

Technical Specification Group Services and System Aspects TSGS#27(05)0176
Meeting #27, 14 - 17 March 2005, Tokyo, Japan

Source: TSG SA WG2
Title: CR(s) to 23.060
Agenda item: 7.2.3
Document for: APPROVAL

S2 Tdoc	Title	Spec	CR	Rev	Cat	C_Ver	Rel	WI
S2-050529	Correction of Packet Flow ID Allocation	23.060	525	2	F	5.9.0	Rel-5	TE16
S2-050530	Correction of Packet Flow ID Allocation	23.060	526	2	A	6.7.0	Rel-6	TE16

CHANGE REQUEST

23.060 **CR 525** rev 2 Current version: 5.9.0

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

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

Title:	☞ Correction of Packet Flow ID Allocation		
Source:	☞ 3GPP TSG_SA WG2		
Work item code:	☞ TEI-5	Date:	☞ 26/1/2005
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: 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:	☞ TS 23.060 requires to suppress the allocation of a Packet Flow ID (PFI) to an MS when the BSS does not support the related PFC procedures. However, the UE may move between BSSs, i.e. the Packet Flow ID may be allocated when in the service area of a supporting BSS and when the UE moves to a non-supporting BSS the MS shall not send the PFI to that BSS.
	So there is no need to suppress the PFI allocation when the BSS does not support PFC procedures. In addition this would avoid the overhead of PDP context modification procedures an MS or the SGSN needs to perform when entering the first time the area of a supporting BSS with PDP contexts that were allocated via a non-supporting BSS. As this is obviously implementation specific it results in non-deterministic usage of PFC procedures in such situations.
Summary of change:	☞ The restriction of not allocating packet flow IDs when the BSS is not supporting the PFC procedures is removed.
Consequences if not approved:	☞ Useless functionality that results in non-deterministic usage of PFC procedures. It remains ambiguous whether allocation of a PFI by PDP modification procedures at BSS change is task of MS or of SGSN or implementation specific.


Clauses affected:	☞ 9.2.2.1, 9.2.2.2, 9.2.3.1, 9.2.3.2, 9.2.3.3											
Other specs affected:	<table border="1" style="border-collapse: collapse;"> <tr> <td style="border: none;">☞</td> <td style="border: none;">Y</td> <td style="border: none;">N</td> </tr> <tr> <td style="border: none;">☞</td> <td style="border: none;">X</td> <td style="border: none;">X</td> </tr> <tr> <td style="border: none;">☞</td> <td style="border: none;">X</td> <td style="border: none;">X</td> </tr> </table>	☞	Y	N	☞	X	X	☞	X	X	Other core specifications	☞
☞	Y	N										
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☞	X	X										
		Test 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.

9.2.2.1 PDP Context Activation Procedure

The PDP Context Activation procedure is illustrated in Figure 63 and Figure 64.

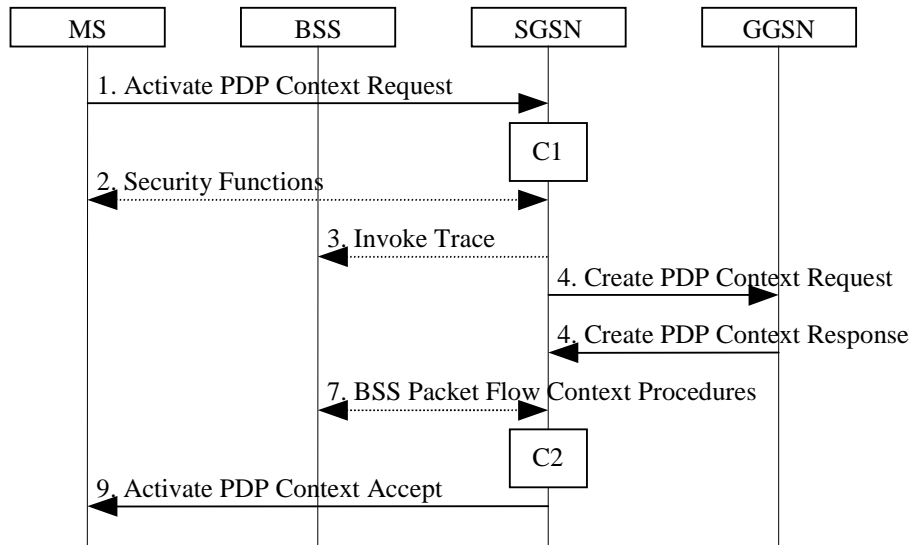


Figure 63: PDP Context Activation Procedure for A/Gb mode

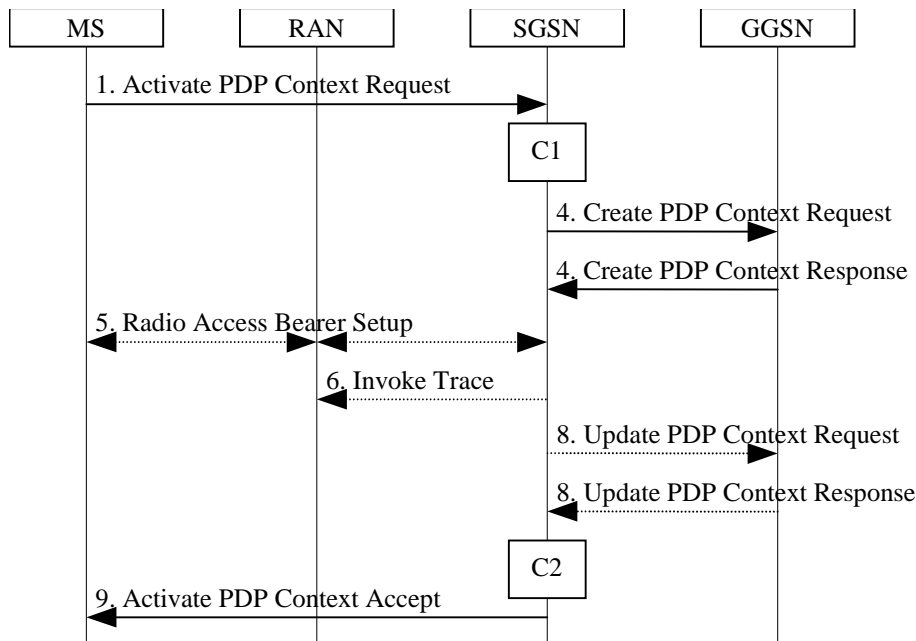


Figure 64: PDP Context Activation Procedure for Iu mode

- 1) The MS sends an Activate PDP Context Request (NSAPI, TI, PDP Type, PDP Address, Access Point Name, QoS Requested, PDP Configuration Options) message to the SGSN. The MS shall use PDP Address to indicate whether it requires the use of a static PDP address or whether it requires the use of a dynamic PDP address. The MS shall leave PDP Address empty to request a dynamic PDP address. The MS may use Access Point Name to select a reference point to a certain packet data network and/or to select a service. Access Point Name is a logical name referring to the packet data network and/or to a service that the subscriber wishes to connect to. QoS Requested indicates the desired QoS profile. PDP Configuration Options may be used to transfer optional PDP parameters and/or request to the GGSN (see GSM 29.060 [26] and 24.229 [75]). PDP Configuration Options is sent transparently through the SGSN.
- 2) In A/Gb mode, security functions may be executed. These procedures are defined in clause "Security Function".

- 3) In A/Gb mode and if BSS trace is activated, the SGSN shall send an Invoke Trace (Trace Reference, Trace Type, Trigger Id, OMC Identity) message to the BSS. Trace Reference, and Trace Type are copied from the trace information received from the HLR or OMC.
- 4) The SGSN validates the Activate PDP Context Request using PDP Type (optional), PDP Address (optional), and Access Point Name (optional) provided by the MS and the PDP context subscription records. The validation criteria, the APN selection criteria, and the mapping from APN to a GGSN are described in annex A.

If no GGSN address can be derived or if the SGSN has determined that the Activate PDP Context Request is not valid according to the rules described in annex A, the SGSN rejects the PDP context activation request.

If a GGSN address can be derived, the SGSN creates a TEID for the requested PDP context. If the MS requests a dynamic address, the SGSN lets a GGSN allocate the dynamic address. The SGSN may restrict the requested QoS attributes given its capabilities and the current load, and it shall restrict the requested QoS attributes according to the subscribed QoS profile.

The SGSN sends a Create PDP Context Request (PDP Type, PDP Address, Access Point Name, QoS Negotiated, TEID, NSAPI, MSISDN, Selection Mode, Charging Characteristics, Trace Reference, Trace Type, Trigger Id, OMC Identity, PDP Configuration Options, serving network identity) message to the affected GGSN. The SGSN should send the serving network identity to the GGSN. Access Point Name shall be the APN Network Identifier of the APN selected according to the procedure described in Annex A. PDP Address shall be empty if a dynamic address is requested. The GGSN may use Access Point Name to find a packet data network and optionally to activate a service for this APN. Selection Mode indicates whether a subscribed APN was selected, or whether a non-subscribed APN sent by an MS or a non-subscribed APN chosen by the SGSN was selected. Selection Mode is set according to Annex A. The GGSN may use Selection Mode when deciding whether to accept or reject the PDP context activation. For example, if an APN requires subscription, the GGSN is configured to accept only the PDP context activation that requests a subscribed APN as indicated by the SGSN with Selection Mode. Charging Characteristics indicates which kind of charging the PDP context is liable for. The charging characteristics on the GPRS subscription and individually subscribed APNs as well as the way the SGSN handles Charging Characteristics and chooses to send them or not to the GGSN is defined in 3GPP TS 32.215 [70]. The SGSN shall include Trace Reference, Trace Type, Trigger Id, and OMC Identity if GGSN trace is activated. The SGSN shall copy Trace Reference, Trace Type, and OMC Identity from the trace information received from the HLR or OMC.

The GGSN creates a new entry in its PDP context table and generates a Charging Id. The new entry allows the GGSN to route PDP PDUs between the SGSN and the packet data network, and to start charging. The way the GGSN handles Charging Characteristics that it may have received from the SGSN is defined in 3GPP TS 32.215 [70]. The GGSN may restrict QoS Negotiated given its capabilities, operator policies and the current load. The GGSN then returns a Create PDP Context Response (TEID, PDP Address, PDP Configuration Options, QoS Negotiated, Charging Id, Cause) message to the SGSN. PDP Address is included if the GGSN allocated a PDP address. If the GGSN has been configured by the operator to use External PDN Address Allocation for the requested APN, PDP Address shall be set to 0.0.0.0, indicating that the PDP address shall be negotiated by the MS with the external PDN after completion of the PDP Context Activation procedure. The GGSN shall relay, modify and monitor these negotiations as long as the PDP context is in ACTIVE state, and use the GGSN-Initiated PDP Context Modification procedure to transfer the currently used PDP address to the SGSN and the MS. PDP Configuration Options contain optional PDP parameters that the GGSN may transfer to the MS. These optional PDP parameters may be requested by the MS in the Activate PDP Context Request message, or may be sent unsolicited by the GGSN. PDP Configuration Options is sent transparently through the SGSN. The Create PDP Context messages are sent over the backbone network.

If QoS Negotiated received from the SGSN is incompatible with the PDP context being activated, the GGSN rejects the Create PDP Context Request message. The GGSN operator configures the compatible QoS profiles.

- 5) In Iu mode, RAB setup is done by the RAB Assignment procedure, see subclause "RAB Assignment Procedure".
- 6) In Iu mode and if BSS trace is activated, the SGSN shall send an Invoke Trace (Trace Reference, Trace Type, Trigger Id, OMC Identity) message to the RAN. Trace Reference, and Trace Type are copied from the trace information received from the HLR or OMC.
- 7) In A/Gb mode, BSS packet flow context procedures may be executed. These procedures are defined in clause "BSS Context".

- 8) In Iu mode and in case the QoS attributes have been downgraded in step 5, the SGSN may inform the GGSN about the downgraded QoS attributes by sending an Update PDP Context Request to the affected GGSN. The GGSN confirms the new QoS attributes by sending an Update PDP Context Response to the SGSN.
- 9) The SGSN inserts the NSAPI along with the GGSN address in its PDP context. If the MS has requested a dynamic address, the PDP address received from the GGSN is inserted in the PDP context. The SGSN selects Radio Priority and Packet Flow Id based on QoS Negotiated, and returns an Activate PDP Context Accept (PDP Type, PDP Address, TI, QoS Negotiated, Radio Priority, Packet Flow Id, PDP Configuration Options) message to the MS. If the MS indicated in the MS Network Capability it does not support BSS packet flow procedures ~~or if the BSS does not support BSS packet flow procedures~~, then the SGSN should not include the Packet Flow Id. PDP Configuration Options may be used to transfer optional PDP parameters to the UE (see GSM 29.060 [26] and 24.229 [75]). PDP Configuration Options is sent transparently through the SGSN. The SGSN is now able to route PDP PDUs between the GGSN and the MS, and to start charging.

For each PDP Address a different quality of service (QoS) profile may be requested. For example, some PDP addresses may be associated with E-mail that can tolerate lengthy response times. Other applications cannot tolerate delay and demand a very high level of throughput, interactive applications being one example. These different requirements are reflected in the QoS profile. The QoS profile is defined in clause "Quality of Service Profile". If a QoS requirement is beyond the capabilities of a PLMN, the PLMN negotiates the QoS profile as close as possible to the requested QoS profile. The MS either accepts the negotiated QoS profile, or deactivates the PDP context.

After an SGSN has successfully updated the GGSN, the PDP contexts associated with an MS is distributed as shown in clause "Information Storage".

If the PDP Context Activation Procedure fails or if the SGSN returns an Activate PDP Context Reject (Cause, PDP Configuration Options) message, the MS may attempt another activation to the same APN up to a maximum number of attempts.

The CAMEL procedure calls shall be performed, see referenced procedures in 3GPP TS 23.078:

- C1) CAMEL_GPRS_PDP_Context_Establishment.

In Figure 63 and Figure 64, procedures return as result "Continue".

- C2) CAMEL_GPRS_PDP_Context_Establishment_Acknowledgement.

In Figure 63 and Figure 64, procedures return as result "Continue".

9.2.2.1.1 Secondary PDP Context Activation Procedure

The Secondary PDP Context Activation procedure may be used to activate a PDP context while reusing the PDP address and other PDP context information from an already active PDP context, but with a different QoS profile. Procedures for APN selection and PDP address negotiation are not executed. A unique TI and a unique NSAPI shall identify each PDP context sharing the same 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. The TFT contains attributes that specify an IP header filter that is used to direct data packets received from the interconnected packet data network to the newly activated PDP context.

The Secondary PDP Context Activation procedure may only be initiated after a PDP context is already activated for the same PDP address and APN. The procedure is illustrated in Figure 65 and Figure 66.

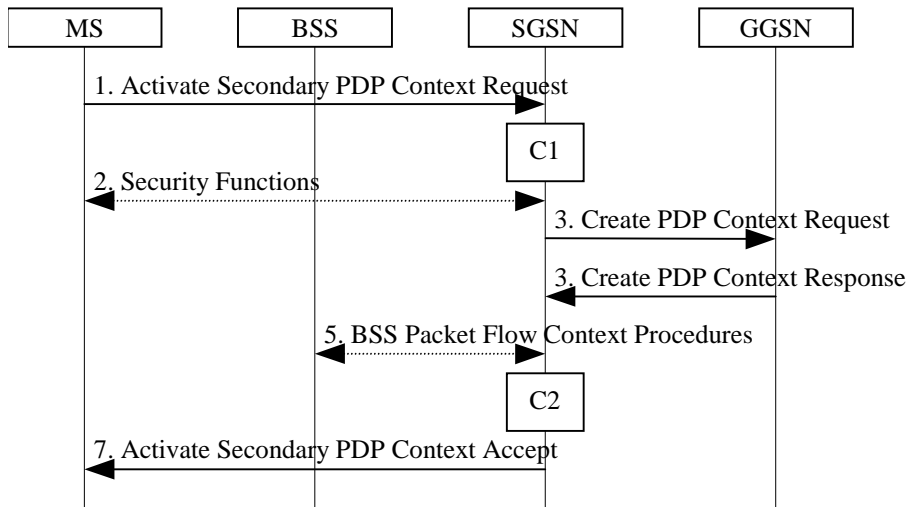


Figure 65: Secondary PDP Context Activation Procedure for A/Gb mode

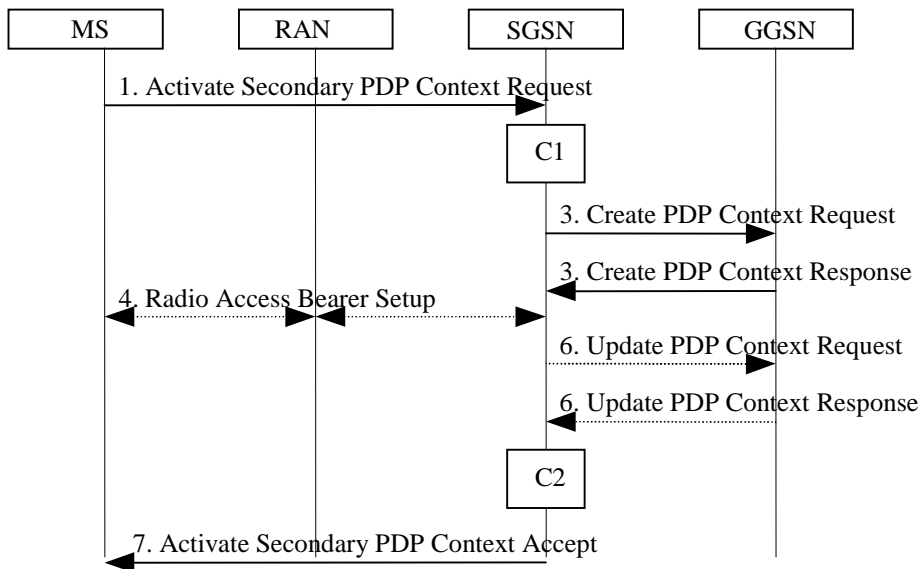


Figure 66: Secondary PDP Context Activation Procedure for Iu mode

- 1) The MS sends an Activate Secondary PDP Context Request (Linked TI, NSAPI, TI, QoS Requested, TFT, PDP Configuration Options) message to the SGSN. Linked TI indicates the TI value assigned to any one of the already activated PDP contexts for this PDP address and APN. QoS Requested indicates the desired QoS profile. TFT is sent transparently through the SGSN to the GGSN to enable packet classification for downlink data transfer. TI and NSAPI contain values not used by any other activated PDP context. PDP Configuration Options may be used to transfer optional PDP parameters and/or requests to the GGSN (see GSM 29.060 [26] and 24.229 [75]). PDP Configuration Options is sent transparently through the SGSN.
- 2) In A/Gb mode, security functions may be executed. These procedures are defined in clause "Security Function".
- 3) The SGSN validates the Activate Secondary PDP Context Request using the TI indicated by Linked TI. The same GGSN address is used by the SGSN as for the already-activated PDP context(s) for that TI and PDP address.

The SGSN may restrict the requested QoS attributes given its capabilities and the current load, and it shall restrict the requested QoS attributes according to the subscribed QoS profile, which represents the maximum QoS per PDP context to the associated APN. The GGSN may restrict and negotiate the requested QoS as specified in clause "PDP Context Activation Procedure". The SGSN sends a Create PDP Context Request (QoS Negotiated, TEID, NSAPI, Primary NSAPI, TFT, PDP Configuration Options, serving network identity) message to the affected GGSN. The SGSN should send the serving network identity to the GGSN. Primary NSAPI indicates the NSAPI value assigned to any one of the already activated PDP contexts for this PDP address and APN. TFT is included only if received in the Activate Secondary PDP Context Request message. PDP Configuration Options is sent transparently through the SGSN if received in the Activate secondary PDP Context Request message.

The GGSN uses the same packet data network as used by the already-activated PDP context(s) for that PDP address, generates a new entry in its PDP context table, and stores the TFT. The new entry allows the GGSN to route PDP PDUs via different GTP tunnels between the SGSN and the packet data network. The GGSN returns a Create PDP Context Response (TEID, QoS Negotiated, Cause, PDP Configuration Options) message to the SGSN. PDP Configuration Options may be used to transfer optional PDP parameters to the UE (see GSM 29.060 [26] and 24.229 [75]).

- 4) In Iu mode, RAB setup is done by the RAB Assignment procedure.
- 5) In A/Gb mode, BSS packet flow context procedures may be executed. These procedures are defined in clause "BSS Context".
- 6) In Iu mode and in case the QoS attributes have been downgraded in step 4, the SGSN may inform the GGSN about the downgraded QoS attributes by sending an Update PDP Context Request to the affected GGSN. The GGSN confirms the new QoS attributes by sending an Update PDP Context Response to the SGSN.
- 7) The SGSN selects Radio Priority and Packet Flow Id based on QoS Negotiated, and returns an Activate Secondary PDP Context Accept (TI, QoS Negotiated, Radio Priority, Packet Flow Id, PDP Configuration Options) message to the MS. If the MS indicated in the MS Network Capability it does not support BSS packet flow procedures ~~or if the BSS does not support BSS packet flow procedures~~, then the SGSN should not include the Packet Flow Id. PDP Configuration Options is sent transparently through the SGSN if received in the Create PDP Context Response message. The SGSN is now able to route PDP PDUs between the GGSN and the MS via different GTP tunnels and possibly different LLC links.

For each additionally activated PDP context a QoS profile and TFT may be requested.

If the secondary PDP context activation procedure fails or if the SGSN returns an Activate Secondary PDP Context Reject (Cause, PDP Configuration Options) message, the MS may attempt another activation with a different TFT, depending on the cause.

The CAMEL procedure calls shall be performed, see referenced procedures in 3GPP TS 23.078:

- C1) CAMEL_GPRS_PDP_Context_Establishment.

In Figure 65 and in Figure 66, procedures return as result "Continue".

- C2) CAMEL_GPRS_PDP_Context_Establishment_Acknowledgement.

In Figure 65 and in Figure 66, procedures return as result "Continue".

9.2.3.1 SGSN-Initiated PDP Context Modification Procedure

The SGSN-Initiated PDP Context Modification procedure is illustrated in Figure 70.

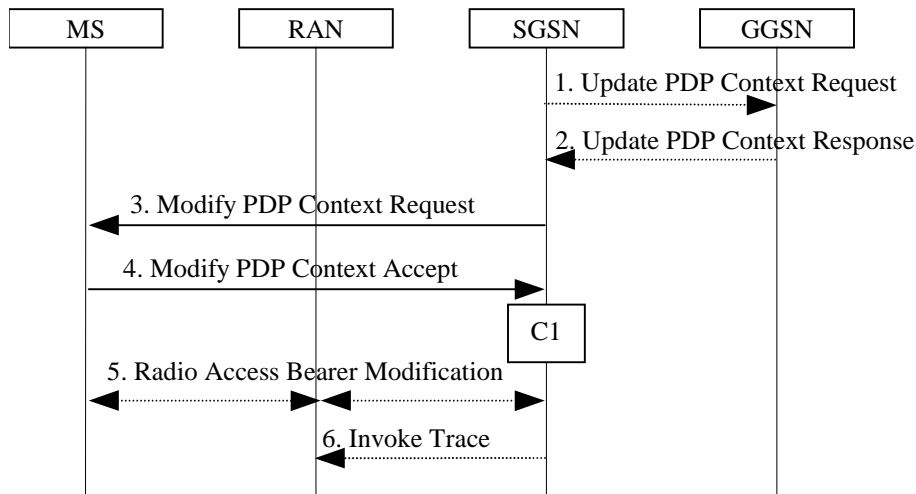


Figure 70: SGSN-Initiated PDP Context Modification Procedure

- 1) The SGSN may send an Update PDP Context Request (TEID, NSAPI, QoS Negotiated, Trace Reference, Trace Type, Trigger Id, OMC Identity, serving network identity) message to the GGSN. The SGSN should send the serving network identity to the GGSN. If QoS Negotiated received from the SGSN is incompatible with the PDP context being modified, the GGSN rejects the Update PDP Context Request. The GGSN operator configures the compatible QoS profiles. The SGSN shall include Trace Reference, Trace Type, Trigger Id, and OMC Identity in the message if GGSN trace is activated while the PDP context is active. The SGSN shall copy Trace Reference, Trace Type, and OMC Identity from the trace information received from the HLR or OMC.
- 2) The GGSN may restrict QoS Negotiated given its capabilities and the current load. The GGSN stores QoS Negotiated and returns an Update PDP Context Response (TEID, QoS Negotiated, Cause) message.
- 3) The SGSN selects Radio Priority and Packet Flow Id based on QoS Negotiated, and may send a Modify PDP Context Request (TI, QoS Negotiated, Radio Priority, Packet Flow Id) message to the MS. If the MS indicated in the MS Network Capability it does not support BSS packet flow procedures ~~or if the BSS does not support BSS packet flow procedures~~, then the SGSN should not include the Packet Flow Id.
- 4) The MS acknowledges by returning a Modify PDP Context Accept message. If the MS does not accept the new QoS Negotiated it shall instead de-activate the PDP context with the PDP Context Deactivation Initiated by the MS procedure.
- 5) In Iu mode, radio access bearer modification may be performed by the RAB Assignment procedure.
- 6) If BSS trace is activated while the PDP context is active, the SGSN shall send an Invoke Trace (Trace Reference, Trace Type, Trigger Id, OMC Identity) message to the RAN. Trace Reference, and Trace Type are copied from the trace information received from the HLR or OMC.

The CAMEL procedure calls shall be performed, see referenced procedure in 3GPP TS 23.078:

- C1) CAMEL_GPRS_Change_Of_QoS.

The procedure returns as result "Continue".

9.2.3.2 GGSN-Initiated PDP Context Modification Procedure

The GGSN-Initiated PDP Context Modification procedure is illustrated in Figure 71.

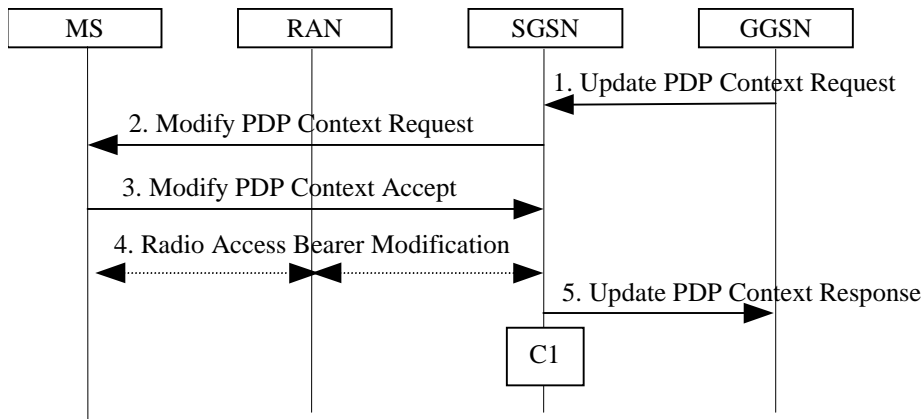


Figure 71: GGSN-Initiated PDP Context Modification Procedure

- 1) The GGSN sends an Update PDP Context Request (TEID, NSAPI, PDP Address, QoS Requested) message to the SGSN. QoS Requested indicates the desired QoS profile. PDP Address is optional.
- 2) The SGSN may restrict the desired QoS profile given its capabilities, the current load, the current QoS profile, and the subscribed QoS profile. The SGSN selects Radio Priority and Packet Flow Id based on QoS Negotiated, and sends a Modify PDP Context Request (TI, PDP Address, QoS Negotiated, Radio Priority, Packet Flow Id) message to the MS. PDP Address is optional. If the MS indicated in the MS Network Capability it does not support BSS packet flow procedures ~~or if the BSS does not support BSS packet flow procedures~~, then the SGSN should not include the Packet Flow Id.
- 3) The MS acknowledges by returning a Modify PDP Context Accept message. If the MS does not accept the new QoS Negotiated it shall instead de-activate the PDP context with the PDP Context Deactivation Initiated by MS procedure.
- 4) In Iu mode, radio access bearer modification may be performed by the RAB Assignment procedure.
- 5) Upon receipt of the Modify PDP Context Accept message, or upon completion of the RAB modification procedure, the SGSN returns an Update PDP Context Response (TEID, QoS Negotiated) message to the GGSN. If the SGSN receives a Deactivate PDP Context Request message, it shall instead follow the PDP Context Deactivation Initiated by MS procedure.

The CAMEL procedure calls shall be performed, see referenced procedure in 3GPP TS 23.078:

C1) CAMEL_GPRS_Change_Of_QoS.

The procedure returns as result "Continue".

9.2.3.3 MS-Initiated PDP Context Modification Procedure

The MS-Initiated PDP Context Modification procedure is illustrated in Figure 72.

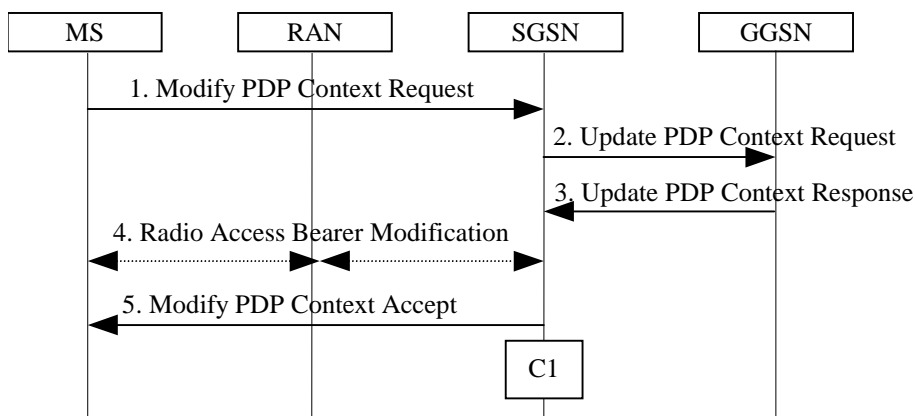


Figure 72: MS-Initiated PDP Context Modification Procedure

- 1) The MS sends a Modify PDP Context Request (TI, QoS Requested, TFT, PDP Configuration Options) message to the SGSN. Either QoS Requested or TFT or both may be included. QoS Requested indicates the desired QoS profile, while TFT indicates the TFT that is to be added or modified or deleted from the PDP context. PDP Configuration Options may be used to transfer optional PDP parameters and/or requests to the GGSN.
- 2) The SGSN may restrict the desired QoS profile given its capabilities, the current load, and the subscribed QoS profile. The SGSN sends an Update PDP Context Request (TEID, NSAPI, QoS Negotiated, TFT, PDP Configuration Options, serving network identity) message to the GGSN. The SGSN should send the serving network identity to the GGSN. If QoS Negotiated and/or TFT received from the SGSN is incompatible with the PDP context being modified (e.g., TFT contains inconsistent packet filters), the GGSN rejects the Update PDP Context Request. The GGSN operator configures the compatible QoS profile. PDP Configuration Options is sent transparently through the SGSN if received in Modify PDP Context Request message.
- 3) The GGSN may further restrict QoS Negotiated given its capabilities, operator policies and the current load. The GGSN stores QoS Negotiated, stores, modifies, or deletes TFT of that PDP context as indicated in TFT, and returns an Update PDP Context Response (TEID, QoS Negotiated, PDP Configuration Options) message. PDP Configuration Options may be used to transfer optional PDP parameters to the UE.
- 4) In Iu mode, radio access bearer modification may be performed by the RAB Assignment procedure. In case the radio access bearer does not exist the RAB setup is done by the RAB Assignment procedure.
- 5) The SGSN selects Radio Priority and Packet Flow Id based on QoS Negotiated, and returns a Modify PDP Context Accept (TI, QoS Negotiated, Radio Priority, Packet Flow Id, PDP Configuration Options) message to the MS. If the MS indicated in the MS Network Capability it does not support BSS packet flow procedures ~~or if the BSS does not support BSS packet flow procedures~~, then the SGSN should not include the Packet Flow Id. PDP Configuration Options is sent transparently through the SGSN if received in Modify PDP Context Response message.

NOTE1: If the SGSN does not accept QoS Requested, then steps 2 and 3 of this procedure are skipped, and the existing QoS Negotiated is returned to the MS in step 4.

NOTE2: In this release of the standards no procedure is defined that uses the Protocol Configuration Options in the PDP context modification procedure.

The CAMEL procedure calls shall be performed, see referenced procedure in 3GPP TS 23.078:

- C1) CAMEL_GPRS_Change_Of_QoS.

The procedure returns as result "Continue".

CHANGE REQUEST

23.060 CR 526 rev 2 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:	Correction of Packet Flow ID Allocation		
Source:	3GPP TSG_SA WG2		
Work item code:	TEI-6	Date:	26/1/2005
Category:	A	Release:	Rel-6
	<p>Use <u>one</u> of the following categories:</p> <p>F (correction)</p> <p>A (corresponds to a correction in an earlier release)</p> <p>B (addition of feature),</p> <p>C (functional modification of feature)</p> <p>D (editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP TR 21.900.</p>		<p>Use <u>one</u> of the following releases:</p> <p>Ph2 (GSM Phase 2)</p> <p>R96 (Release 1996)</p> <p>R97 (Release 1997)</p> <p>R98 (Release 1998)</p> <p>R99 (Release 1999)</p> <p>Rel-4 (Release 4)</p> <p>Rel-5 (Release 5)</p> <p>Rel-6 (Release 6)</p> <p>Rel-7 (Release 7)</p>

Reason for change:	<p>TS 23.060 requires to suppress the allocation of a Packet Flow ID (PFI) to an MS when the BSS does not support the related PFC procedures. However, the UE may move between BSSs, i.e. the Packet Flow ID may be allocated when in the service area of a supporting BSS and when the UE moves to a non-supporting BSS the MS shall not send the PFI to that BSS.</p> <p>So there is no need to suppress the PFI allocation when the BSS does not support PFC procedures. In addition this would avoid the overhead of PDP context modification procedures an MS or the SGSN needs to perform when entering the first time the area of a supporting BSS with PDP contexts that were allocated via a non-supporting BSS. As this is obviously implementation specific it results in non-deterministic usage of PFC procedures in such situations.</p>
Summary of change:	The restriction of not allocating packet flow IDs when the BSS is not supporting the PFC procedures is removed.
Consequences if not approved:	Useless functionality that results in non-deterministic usage of PFC procedures. It remains ambiguous whether allocation of a PFI by PDP modification procedures at BSS change is task of MS or of SGSN or implementation specific.

Clauses affected:	9.2.2.1, 9.2.2.2, 9.2.3.1, 9.2.3.2, 9.2.3.3								
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;">X</td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;">X</td> <td style="text-align: center;">X</td> </tr> </table>	Y	N	X	X	X	X	Other core specifications	
Y	N								
X	X								
X	X								
		Test 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.

9.2.2.1 PDP Context Activation Procedure

The PDP Context Activation procedure is illustrated in Figure 63 and Figure 64.

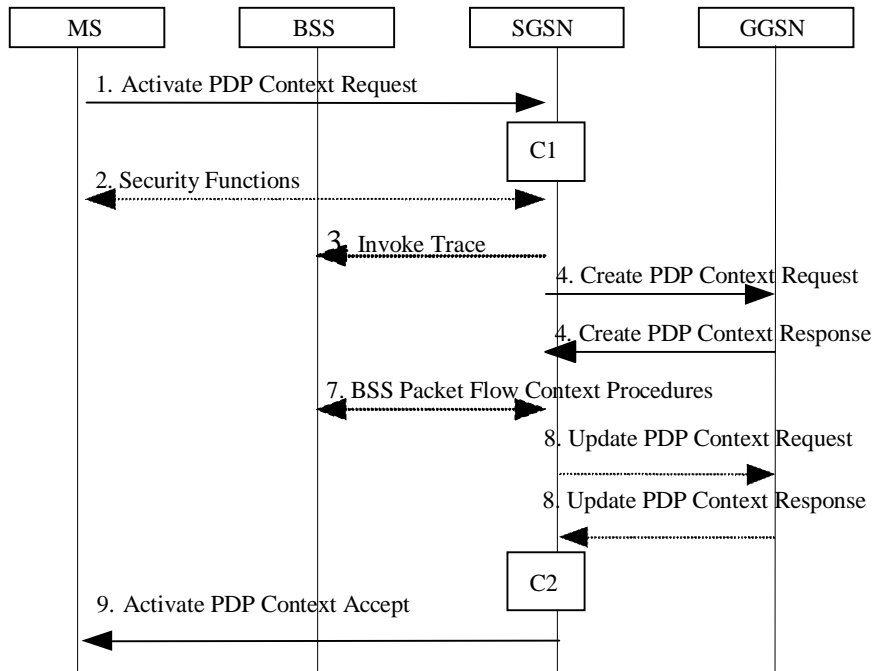


Figure 63: PDP Context Activation Procedure for A/Gb mode

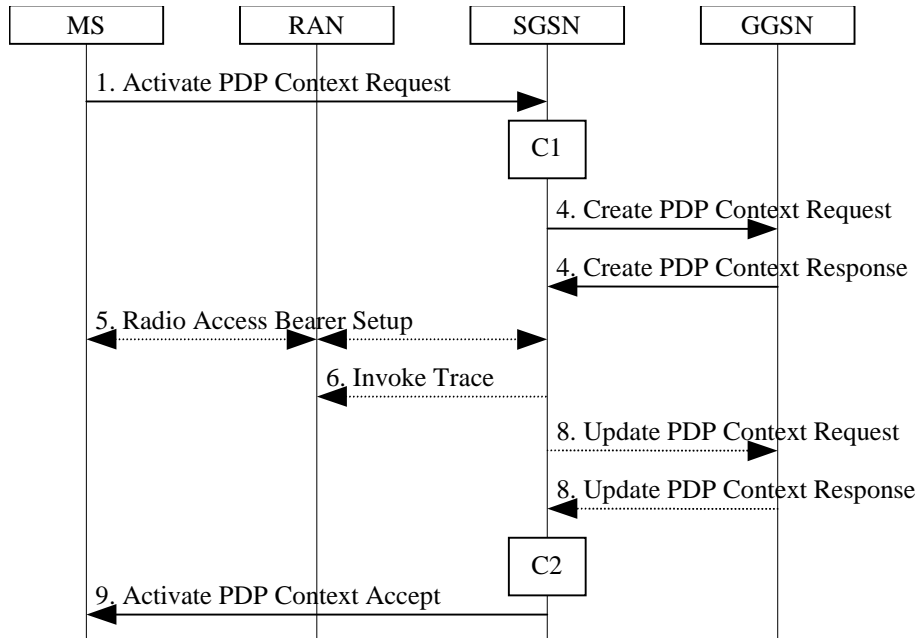


Figure 64: PDP Context Activation Procedure for Iu mode

- 1) The MS sends an Activate PDP Context Request (NSAPI, TI, PDP Type, PDP Address, Access Point Name, QoS Requested, PDP Configuration Options) message to the SGSN. The MS shall use PDP Address to indicate whether it requires the use of a static PDP address or whether it requires the use of a dynamic PDP address. The MS shall leave PDP Address empty to request a dynamic PDP address. The MS may use Access Point Name to select a reference point to a certain packet data network and/or to select a service. Access Point Name is a logical name referring to the packet data network and/or to a service that the subscriber wishes to connect to. QoS Requested indicates the desired QoS profile. PDP Configuration Options may be used to transfer optional PDP

parameters and/or request to the GGSN (see GSM 29.060 [26] and 24.229 [75]). PDP Configuration Options is sent transparently through the SGSN.

If the SGSN has stored a value for the Maximum APN restriction and the value indicates the most restrictive type, then the SGSN shall reject any Activate PDP Context requests to a different APN, using the PDP Context Activation Reject message including an appropriate error cause.

- 2) In A/Gb mode, security functions may be executed. These procedures are defined in clause "Security Function".
- 3) In A/Gb mode and if BSS trace is activated, the SGSN shall send an Invoke Trace (Trace Reference, Trace Type, Trigger Id, OMC Identity) message to the BSS. Trace Reference, and Trace Type are copied from the trace information received from the HLR or OMC.
- 4) The SGSN validates the Activate PDP Context Request using PDP Type (optional), PDP Address (optional), and Access Point Name (optional) provided by the MS and the PDP context subscription records. The validation criteria, the APN selection criteria, and the mapping from APN to a GGSN are described in annex A.

If no GGSN address can be derived or if the SGSN has determined that the Activate PDP Context Request is not valid according to the rules described in annex A, the SGSN rejects the PDP context activation request.

If a GGSN address can be derived, the SGSN creates a TEID for the requested PDP context. If the MS requests a dynamic address, the SGSN lets a GGSN allocate the dynamic address. The SGSN may restrict the requested QoS attributes given its capabilities and the current load, and it shall restrict the requested QoS attributes according to the subscribed QoS profile.

The SGSN sends a Create PDP Context Request (PDP Type, PDP Address, Access Point Name, QoS Negotiated, TEID, NSAPI, MSISDN, Selection Mode, Charging Characteristics, Trace Reference, Trace Type, Trigger Id, OMC Identity, PDP Configuration Options, serving network identity, Maximum APN Restriction IMEISV, CGI/SAI, RAT type, S-CDR CAMEL information) message to the affected GGSN. The SGSN shall send the serving network identity to the GGSN. Access Point Name shall be the APN Network Identifier of the APN selected according to the procedure described in Annex A. PDP Address shall be empty if a dynamic address is requested. The GGSN may use Access Point Name to find a packet data network and optionally to activate a service for this APN. Selection Mode indicates whether a subscribed APN was selected, or whether a non-subscribed APN sent by an MS or a non-subscribed APN chosen by the SGSN was selected. Selection Mode is set according to Annex A. The GGSN may use Selection Mode when deciding whether to accept or reject the PDP context activation. For example, if an APN requires subscription, the GGSN is configured to accept only the PDP context activation that requests a subscribed APN as indicated by the SGSN with Selection Mode. Charging Characteristics indicates which kind of charging the PDP context is liable for. The charging characteristics on the GPRS subscription and individually subscribed APNs as well as the way the SGSN handles Charging Characteristics and chooses to send them or not to the GGSN is defined in 3GPP TS 32.215 [70]. The SGSN shall include Trace Reference, Trace Type, Trigger Id, and OMC Identity if GGSN trace is activated. The SGSN shall copy Trace Reference, Trace Type, and OMC Identity from the trace information received from the HLR or OMC. The Maximum APN Restriction denotes the most stringent restriction as required by any already active PDP contexts. If there are no already active PDP contexts, this value is set to the least restrictive type (see subclause 15.4). If the GGSN receives the Maximum APN Restriction, then the GGSN shall check if the Maximum APN Restriction value does not conflict with the APN Restriction value associated with this PDP context request. If there is no conflict the request shall be allowed, otherwise the request shall be rejected with the SGSN sending a PDP Context Activation Reject Message to the MS including an appropriate error cause.

The GGSN creates a new entry in its PDP context table and generates a Charging Id. The new entry allows the GGSN to route PDP PDUs between the SGSN and the packet data network, and to start charging. The way the GGSN handles Charging Characteristics that it may have received from the SGSN is defined in 3GPP TS 32.215 [70]. The GGSN may restrict QoS Negotiated given its capabilities and the current load. The GGSN then returns a Create PDP Context Response (TEID, PDP Address, PDP Configuration Options, QoS Negotiated, Charging Id, Prohibit Payload Compression, APN Restriction, Cause) message to the SGSN. The Prohibit Payload Compression indicates that the SGSN should negotiate no data compression for this PDP context. PDP Address is included if the GGSN allocated a PDP address. If the GGSN has been configured by the operator to use External PDN Address Allocation for the requested APN, PDP Address shall be set to 0.0.0.0, indicating that the PDP address shall be negotiated by the MS with the external PDN after completion of the PDP Context Activation procedure. The GGSN shall relay, modify and monitor these negotiations as long as the PDP context is in ACTIVE state, and use the GGSN-Initiated PDP Context Modification procedure to transfer the currently used PDP address to the SGSN and the MS. PDP Configuration Options contain optional PDP

parameters that the GGSN may transfer to the MS. These optional PDP parameters may be requested by the MS in the Activate PDP Context Request message, or may be sent unsolicited by the GGSN. PDP Configuration Options is sent transparently through the SGSN. The Create PDP Context messages are sent over the backbone network.

If QoS Negotiated received from the SGSN is incompatible with the PDP context being activated, the GGSN rejects the Create PDP Context Request message. The GGSN operator configures the compatible QoS profiles.

If an APN Restriction is received from the GGSN for this PDP Context, then the SGSN shall store this value for the PDP Context and the SGSN shall check this received value with the stored value for the Maximum APN Restriction to ensure there are no conflicts between values. If the consequence of this check results in the PDP context being rejected, the SGSN shall initiate a PDP Context Deactivation and return an appropriate error cause. If the PDP Context is accepted, it shall determine a (new) value for the Maximum APN Restriction. If there is no previously stored value for Maximum APN Restriction, then the Maximum APN Restriction shall be set to the value of the received APN Restriction.

- 5) In Iu mode, RAB setup is done by the RAB Assignment procedure, see subclause "RAB Assignment Procedure".
- 6) In Iu mode and if BSS trace is activated, the SGSN shall send an Invoke Trace (Trace Reference, Trace Type, Trigger Id, OMC Identity) message to the RAN. Trace Reference, and Trace Type are copied from the trace information received from the HLR or OMC.
- 7) In A/Gb mode, BSS packet flow context procedures may be executed. These procedures are defined in clause "BSS Context".
- 8) In case the QoS attributes have been downgraded in step 7 for A/Gb mode or in step 5 for Iu mode, the SGSN may inform the GGSN about the downgraded QoS attributes by sending an Update PDP Context Request to the affected GGSN. The GGSN confirms the new QoS attributes by sending an Update PDP Context Response to the SGSN.
- 9) The SGSN inserts the NSAPI along with the GGSN address in its PDP context. If the MS has requested a dynamic address, the PDP address received from the GGSN is inserted in the PDP context. The SGSN selects Radio Priority and Packet Flow Id based on QoS Negotiated, and returns an Activate PDP Context Accept (PDP Type, PDP Address, TI, QoS Negotiated, Radio Priority, Packet Flow Id, PDP Configuration Options) message to the MS. If the MS indicated in the MS Network Capability it does not support BSS packet flow procedures ~~or if the BSS does not support BSS packet flow procedures~~, then the SGSN shall not include the Packet Flow Id. In A/Gb mode, the QoS Negotiated shall take into account the Aggregate BSS QoS Profile, if any, returned from the BSS. PDP Configuration Options may be used to transfer optional PDP parameters to the UE (see GSM 29.060 [26] and 24.229 [75]). PDP Configuration Options is sent transparently through the SGSN. The SGSN is now able to route PDP PDUs between the GGSN and the MS, and to start charging.

For each PDP Address a different quality of service (QoS) profile may be requested. For example, some PDP addresses may be associated with E-mail that can tolerate lengthy response times. Other applications cannot tolerate delay and demand a very high level of throughput, interactive applications being one example. These different requirements are reflected in the QoS profile. The QoS profile is defined in clause "Quality of Service Profile". If a QoS requirement is beyond the capabilities of a PLMN, the PLMN negotiates the QoS profile as close as possible to the requested QoS profile. The MS either accepts the negotiated QoS profile, or deactivates the PDP context.

After an SGSN has successfully updated the GGSN, the PDP contexts associated with an MS is distributed as shown in clause "Information Storage".

If the PDP Context Activation Procedure fails or if the SGSN returns an Activate PDP Context Reject (Cause, PDP Configuration Options) message, the MS may attempt another activation to the same APN up to a maximum number of attempts.

The CAMEL procedure calls shall be performed, see referenced procedures in 3GPP TS 23.078:

- C1) CAMEL_GPRS_PDP_Context_Establishment.

In Figure 63 and Figure 64, procedures return as result "Continue".

- C2) CAMEL_GPRS_PDP_Context_Establishment_Acknowledgement.

In Figure 63 and Figure 64, procedures return as result "Continue".

9.2.2.1.1 Secondary PDP Context Activation Procedure

The Secondary PDP Context Activation procedure may be used to activate a PDP context while reusing the PDP address and other PDP context information from an already active PDP context, but with a different QoS profile. Procedures for APN selection and PDP address negotiation are not executed. A unique TI and a unique NSAPI shall identify each PDP context sharing the same 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. The TFT contains attributes that specify an IP header filter that is used to direct data packets received from the interconnected packet data network to the newly activated PDP context.

The Secondary PDP Context Activation procedure may only be initiated after a PDP context is already activated for the same PDP address and APN. The procedure is illustrated in Figure 65 and Figure 66.

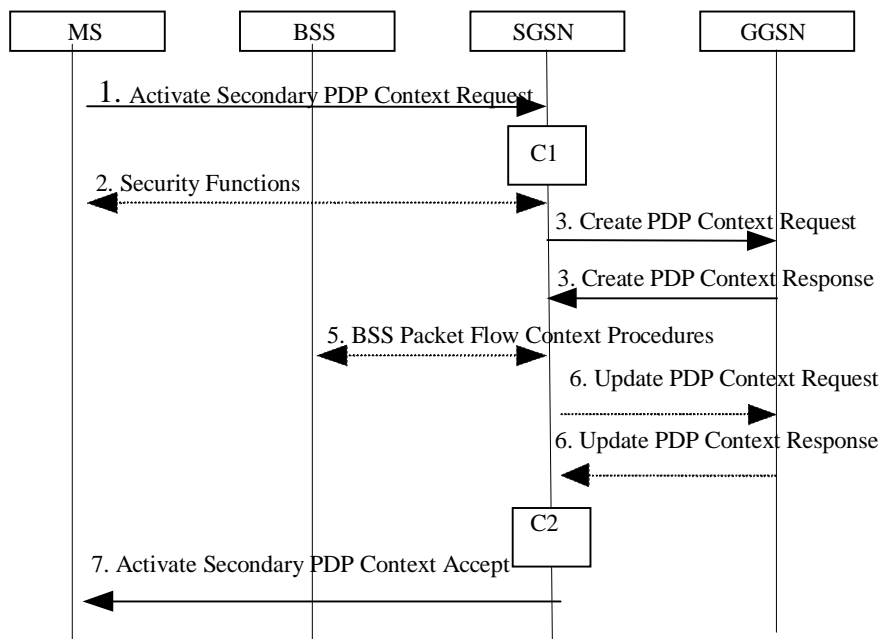


Figure 65: Secondary PDP Context Activation Procedure for A/Gb mode

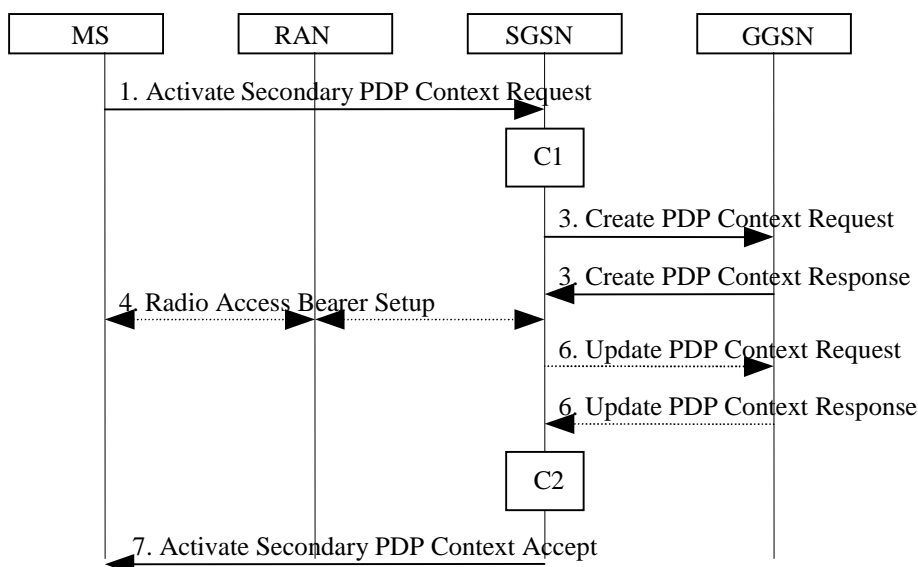


Figure 66: Secondary PDP Context Activation Procedure for Iu mode

- 1) The MS sends an Activate Secondary PDP Context Request (Linked TI, NSAPI, TI, QoS Requested, TFT, PDP Configuration Options) message to the SGSN. Linked TI indicates the TI value assigned to any one of the

already activated PDP contexts for this PDP address and APN. QoS Requested indicates the desired QoS profile. TFT is sent transparently through the SGSN to the GGSN to enable packet classification for downlink data transfer. TI and NSAPI contain values not used by any other activated PDP context. PDP Configuration Options may be used to transfer optional PDP parameters and/or requests to the GGSN (see GSM 29.060 [26] and 24.229 [75]). PDP Configuration Options is sent transparently through the SGSN.

- 2) In A/Gb mode, security functions may be executed. These procedures are defined in clause "Security Function".
- 3) The SGSN validates the Activate Secondary PDP Context Request using the TI indicated by Linked TI. The same GGSN address is used by the SGSN as for the already-activated PDP context(s) for that TI and PDP address.

The SGSN may restrict the requested QoS attributes given its capabilities and the current load, and it shall restrict the requested QoS attributes according to the subscribed QoS profile, which represents the maximum QoS per PDP context to the associated APN. The GGSN may restrict and negotiate the requested QoS as specified in clause "PDP Context Activation Procedure". The SGSN sends a Create PDP Context Request (QoS Negotiated, TEID, NSAPI, Primary NSAPI, TFT, PDP Configuration Options, serving network identity, IMEISV, CGI/SAI, RAT type, S-CDR CAMEL information) message to the affected GGSN. The SGSN shall send the serving network identity to the GGSN. Primary NSAPI indicates the NSAPI value assigned to any one of the already activated PDP contexts for this PDP address and APN. TFT is included only if received in the Activate Secondary PDP Context Request message. PDP Configuration Options is sent transparently through the SGSN if received in the Activate secondary PDP Context Request message.

The GGSN uses the same packet data network as used by the already-activated PDP context(s) for that PDP address, generates a new entry in its PDP context table, and stores the TFT. The new entry allows the GGSN to route PDP PDUs via different GTP tunnels between the SGSN and the packet data network. The GGSN returns a Create PDP Context Response (TEID, QoS Negotiated, Cause, PDP Configuration Options, Prohibit Payload Compression, APN Restriction) message to the SGSN. PDP Configuration Options may be used to transfer optional PDP parameters to the UE (see GSM 29.060 [26] and 24.229 [75]). The Prohibit Payload Compression indicates that the SGSN should negotiate no data compression for this PDP context. If an APN Restriction is received from the GGSN for this PDP Context, then the SGSN shall store this value for the PDP Context.

- 4) In Iu mode, RAB setup is done by the RAB Assignment procedure.
- 5) In A/Gb mode, BSS packet flow context procedures may be executed. These procedures are defined in clause "BSS Context".
- 6) In case the QoS attributes have been downgraded in step 5 for A/Gb mode or in step 4 for Iu mode, the SGSN may inform the GGSN about the downgraded QoS attributes by sending an Update PDP Context Request to the affected GGSN. The GGSN confirms the new QoS attributes by sending an Update PDP Context Response to the SGSN.
- 7) The SGSN selects Radio Priority and Packet Flow Id based on QoS Negotiated, and returns an Activate Secondary PDP Context Accept (TI, QoS Negotiated, Radio Priority, Packet Flow Id, PDP Configuration Options) message to the MS. If the MS indicated in the MS Network Capability it does not support BSS packet flow procedures ~~or if the BSS does not support BSS packet flow procedures~~, then the SGSN shall not include the Packet Flow Id. In A/Gb mode, the QoS Negotiated shall take into account the Aggregate BSS QoS Profile, if any, returned from the BSS. PDP Configuration Options is sent transparently through the SGSN if received in the Create PDP Context Response message. The SGSN is now able to route PDP PDUs between the GGSN and the MS via different GTP tunnels and possibly different LLC links.

For each additionally activated PDP context a QoS profile and TFT may be requested.

If the secondary PDP context activation procedure fails or if the SGSN returns an Activate Secondary PDP Context Reject (Cause, PDP Configuration Options) message, the MS may attempt another activation with a different TFT, depending on the cause.

The CAMEL procedure calls shall be performed, see referenced procedures in 3GPP TS 23.078:

- C1) CAMEL_GPRS_PDP_Context_Establishment.

In Figure 65 and in Figure 66, procedures return as result "Continue".

- C2) CAMEL_GPRS_PDP_Context_Establishment_Acknowledgement.

In Figure 65 and in Figure 66, procedures return as result "Continue".

9.2.3.1 SGSN-Initiated PDP Context Modification Procedure

The SGSN-Initiated PDP Context Modification procedure is illustrated in Figures 70a and 70b.

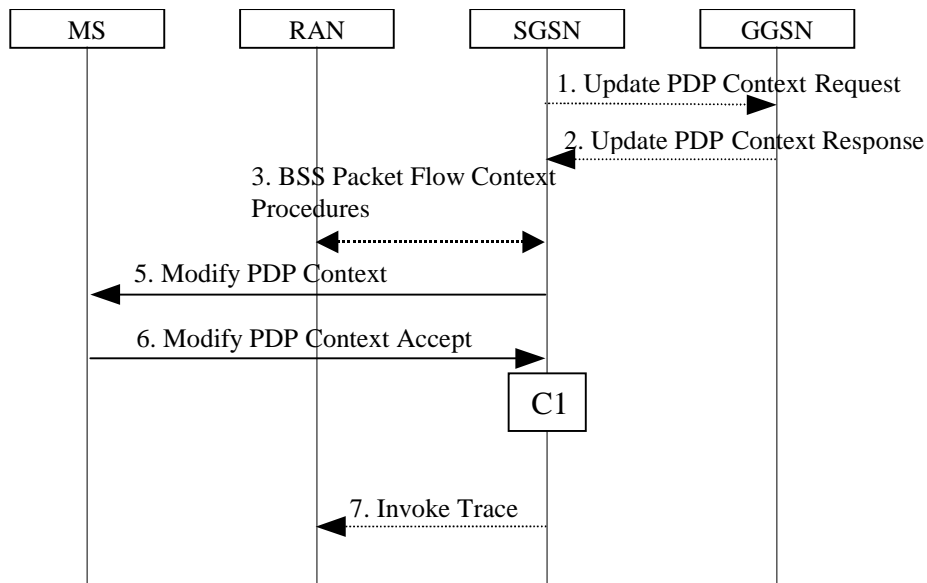


Figure 70a: SGSN-Initiated PDP Context Modification Procedure, A/Gb mode

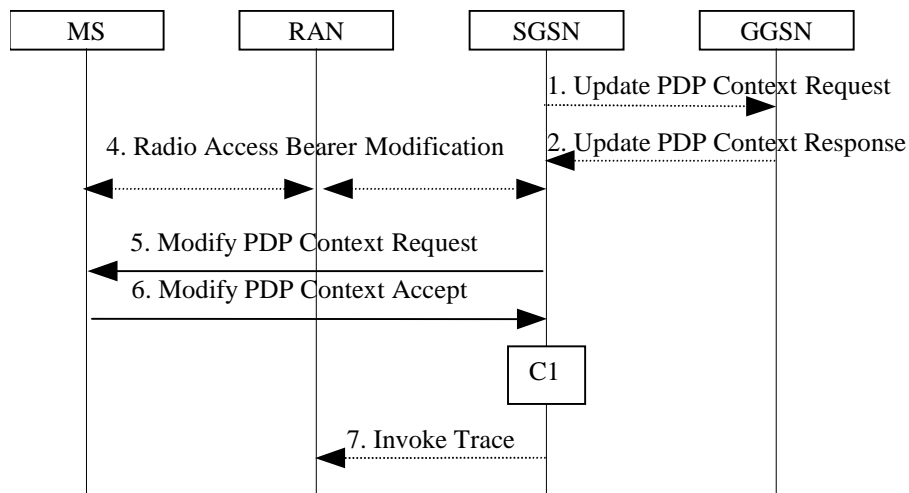


Figure 70b: SGSN-Initiated PDP Context Modification Procedure, Iu mode

- 1) The SGSN may send an Update PDP Context Request (TEID, NSAPI, QoS Negotiated, Trace Reference, Trace Type, Trigger Id, OMC Identity, serving network identity) message to the GGSN. The SGSN shall send the serving network identity to the GGSN. If QoS Negotiated received from the SGSN is incompatible with the PDP context being modified, the GGSN rejects the Update PDP Context Request. The GGSN operator configures the compatible QoS profiles. The SGSN shall include Trace Reference, Trace Type, Trigger Id, and OMC Identity in the message if GGSN trace is activated while the PDP context is active. The SGSN shall copy Trace Reference, Trace Type, and OMC Identity from the trace information received from the HLR or OMC.
- 2) The GGSN may restrict QoS Negotiated given its capabilities and the current load. The GGSN stores QoS Negotiated and returns an Update PDP Context Response (TEID, QoS Negotiated, Prohibit Payload

Compression, APN Restriction, Cause) message. The Prohibit Payload Compression indicates that the SGSN should negotiate no data compression for this PDP context.

- 3) In A/Gb mode, BSS packet flow context procedures may be executed. These procedures are defined in clause "BSS Context".
- 4) In Iu mode, radio access bearer modification may be performed by the RAB Assignment procedure.
- 5) The SGSN selects Radio Priority and Packet Flow Id based on QoS Negotiated, and may send a Modify PDP Context Request (TI, QoS Negotiated, Radio Priority, Packet Flow Id) message to the MS. If the MS indicated in the MS Network Capability it does not support BSS packet flow procedures ~~or if the BSS does not support BSS packet flow procedures~~, then the SGSN shall not include the Packet Flow Id. In A/Gb mode, the QoS Negotiated shall take into account the Aggregate BSS QoS Profile, if any, returned from the BSS.
- 6) The MS acknowledges by returning a Modify PDP Context Accept message. If the MS does not accept the new QoS Negotiated it shall instead de-activate the PDP context with the PDP Context Deactivation Initiated by the MS procedure.
- 7) If BSS trace is activated while the PDP context is active, the SGSN shall send an Invoke Trace (Trace Reference, Trace Type, Trigger Id, OMC Identity) message to the RAN. Trace Reference, and Trace Type are copied from the trace information received from the HLR or OMC.

If an APN Restriction is received from the GGSN for this PDP Context, then the SGSN shall store this value for the PDP Context, replacing any previously stored value for this PDP context. The SGSN shall determine a (new) value for the Maximum APN Restriction using any stored APN Restriction and the received APN Restriction.

The CAMEL procedure calls shall be performed, see referenced procedure in 3GPP TS 23.078:

- C1) CAMEL_GPRS_Change_Of_QoS.

The procedure returns as result "Continue".

9.2.3.2 GGSN-Initiated PDP Context Modification Procedure

The GGSN-Initiated PDP Context Modification procedure is illustrated in Figures 71a and 71b.

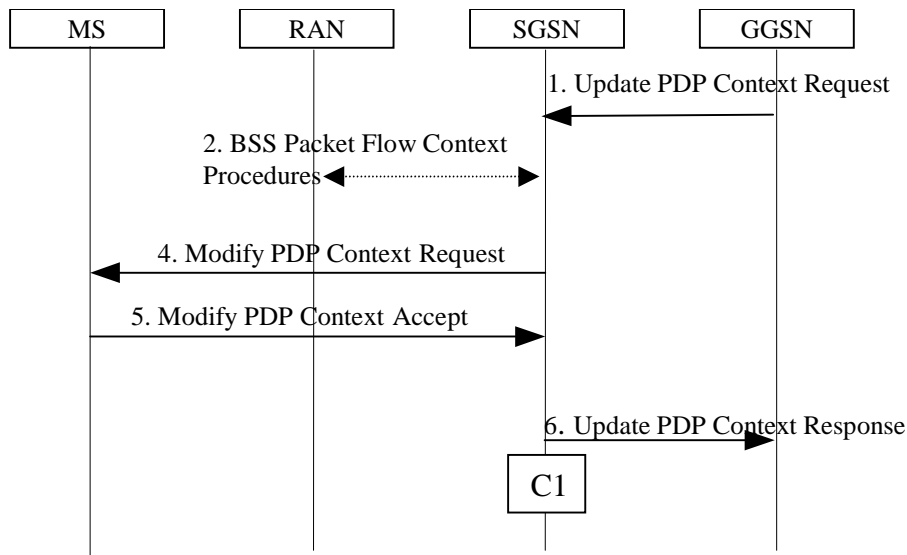


Figure 71a: GGSN-Initiated PDP Context Modification Procedure, A/Gb mode

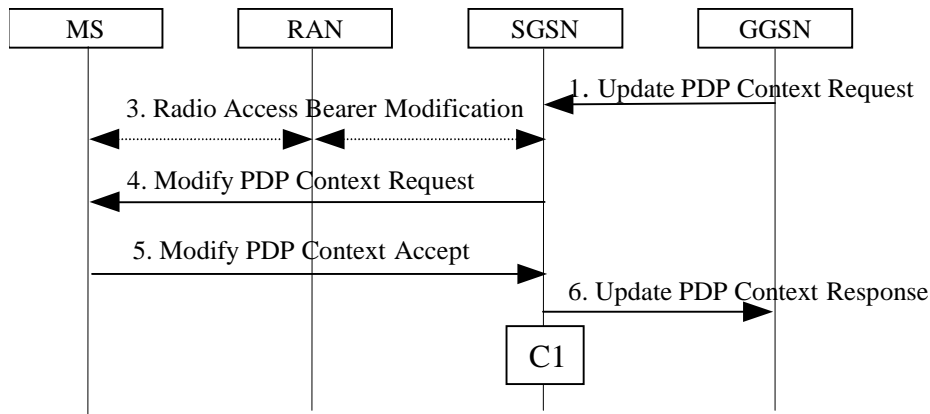


Figure 71b: GGSN-Initiated PDP Context Modification Procedure, Iu mode

- 1) The GGSN sends an Update PDP Context Request (TEID, NSAPI, PDP Address, QoS Requested, Prohibit Payload Compression, APN Restriction) message to the SGSN. QoS Requested indicates the desired QoS profile. PDP Address is optional. The Prohibit Payload Compression indicates that the SGSN should negotiate no data compression for this PDP context. The SGSN may restrict the desired QoS profile given its capabilities, the current load, the current QoS profile, and the subscribed QoS profile.
- 2) In A/Gb mode, BSS packet flow context procedures may be executed. These procedures are defined in clause "BSS Context".
- 3) In Iu mode, radio access bearer modification may be performed by the RAB Assignment procedure.
- 4) The SGSN selects Radio Priority and Packet Flow Id based on QoS Negotiated, and sends a Modify PDP Context Request (TI, PDP Address, QoS Negotiated, Radio Priority, Packet Flow Id) message to the MS. PDP Address is optional. If the MS indicated in the MS Network Capability it does not support BSS packet flow procedures ~~or if the BSS does not support BSS packet flow procedures~~, then the SGSN shall not include the Packet Flow Id. In A/Gb mode, the QoS Negotiated shall take into account the Aggregate BSS QoS Profile, if any, returned from the BSS.
- 5) The MS acknowledges by returning a Modify PDP Context Accept message. If the MS does not accept the new QoS Negotiated it shall instead de-activate the PDP context with the PDP Context Deactivation Initiated by MS procedure.
- 6) Upon receipt of the Modify PDP Context Accept message, or upon completion of the RAB modification procedure, the SGSN returns an Update PDP Context Response (TEID, QoS Negotiated) message to the GGSN. If the SGSN receives a Deactivate PDP Context Request message, it shall instead follow the PDP Context Deactivation Initiated by MS procedure.

If an APN Restriction is received from the GGSN for this PDP Context, then the SGSN shall store this value for the PDP Context, replacing any previously stored value for this PDP context. The SGSN shall determine a (new) value for the Maximum APN Restriction using any stored APN Restriction and the received APN Restriction.

The CAMEL procedure calls shall be performed, see referenced procedure in 3GPP TS 23.078:

C1) CAMEL_GPRS_Change_Of_QoS.

The procedure returns as result "Continue".

9.2.3.3 MS-Initiated PDP Context Modification Procedure

The MS-Initiated PDP Context Modification procedure is illustrated in Figures 72a and 72b.

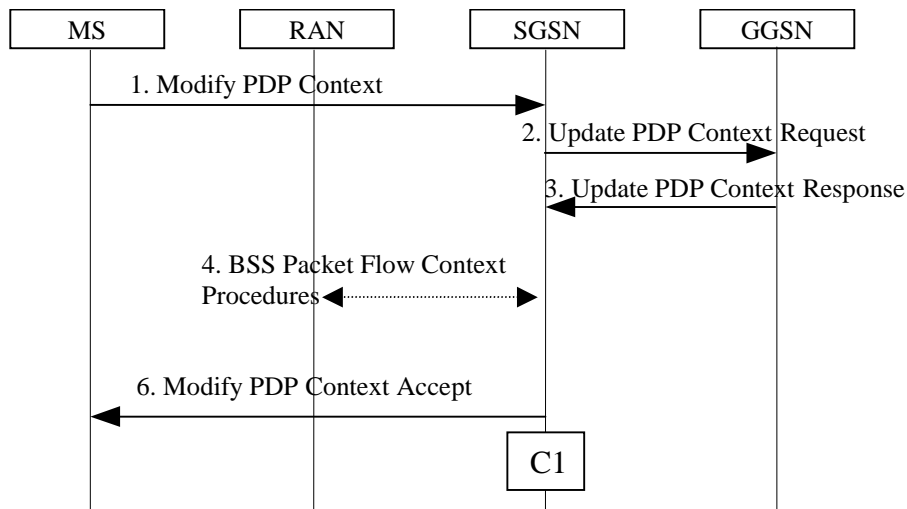


Figure 72a: MS-Initiated PDP Context Modification Procedure, A/Gb mode

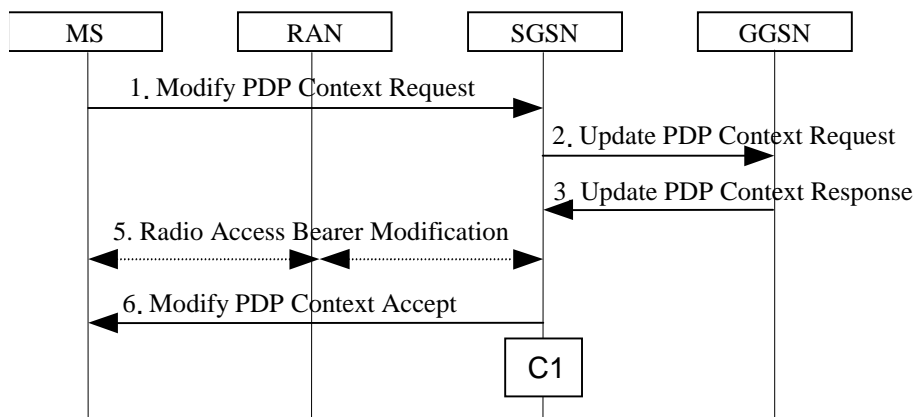


Figure 72b: MS-Initiated PDP Context Modification Procedure, Iu mode

- 1) The MS sends a Modify PDP Context Request (TI, QoS Requested, TFT, PDP Configuration Options) message to the SGSN. Either QoS Requested or TFT or both may be included. QoS Requested indicates the desired QoS profile, while TFT indicates the TFT that is to be added or modified or deleted from the PDP context. PDP Configuration Options may be used to transfer optional PDP parameters and/or requests to the GGSN.
- 2) The SGSN may restrict the desired QoS profile given its capabilities, the current load, and the subscribed QoS profile. The SGSN sends an Update PDP Context Request (TEID, NSAPI, QoS Negotiated, TFT, PDP Configuration Options, serving network identity, CGI/SAI) message to the GGSN. The SGSN shall send the serving network identity to the GGSN. If QoS Negotiated and/or TFT received from the SGSN is incompatible with the PDP context being modified (e.g., TFT contains inconsistent packet filters), the GGSN rejects the Update PDP Context Request. The GGSN operator configures the compatible QoS profile. PDP Configuration Options is sent transparently through the SGSN if received in Modify PDP Context Request message.
- 3) The GGSN may further restrict QoS Negotiated given its capabilities, operator policies and the current load. The GGSN stores QoS Negotiated, stores, modifies, or deletes TFT of that PDP context as indicated in TFT, and returns an Update PDP Context Response (TEID, QoS Negotiated, PDP Configuration Options, Prohibit Payload Compression, APN Restriction) message. PDP Configuration Options may be used to transfer optional PDP parameters to the UE. The Prohibit Payload Compression indicates that the SGSN should negotiate no data compression for this PDP context.
- 4) In A/Gb mode, BSS packet flow context procedures may be executed. These procedures are defined in clause "BSS Context".

- 5) In Iu mode, radio access bearer modification may be performed by the RAB Assignment procedure. In case the radio access bearer does not exist the RAB setup is done by the RAB Assignment procedure.
- 6) The SGSN selects Radio Priority and Packet Flow Id based on QoS Negotiated, and returns a Modify PDP Context Accept (TI, QoS Negotiated, Radio Priority, Packet Flow Id, PDP Configuration Options) message to the MS. If the MS indicated in the MS Network Capability it does not support BSS packet flow procedures ~~or if the BSS does not support BSS packet flow procedures~~, then the SGSN shall not include the Packet Flow Id. In A/Gb mode, the QoS Negotiated shall take into account the Aggregate BSS QoS Profile, if any, returned from the BSS. PDP Configuration Options is sent transparently through the SGSN if received in Modify PDP Context Response message.

NOTE1: If the SGSN does not accept QoS Requested, then steps 2 and 3 of this procedure are skipped, and the existing QoS Negotiated is returned to the MS in step 4.

NOTE2: In this release of the standards no procedure is defined that uses the Protocol Configuration Options in the PDP context modification procedure.

If an APN Restriction is received from the GGSN for this PDP Context, then the SGSN shall store this value for the PDP Context, replacing any previously stored value for this PDP context. The SGSN shall determine a (new) value for the Maximum APN Restriction using any stored APN Restriction and the received APN Restriction.

The CAMEL procedure calls shall be performed, see referenced procedure in 3GPP TS 23.078:

- C1) CAMEL_GPRS_Change_Of_QoS.

The procedure returns as result "Continue".