

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

NP-040526

Source: TSG CN WG4
Title: Corrections on TEI5 GPRS
Agenda item: 8.8
Document for: APPROVAL

Spec	CR	Rev	Doc-2nd-Level N4-040	Phase	Subject	Cat	Ver_C
29.060	519	1	1659	Rel-5	Additional support of IPv4 and IPv6 node addresses in create PDP context procedure	F	5.11.0
29.060	520	1	1660	Rel-6	Additional support of IPv4 and IPv6 node addresses in Create PDP and MBMS context procedures.	F	6.6.0

CHANGE REQUEST

⌘ **29.060 CR 519** ⌘ rev **1** ⌘ Current version: **5.11.0** ⌘

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:	⌘ Additional support of IPv4 and IPv6 node addresses in create PDP context procedure.		
Source:	⌘ CN4		
Work item code:	⌘ TEI5	Date:	⌘ 20/10/2004
Category:	⌘ F	Release:	⌘ REL-5
	Use <u>one</u> of the following categories: F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		Use <u>one</u> of the following releases: <i>Ph2</i> (GSM Phase 2) <i>R96</i> (Release 1996) <i>R97</i> (Release 1997) <i>R98</i> (Release 1998) <i>R99</i> (Release 1999) <i>Rel-4</i> (Release 4) <i>Rel-5</i> (Release 5) <i>Rel-6</i> (Release 6) <i>Rel-7</i> (Release 7)

Reason for change:	⌘ Present GTP specification has supported using IPv6 addresses in communication between IPv4/IPv6 capable SGSN and IPv4/IPv6 capable GGSN, but it has not correctly described how and when SGSN can use appropriate IP version in create PDP context procedure.
Summary of change:	⌘ In create PDP context procedure, the SGSN shall select one GGSN based on the user provided or SGSN selected APN. The GGSN may have a logical name that is converted to an IP address. The conversion may be performed with any name-to-address function. If the GGSN is IPv4/IPv6 capable, IPv6 and IPv4 addresses will be all included in the address list replied from DNS query. The SGSN can decide to use IPv6 addresses in communication with IPv4/IPv6 capable GGSN. If the GGSN don't support IPv6, the converted address will include only IPv4 address, the IPv4/IPv6 capable SGSN will use IPv4 addresses in these procedures. Another correction is that there are two IP addresses to be included in Create PDP context Request message, not one. This is an editorial error. These changes will make SGSN to determine the correct IP version to create PDP context.
Consequences if not approved:	⌘ GPRS interworking between PLMNs in a mixed IPv4/IPv6 scenario will not work.

Clauses affected:	⌘ 7.3.1 7.3.2
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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.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://ftp.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

***** First Modification *****

7.3 Tunnel Management Messages

7.3.1 Create PDP Context Request

A Create PDP Context Request shall be sent from a SGSN node to a GGSN node as a part of the GPRS PDP Context Activation procedure. After sending the Create PDP Context Request message, the SGSN marks the PDP context as 'waiting for response'. In this state the SGSN shall accept G-PDUs from the GGSN but shall not send these G-PDUs to the MS. A valid request initiates the creation of a tunnel between a PDP Context in a SGSN and a PDP Context in a GGSN. If the procedure is not successfully completed, the SGSN repeats the Create PDP Context Request message to the next GGSN address in the list of IP addresses, if there is one. If the list is exhausted the activation procedure fails.

The Tunnel Endpoint Identifier Data I field specifies a downlink Tunnel Endpoint Identifier for G-PDUs which 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 requested PDP context.

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. If the SGSN has already confirmed successful assignment of its Tunnel Endpoint Identifier Control Plane to the peer GGSN, this field shall not be present. The SGSN confirms successful assignment of its Tunnel Endpoint Identifier Control Plane the GGSN when it receives any message with its assigned Tunnel Endpoint Identifier Control Plane in the GTP header from the GGSN.

The MSISDN of the MS is passed to the GGSN inside the Create PDP 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.

If the MS requests a dynamic PDP address and a dynamic PDP address is allowed, then the PDP Address field in the End User Address information element shall be empty. If the MS requests a static PDP Address then the PDP Address field in the End User Address information element shall contain the static PDP Address. In case the PDP addresses carried in the End User Address and optionally in the Protocol Configuration Option information element contain contradicting information, the PDP address carried in the End User Address information element takes the higher precedence. The Quality of Service Profile information element shall be the QoS values to be negotiated between the MS and the SGSN at PDP Context activation.

The SGSN shall include an SGSN Address for control plane and 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 sending control plane on this GTP tunnel or G-PDUs to the SGSN for the MS.

The SGSN shall include a Recovery information element into the Create PDP 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 PDP Context Request message element shall handle it in the same way as when receiving an Echo Response message. The Create PDP Context Request message shall be considered as a valid activation request for the PDP context included in the message.

The SGSN shall include either the MS provided APN, a subscribed APN or an SGSN selected APN in the message; the Access Point Name may be used by the GGSN to differentiate accesses to different external networks.

The Selection Mode information element shall indicate the origin of the APN in the message.

For contexts created by the Secondary PDP Context Activation Procedure the SGSN shall include the linked NSAPI. Linked NSAPI indicates the NSAPI assigned to any one of the already activated PDP contexts for this PDP address and APN.

The Secondary PDP Context Activation Procedure may be executed without providing a Traffic Flow Template (TFT) to the newly activated PDP context if all other active PDP contexts for this PDP address and APN already have an associated TFT, otherwise a TFT shall be provided. TFT is used for packet filtering in the GGSN.

When using the Secondary PDP Context Activation Procedure, the Selection mode, IMSI, MSISDN, End User Address, Access Point Name and APN Restriction information elements shall not be included in the message.

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

The SGSN shall select one GGSN based on the user provided or SGSN selected APN. The GGSN may have a logical name that is converted to an address. The conversion may be performed with any name-to-address function. The converted address shall be stored in the "GGSN Address in Use" field in the PDP context and be used during the entire lifetime of the PDP context.

If the converted address includes an IPv6 address, the IPv4/IPv6 capable SGSN sends Create PDP Context Request to the GGSN including IPv6 addresses in the fields SGSN Address for Control Plane and SGSN Address for user traffic. If the converted address only includes an IPv4 address, IPv4/IPv6 capable SGSN shall include IPv4 addresses in the fields SGSN Address for Control Plane and SGSN Address for user traffic.

NOTE: A DNS query may be used as the name-to-IP address mapping of the GGSN. The IP address returned in the DNS response is then stored in the "GGSN Address in Use" field in the PDP context.

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

The SGSN shall not send a Create PDP Context Request for an already active context.

*** Second Modification ***

7.3.2 Create PDP Context Response

The message shall be sent from a GGSN node to a SGSN node as a response of a Create PDP Context Request. When the SGSN receives a Create PDP Context Response with the Cause value indicating 'Request Accepted', the SGSN activates the PDP context and may start to forward T-PDUs to/from the MS from/to the external data network.

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

- "Request Accepted".
- "Context not found"
- "No resources available".
- "All dynamic PDP addresses are occupied".
- "No memory is available".
- "Missing or unknown APN".
- "Unknown PDP address or PDP type".
- "User authentication failed".
- "System failure".

- "Semantic error in the TFT operation".
- "Syntactic error in the TFT operation".
- "Semantic errors in packet filter(s)".
- "Syntactic errors in packet filters(s)".
- "Mandatory IE incorrect".
- "Mandatory IE missing".
- "Optional IE incorrect".
- "Invalid message format".
- "PDP context without TFT already activated".
- "APN access denied – no subscription".
- "APN Restriction type incompatibility with currently active PDP Contexts"

'No resources available' indicates that not enough resources are available within the network to allow the PDP 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.

'User authentication failed' indicates that the external packet network has rejected the service requested by the user e.g. the authentication check in the RADIUS server failed. 'PDP context without TFT already activated' indicates that a PDP context has already been activated without a TFT for that MS. 'Context not found' indicates that a Create PDP Request for a subsequent PDP context has been received, but the PDP context associated with the request, which the SGSN believes to be active does not exist on the GGSN. 'APN access denied – no subscription' indicates that the GGSN has denied the user access to an APN because a subscription is required, but the subscriber does not have the necessary subscription.

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

All information elements, except Recovery, Protocol Configuration Options, 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 for Data (I) field specifies an uplink Tunnel Endpoint Identifier for G-PDUs that is chosen by the GGSN. The SGSN shall include this Tunnel Endpoint Identifier in the GTP header of all subsequent uplink G-PDUs which are related to the requested PDP context.

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 PDP context. If the GGSN has already confirmed successful assignment of its Tunnel Endpoint Identifier Control Plane to the peer SGSN, this field shall not be present. The GGSN confirms successful assignment of its Tunnel Endpoint Identifier Control Plane to the SGSN when it receives any message with its assigned Tunnel Endpoint Identifier Control Plane in the GTP header from the SGSN.

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

If the Create PDP 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 GGSN Address for user traffic, and IPv4 addresses in the fields Alternative GGSN Address for Control Plane and Alternative GGSN Address for user traffic. If SGSN included ~~only an~~ IPv4 SGSN addresses in the request, IPv4/IPv6 capable GGSN shall include IPv4 addresses in the fields GGSN Address for Control Plane and GGSN Address for user traffic, and IPv6 addresses in the fields Alternative GGSN Address for Control Plane and Alternative GGSN Address for user traffic. The SGSN shall store these GGSN Addresses and use one set of them when sending control plane on this GTP tunnel or G-PDUs to the GGSN for the MS.

CHANGE REQUEST

⌘ 29.060 CR 520 ⌘ 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:	⌘ Additional support of IPv4 and IPv6 node addresses in Create PDP and MBMS context procedures.		
Source:	⌘ HUawei		
Work item code:	⌘ TEI6	Date:	⌘ 20/10/2004
Category:	⌘ F	Release:	⌘ REL-6
	<p>Use <u>one</u> of the following categories:</p> <p>F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP TR 21.900.</p>		<p>Use <u>one</u> of the following releases:</p> <p>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)</p>

Reason for change:	⌘ Present GTP specification has supported using IPv6 addresses in communication between IPv4/IPv6 capable SGSN and IPv4/IPv6 capable GGSN, but it has not correctly described how and when SGSN can use appropriate IP version in create PDP context and create MBMS context procedures.
Summary of change:	⌘ In create PDP context procedure and create MBMS Context procedure, the SGSN shall select one GGSN based on the user provided or SGSN selected APN. The GGSN may have a logical name that is converted to an IP address. The conversion may be performed with any name-to-address function. If the GGSN is IPv4/IPv6 capable, IPv6 and IPv4 addresses will be all included in the address list replied from DNS query. The SGSN can decide to use IPv6 addresses in communication with IPv4/IPv6 capable GGSN. If the GGSN don't support IPv6, the converted address will include only IPv4 address, the IPv4/IPv6 capable SGSN will use IPv4 addresses in these procedures. Another correction is that there are two IP addresses to be included in Create PDP context Request message, not one. This is an editorial error. These changes will make SGSN to determine the correct IP version to create PDP and MBMS context.
Consequences if not approved:	⌘ GPRS interworking between PLMNs in a mixed IPv4/IPv6 scenario will not work.

Clauses affected:	⌘	7.3.1 7.3.2 7.5A1.5										
Other specs affected:	⌘	<table border="1"><tr><td>Y</td><td>N</td></tr><tr><td></td><td>X</td></tr><tr><td></td><td>X</td></tr><tr><td></td><td>X</td></tr></table>	Y	N		X		X		X	Other core specifications	⌘
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	X											
	X											
	Test specifications											
	O&M Specifications											
Other comments:	⌘											

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***** First Modification *****

7.3 Tunnel Management Messages

7.3.1 Create PDP Context Request

A Create PDP Context Request shall be sent from a SGSN node to a GGSN node as a part of the GPRS PDP Context Activation procedure. After sending the Create PDP Context Request message, the SGSN marks the PDP context as 'waiting for response'. In this state the SGSN shall accept G-PDUs from the GGSN but shall not send these G-PDUs to the MS. A valid request initiates the creation of a tunnel between a PDP Context in a SGSN and a PDP Context in a GGSN. If the procedure is not successfully completed, the SGSN repeats the Create PDP Context Request message to the next GGSN address in the list of IP addresses, if there is one. If the list is exhausted the activation procedure fails.

The Tunnel Endpoint Identifier Data I field specifies a downlink Tunnel Endpoint Identifier for G-PDUs which 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 requested PDP context.

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. If the SGSN has already confirmed successful assignment of its Tunnel Endpoint Identifier Control Plane to the peer GGSN, this field shall not be present. The SGSN confirms successful assignment of its Tunnel Endpoint Identifier Control Plane the GGSN when it receives any message with its assigned Tunnel Endpoint Identifier Control Plane in the GTP header from the GGSN.

The MSISDN of the MS is passed to the GGSN inside the Create PDP 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.

If the MS requests a dynamic PDP address and a dynamic PDP address is allowed, then the PDP Address field in the End User Address information element shall be empty. If the MS requests a static PDP Address then the PDP Address field in the End User Address information element shall contain the static PDP Address. In case the PDP addresses carried in the End User Address and optionally in the Protocol Configuration Option information element contain contradicting information, the PDP address carried in the End User Address information element takes the higher precedence. The Quality of Service Profile information element shall be the QoS values to be negotiated between the MS and the SGSN at PDP Context activation.

The SGSN shall include an SGSN Address for control plane and 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 sending control plane on this GTP tunnel or G-PDUs to the SGSN for the MS.

The SGSN shall include a Recovery information element into the Create PDP 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 PDP Context Request message element shall handle it in the same way as when receiving an Echo Response message. The Create PDP Context Request message shall be considered as a valid activation request for the PDP context included in the message.

The SGSN shall include either the MS provided APN, a subscribed APN or an SGSN selected APN in the message; the Access Point Name may be used by the GGSN to differentiate accesses to different external networks.

The Selection Mode information element shall indicate the origin of the APN in the message.

For contexts created by the Secondary PDP Context Activation Procedure the SGSN shall include the linked NSAPI. Linked NSAPI indicates the NSAPI assigned to any one of the already activated PDP contexts for this PDP address and APN.

The Secondary PDP Context Activation Procedure may be executed without providing a Traffic Flow Template (TFT) to the newly activated PDP context if all other active PDP contexts for this PDP address and APN already have an associated TFT, otherwise a TFT shall be provided. TFT is used for packet filtering in the GGSN.

When using the Secondary PDP Context Activation Procedure, the Selection mode, IMSI, MSISDN, End User Address, Access Point Name and APN Restriction information elements shall not be included in the message.

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

The SGSN shall select one GGSN based on the user provided or SGSN selected APN. The GGSN may have a logical name that is converted to an address. The conversion may be performed with any name-to-address function. The converted address shall be stored in the "GGSN Address in Use" field in the PDP context and be used during the entire lifetime of the PDP context.

If the converted address ~~is~~ includes an IPv6 address, the IPv4/IPv6 capable SGSN ~~will~~ sends Create PDP Context Request to the GGSN including IPv6 addresses in the fields SGSN Address for Control Plane and SGSN Address for user traffic. If the converted address only includes an IPv4 address, IPv4/IPv6 capable SGSN shall include IPv4 addresses in the fields SGSN Address for Control Plane and SGSN Address for user traffic.

NOTE: A DNS query may be used as the name-to-IP address mapping of the GGSN. The IP address returned in the DNS response is then stored in the "GGSN Address in Use" field in the PDP context.

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

The SGSN shall not send a Create PDP Context Request for an already active context.

*** Second Modification ***

7.3.2 Create PDP Context Response

The message shall be sent from a GGSN node to a SGSN node as a response of a Create PDP Context Request. When the SGSN receives a Create PDP Context Response with the Cause value indicating 'Request Accepted', the SGSN activates the PDP context and may start to forward T-PDUs to/from the MS from/to the external data network.

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

- "Request Accepted".
- "Context not found"
- "No resources available".
- "All dynamic PDP addresses are occupied".
- "No memory is available".
- "Missing or unknown APN".
- "Unknown PDP address or PDP type".
- "User authentication failed".
- "System failure".
- "Semantic error in the TFT operation".
- "Syntactic error in the TFT operation".

- "Semantic errors in packet filter(s)".
- "Syntactic errors in packet filters(s)".
- "Mandatory IE incorrect".
- "Mandatory IE missing".
- "Optional IE incorrect".
- "Invalid message format".
- "PDP context without TFT already activated".
- "APN access denied – no subscription".
- "APN Restriction type incompatibility with currently active PDP Contexts"

'No resources available' indicates that not enough resources are available within the network to allow the PDP 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.

'User authentication failed' indicates that the external packet network has rejected the service requested by the user e.g. the authentication check in the RADIUS server failed. 'PDP context without TFT already activated' indicates that a PDP context has already been activated without a TFT for that MS. 'Context not found' indicates that a Create PDP Request for a subsequent PDP context has been received, but the PDP context associated with the request, which the SGSN believes to be active does not exist on the GGSN. 'APN access denied – no subscription' indicates that the GGSN has denied the user access to an APN because a subscription is required, but the subscriber does not have the necessary subscription.

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

All information elements, except Recovery, Protocol Configuration Options, 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 for Data (I) field specifies an uplink Tunnel Endpoint Identifier for G-PDUs that is chosen by the GGSN. The SGSN shall include this Tunnel Endpoint Identifier in the GTP header of all subsequent uplink G-PDUs which are related to the requested PDP context.

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 PDP context. If the GGSN has already confirmed successful assignment of its Tunnel Endpoint Identifier Control Plane to the peer SGSN, this field shall not be present. The GGSN confirms successful assignment of its Tunnel Endpoint Identifier Control Plane to the SGSN when it receives any message with its assigned Tunnel Endpoint Identifier Control Plane in the GTP header from the SGSN.

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

If the Create PDP 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 GGSN Address for user traffic, and IPv4 addresses in the fields Alternative GGSN Address for Control Plane and Alternative GGSN Address for user traffic. If SGSN included ~~only an~~ IPv4 SGSN addresses in the request, IPv4/IPv6 capable GGSN shall include IPv4 addresses in the fields GGSN Address for Control Plane and GGSN Address for user traffic, and IPv6 addresses in the fields Alternative GGSN Address for Control Plane and Alternative GGSN Address for user traffic. The SGSN shall store these GGSN Addresses and use one set of them when sending control plane on this GTP tunnel or G-PDUs to the GGSN for the MS.

***** Third Modification *******7.5A.1.5 Create MBMS Context Request**

A Create MBMS Context Request shall be sent from an SGSN node to a GGSN nodes 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.