7.46

Next modification

7.5A.2.6 MBMS Session Start Response

An MBMS Session Start Response is sent by an SGSN in response to a received MBMS Session Start Request. When the GGSN receives a MBMS Session Start Response with the Cause value indicating 'Request Accepted', the GGSN shall mark the MBMS Bearer Context as Active, and may start to forward T-PDUs to the SGSN using the indicated TEID and SGSN Address.

The procedure has not been successful if the Cause differs from 'Request accepted'. Possible Cause values are:

- "Request Accepted".
- "Context not found"
- "No resources available".
- "No memory is available".
- "System failure".
- "Mandatory IE incorrect".
- "Mandatory IE missing".
- "Optional IE incorrect".
- "Invalid message format".

'No resources available' indicates that not enough resources are available within the network to allow the MBMS Bearer to be created.

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

The SGSN shall include the Recovery information element into the MBMS Session Start Response if the SGSN is in contact with the GGSN for the first time or 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 receiving the Recovery information element shall handle it as when an Echo Response message is received but shall consider the MBMS Bearer context being activated if the response indicates successful context activation at the SGSN.

The Tunnel Endpoint Identifier for Data (I) field specifies an downlink Tunnel Endpoint Identifier for G-PDUs that is chosen by the SGSN. The GGSN shall include this Tunnel Endpoint Identifier in the GTP header of all subsequent downlink G-PDUs which are related to the MBMS Bearer context.

The SGSN shall include an SGSN address for user traffic, which may differ from that provided by the underlying network service (e.g. IP). The GGSN shall store these SGSN Addresses and use them when G-PDUs to the SGSN for the MBMS Bearer c~~C~~ontext.

The Tunnel Endpoint Identifier Control Plane field specifies a downlink Tunnel Endpoint Identifier for control plane messages that 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 MBMS Bearer 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). The GGSN shall store the SGSN 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 SGSN 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 optional Private Extension contains vendor or operator specific information.

Table 7.5A.2.6: Information Elements in MBMS Session Start Response

Information element	Presence requirement	Reference
Cause	Mandatory	7.7.1
Recovery	Optional	7.7.11
Tunnel Endpoint Identifier Data I	Conditional	7.7.13
Tunnel Endpoint Identifier Control Plane	Conditional	7.7.14
SGSN Address for Control Plane	Conditional	GSN Address 7.7.32
SGSN Address for user traffic	Conditional	GSN Address 7.7.32
Private Extension	Optional	7.7.46

End Modification

3GPP TSG-CN WG4 Meeting #25 ***N4-041657***

Seoul, KOREA. 15th to 19th November 2004.

CR-Form-v7.1

CHANGE REQUEST

⌘ **29.060** **CR** **514** ⌘ **rev** **1** ⌘ Current version: **6.6.0** ⌘

*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:	⌘	Addition of IEs to MBMS Session Start Request message
Source:	⌘	CN4
Work item code:	⌘	MBMS
Date:	⌘	18/11/2004
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
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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: ⌘

- SA2 has requested in an LS to CN4 that MBMS session start contain explicit information whether the session is for multicast service or for broadcast service (N4-040907). Therefore, an IE which indicates the type of MBMS service is needed in the MBMS Session Start Request message. CN3 has already approved the addition of MBMS-Service-Type AVP on the Gmb interface (N3-040634: TS 29.061 CR129).
- Stage2 specification (TS 23.246) states that session attributes such as service area and if available, session duration be provided to GGSN(s) and SGSN(s) in MBMS session start procedure. Since such information are missing in MBMS Session Start Request message, new IEs are needed. MBMS-Service-Area and MBMS-Session-Duration AVPs are already defined on the Gmb interface (TS 29.061).
- Additional correction: Radio Priority LCS IE is defined to hold two IE Type Values, 30 and 150. According to the already approved 29.060 CR493, IE Type Value 30 needs to be deleted.

Summary of change: ⌘

- The following IEs are added to MBMS Session Start Request message:
  - 'MBMS Session Duration' (new)
  - 'Common Flags'
  - 'MBMS Service Area' (new)
- MBMS Service Type bit field is added to the Common Flags IE.
- IE Type Value 30 in Table 37 is deleted.

Consequences if not approved: ⌘

- Misalignments with stage 2 specification (TS 23.246) and CN3 specification (TS 29.061 including CR129) remain.

	• RAN will not be able to receive information regarding the type, service area, and session duration of the MBMS service. • Two IE Type Values for Radio Priority LCS IE remain.

Clauses affected:	⌘	7.5A.2.5, 7.7, 7.7.x, 7.7.48, 7.7.y			
Other specs affected:	⌘	**Y**	**N**		
			X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

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====== FIRST MODIFIED SECTION =====

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 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.

It should be noted that due to the asymmetrical nature of MBMS service, the TEID or GGSN address need not to be included in this message.

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
MBMS Session Duration	Optional	7.7.x
End User Address	Mandatory	7.7.27
Access Point Name	Mandatory	7.7.30
Quality of Service Profile	Mandatory	7.7.34
Common Flags	Mandatory	7.7.48
Temporary Mobile Group Identity (TMGI)	Mandatory	7.7.56
MBMS Service Area	Mandatory	7.7.y
Private Extension	Optional	7.7.46

====== SECOND MODIFIED SECTION =====

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.

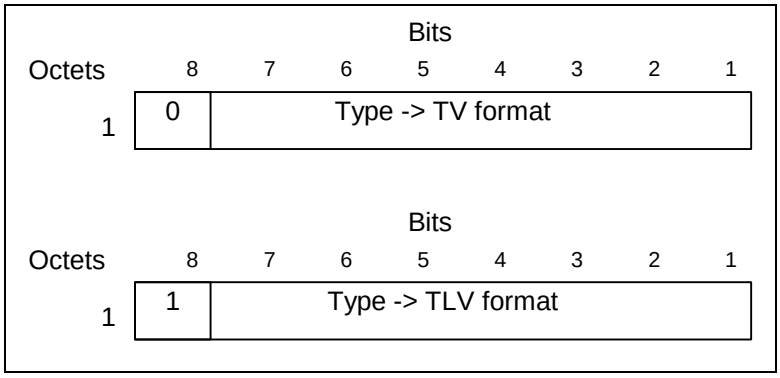

Figure 8: Type field for TV and TLV format

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

IE Type Value	Format	Information Element	Reference
27	TV	Trace Reference	7.7.24
28	TV	Trace Type	7.7.25
29	TV	MS Not Reachable Reason	7.7.25A
xxx	TV	MBMS Session Duration	7.7.x
~~30~~	~~TV~~	~~Radio Priority LCS~~	~~7.7.25B~~
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
yyy	TLV	MBMS Service Area	7.7.y
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

====== THIRD MODIFIED SECTION =====

7.7.x 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.

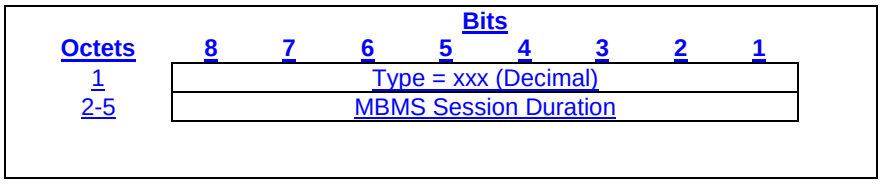

Figure xx: MBMS Session Duration Information Element

====== FOURTH MODIFIED SECTION =====

7.7.48 Common Flags

The Common Flags ~~optional~~ information element is used to hold values for multiple bit flags.

The Prohibit Payload Compression bit field is relevant only for A/Gb mode access and is used to determine whether or not an SGSN should attempt to compress the payload of user data when the users asks for it to be compressed.

The MBMS Service Type bit field is relevant only for MBMS session start procedure and is used to determine whether the MBMS session is for multicast service or for broadcast service.

Bits marked as Spare shall be assigned the value 0 by the sending node and shall not be evaluated by the receiving node.

Octets	Bits 8	7	6	5	4	3	2	1
1	Type=148 (Decimal)							
2-3	Length							
4	Spare	Spare	Spare	Spare	Spare	Spare	~~Spare~~MBMS Service Type	Prohibit Payload Compression

Figure 62a: Common Flags Information Element

====== FIFTH MODIFIED SECTION =====

7.7.y MBMS Service Area

The MBMS Service Area information element indicates the area over which the MBMS service has to be distributed.

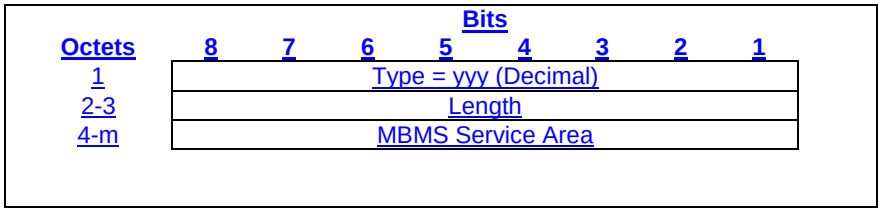

Figure yy: MBMS Service Area Information Element

====== END OF MODIFICATION =====

3GPP TSG-CN WG4 Meeting #25 ***N4-041658***

Seoul, KOREA. 15th to 19th November 2004.

CR-Form-v7.1

CHANGE REQUEST

⌘ **29.060** **CR** **515** ⌘ **rev** **1** ⌘ Current version: **6.6.0** ⌘

*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:	⌘	Introduction of MBMS support indication between SGSNs
Source:	⌘	CN4
Work item code:	⌘	MBMS
Date:	⌘	5/11/2004
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
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Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*
Rel-7	*(Release 7)*

Reason for change: ⌘ This is an alignment of the stage2 CR S2-043294. In that CR, the MBMS bearer service handling has been specified for the case when a UE changes between supporting and non-supporting SGSNs;

- During Inter SGSN RA Update or SRNS Relocation procedure, the new SGSN indicates its MBMS support to the old SGSN. If there is no support the old SGSN deactivates the MBMS UE contexts.

The above change is needed because MBMS support indication in Update PDP Context request cannot accommodate such mobility events between supporting and non-supporting SGSNs when PDP Contexts and MBMS UE contexts are on different GGSNs.

Summary of change: ⌘

- MBMS support indication in Extension headers is changed to be sent in SGSN Context Request and Forward Relocation Response.
- It is clarified that the old SGSN does not include its MBMS UE Contexts in SGSN Context Response if the new SGSN does not support MBMS.
- It is clarified that the SGSN initiates MBMS Context Deactivation at Inter SGSN change if the new SGSN does not support MBMS

Consequences if not approved: ⌘

- Misalignment with stage 2 CR
- The invalid MBMS UE Contexts would be dangling in the network after Inter SGSN change towards the non-supporting SGSN.

Clauses affected: ⌘ 6.1.4, 7.5.4, 7.5A.1.9

Y **N**

Other specs affected:	⌘	X		Other core specifications	⌘ 23.234CR105
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

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

****** First modified section ******

6.1.4 MBMS support indication

This Extension Header shall be included by an SGSN supporting MBMS in all Create PDP Context Request messages ~~and ,in all~~ Update PDP Context Request messages, SGSN Context Request messages and Forward Relocation Response messages.

A GGSN supporting MBMS receiving this Extension Header in a Create PDP Context Request or in an Update PDP Context Request shall assume the SGSN originating the message supports MBMS in the handling of all subsequent MBMS-related procedures. If this Extension Header is not received in a Create PDP Context Request or in an Update PDP Context Request, then the GGSN shall assume that the SGSN originating the message does not support MBMS in the handling of all subsequent MBMS-related procedures.

An SGSN supporting MBMS receiving this Extension Header in an SGSN Context Request or in a Forward Relocation Response shall assume the SGSN originating the message supports MBMS in the handling of all subsequent MBMS-related procedures. If this Extension Header is not received in a SGSN Context Request or in a Forward Relocation Response, then the receiving SGSN shall deactivate the associated MBMS UE Contexts.

	Bits							
Octets	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**
1	1							
2	0xFF							
3	0xFF							
4	Next Extension Header Type (note)							

NOTE: The value of this field is 0 if no other Extension header follows.

Figure 8A: MBMS support indication Extension Header

****** Second modified section ******

7.5.4 SGSN Context Response

The old SGSN shall send an SGSN Context Response to the new SGSN as a response to a previous SGSN Context Request.

Possible Cause values are:

- 'Request Accepted'.
- 'IMSI not known'.
- 'System failure'.
- 'Mandatory IE incorrect'.
- 'Mandatory IE missing'.
- 'Optional IE incorrect'.
- 'Invalid message format'.

- 'P-TMSI Signature mismatch'.

If the Cause contains the value 'Request accepted', all information elements are mandatory, except PDP Context, MBMS UE Context, RAB Context and Private Extension.

If the Cause contains the value 'P-TMSI Signature mismatch' the IMSI information element and, for Intra Domain Connection of RAN Nodes to Multiple CN Nodes, a SGSN Address for control plane shall be included in the response, otherwise only the Cause information element shall be included in the response.

The old SGSN shall include a SGSN Address for control plane. The new SGSN shall store this SGSN Address and use it when sending control plane messages for the MS to the old SGSN in the SGSN context transfer procedure.

The Tunnel Endpoint Identifier Control Plane field specifies a Tunnel Endpoint Identifier, which is chosen by the old SGSN. The new SGSN shall include this Tunnel Endpoint Identifier in the GTP header of all subsequent control plane messages, which are sent from the new SGSN to the old SGSN and related to the PDP context(s) requested.

The IMSI information element contains the IMSI matching the TLLI or P-TMSI (for GSM or UMTS respectively) and RAI in the SGSN Context Request.

The MM Context contains necessary mobility management and security parameters. An SGSN supporting the 'PUESBINE' feature (see 3GPP TS 23.195 [25] for more information) or the ADD feature (see 3GPP TS 22.101 [29] for more information) shall include the IMEISV in the MM Context when transferring the IMEISV from the old SGSN to the new SGSN.

All active PDP contexts in the old SGSN shall be included as PDP Context information elements. The PDP contexts are included in an implementation dependant prioritized order, and the most important PDP context is placed first. When the PDP Context Prioritization IE is included, it informs the new SGSN that the PDP contexts are sent prioritized. If the new SGSN is not able to maintain active all the PDP contexts received from the old SGSN when it is indicated that prioritization of the PDP contexts is applied, the new SGSN should use the prioritisation sent by old SGSN as input when deciding which PDP contexts to maintain active and which ones to delete.

If there is at least one active PDP context, the old SGSN shall start the T3-TUNNEL timer and store the address of the new SGSN in the "New SGSN Address" field of the MM context. The old SGSN shall wait for SGSN Context Acknowledge before sending T-PDUs to the new SGSN. If an SGSN Context Acknowledge message is not received within a time defined by T3-RESPONSE, the old SGSN shall retransmit the SGSN Context Response to the new SGSN as long as the total number of attempts is less than N3-REQUESTS. After N3-REQUESTS unsuccessfully attempts, the old SGSN shall proceed as described in section 'Reliable delivery of signalling messages' in case the transmission of a control plane message fails N3-REQUESTS times.

For each RAB using lossless PDCP context, the old SGSN shall include a RAB Context. If a RAB Context is included in the SGSN Context Response, the new SGSN shall ignore the N-PDU number fields and sequence number fields received in the PDP Context IE.

Radio Priority SMS contains the radio priority level for MO SMS transmission, and shall be included if a valid Radio Priority SMS value exists for the MS in the old SGSN.

Radio Priority LCS contains the radio priority level for MO LCS transmission, and shall be included if a valid Radio Priority LCS value exists for the MS in the old SGSN.

Radio Priority is the radio priority level that the MS uses when accessing the network for the transmission of uplink user data for a particular PDP context. One Radio Priority IE shall be included per PDP context that has a valid radio priority value assigned to it in the old SGSN.

Packet Flow Id is the packet flow identifier assigned to the PDP context. One Packet Flow Id IE shall be included per PDP context that has a valid packet flow identifier value assigned to it in the old SGSN.

Charging Characteristics IE contains the charging characteristics which apply for a PDP context; see 3GPP TS 32.215 [18]. One Charging Characteristics IE shall be included per PDP context IE. If no PDP context is active, this IE shall not be included. The mapping of a Charging Characteristics IE to a PDP Context IE is done according to the sequence of their appearance, e.g. the first Charging Characteristics IE is mapped to the first PDP Context IE.

All MBMS UE Contexts in the old SGSN shall be included as MBMS UE Context information elements if the new SGSN supports MBMS (i.e. MBMS support indication has been sent from the new SGSN).

The optional Private Extension contains vendor or operator specific information.

Table 27: Information Elements in a SGSN Context Response

Information element	Presence requirement	Reference
Cause	Mandatory	7.7.1
IMSI	Conditional	7.7.2
Tunnel Endpoint Identifier Control Plane	Conditional	7.7.14
RAB Context	Conditional	7.7.19
Radio Priority SMS	Optional	7.7.20
Radio Priority	Optional	7.7.21
Packet Flow Id	Optional	7.7.22
CharingCharacteristics	Optional	7.7.23
Radio Priority LCS	Optional	7.7.25B
MM Context	Conditional	7.7.28
PDP Context	Conditional	7.7.29
SGSN Address for Control Plane	Conditional	7.7.32
PDP Context Prioritization	Optional	7.7.45
MBMS UE Context	Optional	7.7.55
Private Extension	Optional	7.7.46

****** Third modified section ******

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 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 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 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 which shall uniquely identify the MBMS context to be deactivated and the optional Private Extension contains vendor or operator specific information.

If the MBMS 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 which shall uniquely identify the MBMS context to be deactivated and the optional Private Extension contains vendor or operator specific information.

If the MBMS 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 context toward the GGSN hosting the MBMS 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 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	Conditional	7.7.17
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