3GPP TSG_CN#7 **NP-000099**
ETSI SMG3 Plenary Meeting #7,
Madrid, Spain
13th – 15th March 2000

Agenda item: **5.1.3**

Source: **TSG_N WG1**

Title: **CRs to 3G Work Item Quality of Service**

Introduction:

This document contains **"3"** CRs on **Work Item QoS,** that have been agreed by **TSG_N WG1,** and are forwarded to **TSG_N Plenary** meeting #7 for approval.

Tdoc	Spec	CR	Rev	CAT	Rel.	Old Ver	New Ver	Subject
N1-000184	24.008	CR113	1	F	R99	3.2.1	3.3.0	Abnormal cases for TFT handling, TFT IE maximum length
N1-000559	24.008	CR 114	3	C	R99	3.2.1	3.3.0	Compact coding of QoS IE
N1-000508	24.008	CR162	1	F	R99	3.2.1	3.3.0	Deletion/modification of primary PDP context

3GPP/SMG Meeting #10
Abiko, Japan, 11 - 14 January.2000

***Document* N1-0000184**
Rev of N1-000087 *e.g. for 3GPP use the format TP-99xxx or for SMG, use the format P-99-xxx*

CHANGE REQUEST

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24.008	CR	113 r1	Current Version:	3.2.1

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: TSGN#7 *list expected approval meeting # here ↑*	for approval	X	strategic		*(for SMG use only)*
	for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)*	(U)SIM		ME	X	UTRAN / Radio		Core Network	X

Source: CN1 **Date:** 14.January 2000

Subject: Abnormal cases for TFT handling, TFT IE maximum length

Work item: Enhanced QoS support in GPRS

Category: *(only one category shall be marked with an X)*			**Release:**	
F	Correction		Phase 2	
A	Corresponds to a correction in an earlier release		Release 96	
B	Addition of feature		Release 97	
C	Functional modification of feature	X	Release 98	
D	Editorial modification		Release 99	X
			Release 00	

Reason for change:

This CR introduces two pieces of missing information related to the use of TFTs:

1) Abnormal cases involving TFTs. For this purpose, 2 existing cause codes are redefined and two additional cause codes are introduced.

2) TFT IE maximum length. Currently this is indicated as FFS. It is proposed that TFT IE maximum length is set as 257 bytes, restricted by the length octet. This permits to include 7 maximum size IPv4 type packet filters (each of which can have a maximum size of 32 bytes), plus the last packet filter that can contain max 30 octets, i.e. not all components can be defined in one message. This maximum length of 257 will permit the inclusion of 4 maximum size IPv6 type packet filters (plus 14 octets of the 5.th packet filter), each of which can have a maximum size of 60 bytes. 257 bytes give future expantion flexibility in the messages defined to 400 as max size.

Clauses affected: 6.1.3.2.1, 6.1.3.2.2, 6.1.3.2.3, 6.1.3.3.3, 9.5.4, 9.5.10, 10.5.6.6, 10.5.6.12, I.1

Other specs affected:			
Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments: The NOTE in 6.1.3.2.1 should change style. No marking is visible by the change from heading 5 to normal.

<--------- double-click here for help and instructions on how to create a CR.

6.1.3.2.1 Successful Secondary PDP Context Activation Initiated by the MS

In order to request a secondary PDP context activation, the MS shall send an ACTIVATE SECONDARY PDP CONTEXT REQUEST message to the network, enter the state PDP-ACTIVE-PENDING and start timer T3380. The message shall contain the selected NSAPI. The MS shall ensure that the selected NSAPI is not currently being used by another Session Management entity in the MS. The message shall also include a QoS profile, a TFT, a requested LLC SAPI and the Linked TI. The QoS profile is the requested QoS. The TFT shall be sent transparently through the SGSN to the GGSN to enable packet classification and policing for downlink data transfer.

Upon receipt of an ACTIVATE SECONDARY PDP CONTEXT REQUEST, the network shall validate the message by verifying the TI given in the Linked TI IE. The same GGSN address shall be used by the SGSN as for the already established PDP context(s) for that PDP address. The network shall select a radio priority level based on the QoS negotiated and shall reply with an ACTIVATE SECONDARY PDP CONTEXT ACCEPT message, if the request can be accepted.

Upon receipt of the message ACTIVATE SECONDARY PDP CONTEXT ACCEPT, the MS shall stop timer T3380 and enter the state PDP-ACTIVE. If the offered QoS parameters received from the network differ from the QoS requested by the MS, the MS shall either accept the negotiated QoS or initiate the PDP context deactivation procedure.

In GSM the MS shall initiate establishment of the logical link for the LLC SAPI indicated by the network with the offered QoS and selected radio priority level if no logical link has been already established for that SAPI. If the LLC SAPI indicated by the network can not be supported by the MS, the MS shall initiate the PDP context deactivation procedure.

In UMTS, both SGSN and MS shall store the LLC SAPI and the radio priority in the PDP context. If a UMTS to GSM Routing Area Update is performed, the new SGSN shall initiate establishment of the logical link using the negotiated LLC SAPI, the negotiated QoS profile and selected radio priority level stored in the PDP context as in a GSM to GSM Routing Area Update.

An MS, which is capable of operating in both GSM and UMTS, shall use a valid LLC SAPI, while an MS which is capable of operating only in UMTS shall indicate the LLC SAPI value as "LLC SAPI not assigned" in order to avoid unnecessary value range checking and any other possible confusion in the network.

NOTE: The radio priority level and the LLC SAPI parameters, though not used in UMTS, shall be included in the messages, in order to support handover between UMTS and GSM networks.

6.1.3.2.2 Unsuccessful Secondary PDP Context Activation initiated by the MS

Upon receipt of an ACTIVATE SECONDARY PDP CONTEXT REQUEST message, the network may reject the MS initiated secondary PDP context activation by sending an ACTIVATE SECONDARY PDP CONTEXT REJECT message to the MS. The message shall contain a cause code that typically indicates one of the following:

26: insufficient resources;
30: activation rejected by GGSN;
31: activation rejected, unspecified;
32: service option not supported;
33: requested service option not subscribed;
34: service option temporarily out of order;
35: NSAPI already used;
41: ~~TFT already used~~semantic error in the TFT operation;
42: ~~invalid TFT~~syntactical error in the TFT operation;
43: unknown PDP context;
44: semantic errors in packet filter(s);
45: syntactical errors in packet filter(s);
95 - 111: protocol errors.

Upon receipt of an ACTIVATE SECONDARY PDP CONTEXT REJECT message, the MS shall stop timer T3380 and enter the state PDP-INACTIVE.

6.1.3.2.3 Abnormal cases

The following abnormal cases can be identified:

a) Expiry of timers

On the first expiry of the timer T3380, the MS shall resent the ACTIVATE SECONDARY PDP CONTEXT REQUEST and shall reset and restart timer T3380. This retransmission is repeated four times, i.e. on the fifth expiry of timer T3380, the MS shall release all resources possibly allocated for this invocation and shall abort the procedure; no automatic PDP context activation re-attempt shall be performed.

b) MS initiated Secondary PDP context activation for an already activated Secondary PDP context (On the network side)

If all parameters of the new ACTIVATE SECONDARY PDP CONTEXT REQUEST message match with those of a previously activated PDP context, the network shall reply with an ACTIVATE SECONDARY PDP CONTEXT ACCEPT message.

Otherwise, the network shall check the parameters as follows:

The ~~SGSN~~network shall first check whether there is an activated PDP context for the TI given in the Linked TI IE in the ACTIVATE SECONDARY PDP CONTEXT REQUEST message. If there is no active PDP context for the specified TI, the network shall reply with an ACTIVATE SECONDARY PDP CONTEXT REJECT message, cause code indicating "unknown PDP context". If there exists a PDP context for the given TI, then the requested NSAPI is checked. If there exists an active PDP context with the same NSAPI, the network shall reject the activation with cause "NSAPI already used". Otherwise, the TFT in the request message is checked for different types of TFT IE errors as follows:

a) Semantic errors in TFT operations:

I. When the *TFT operation* is an operation other than “Create a new TFT”.

The network shall reject the activation request with cause "semantic error in the TFT operation".

b) Syntactical errors in TFT operations:

I. When the *TFT operation* = “Create a new TFT” and the packet filter list in the TFT IE is empty.

II. When there are other types of syntactical errors in the coding of the TFT IE, such as a mismatch between the number of packet filters subfield, and the number of packet filters in the packet filter list.

The network shall reject the activation request with cause "syntactical error in the TFT operation".

c) Semantic errors in packet filters:

When a packet filter consists of conflicting packet filter components which would render the packet filter ineffective, i.e., no IP packet will ever fit this packet filter. How the network determines a semantic error in a packet filter is outside the scope of this specification.

The network shall reject the activation request with cause "semantic errors in packet filter(s)".

d) Syntactical errors in packet filters:

I. When the *TFT operation* = “Create a new TFT” and two or more packet filters in the resultant TFT would have identical packet filter identifiers.

II. When the *TFT operation* = “Create a new TFT” and two or more packet filters in all TFTs associated with this PDP address would have identical packet filter precedence values.

III. When there are other types of syntactical errors in the coding of packet filters, such as the use of a reserved value for a packet filter component identifier.

The network shall reject the activation request with cause "syntactical errors in packet filter(s)".

~~. If the TFT is invalid, the network shall reject the activation request with cause "Invalid TFT". If the TFT is valid but it is already used by another context of the same PDP address, the network shall reject the activation request with cause "TFT already used".~~

Otherwise, the network shall accept the activation request by replying to the MS with an ACTIVATE SECONDARY PDP CONTEXT ACCEPT message.

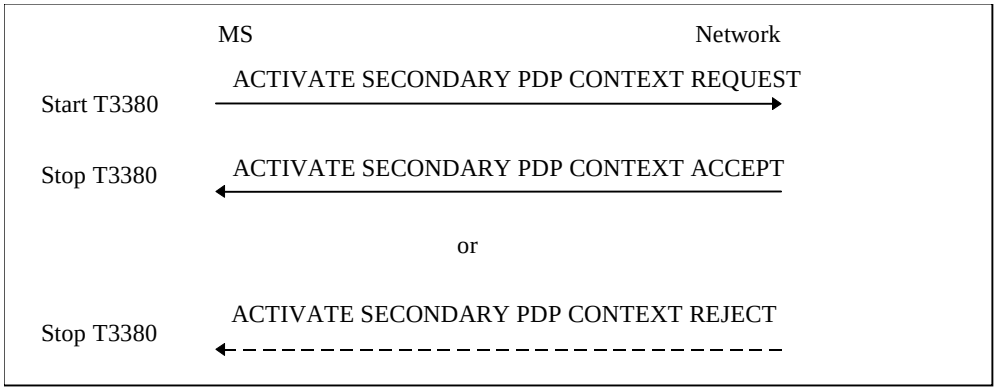

Figure 6.5/TS 24.008: MS initiated secondary PDP context activation procedure

6.1.3.3 PDP context modification procedure

The PDP context modification procedure is invoked by the network or by the MS, in order to change the QoS negotiated, the Radio priority level, or the TFT, negotiated during the PDP context activation procedure, the secondary PDP context activation procedure or at previously performed PDP context modification procedures. The procedure can be initiated by the network or the MS at any time when a PDP context is active.

The network requested PDP context modification procedure may also be used to update the PDP address when external PDN address allocation is performed, in which case the MS receives the PDP address in the MODIFY PDP CONTEXT REQUEST (Network to MS direction) message.

NOTE: The procedure may be initiated by the network due to an inter-SGSN Routing Area Updating when a PDP context is active.

6.1.3.3.3 MS initiated PDP Context Modification not accept by the network

Upon receipt of a MODIFY PDP CONTEXT REQUEST message, the network may reject the MS initiated PDP context modification request by sending a MODIFY PDP CONTEXT REJECT message to the MS. The message shall contain a cause code that typically indicates one of the following:

26: insufficient resources;
41: semantic error in the TFT operation;
42: syntactical error in the TFT operation;
44: semantic errors in packet filter(s);
45: syntactical errors in packet filter(s);

~~# 83: invalid TFT;~~
95 - 111: protocol errors.

The TFT in the request message is checked for different types of TFT IE errors as follows:

a) Semantic errors in TFT operations:

I. *TFT operation* = “Create a new TFT” when there is already an existing TFT for the PDP context.

II. When the *TFT operation* is an operation other than “Create a new TFT” and there is no TFT for the PDP context.

III. *TFT operation* = “Delete existing TFT” when there is already another PDP context without a TFT.

IV. *TFT operation* = “Delete packet filters from existing TFT” when it would render the TFT empty.

The network shall reject the activation request with cause "semantic error in the TFT operation".

b) Syntactical errors in TFT operations:

I. When the *TFT operation* is an operation other than “Delete existing TFT” and the packet filter list in the TFT IE is empty.

II. *TFT operation* = “Delete existing TFT” with a non-empty packet filter list in the TFT IE.

III. *TFT operation* = "Replace packet filters in existing TFT" when a to be replaced packet filter does not exist in the original TFT.

IV. *TFT operation* = "Delete packet filters from existing TFT" when a to be deleted packet filter does not exist in the original TFT.

V. *TFT operation* = "Delete packet filters from existing TFT" with a packet filter list including packet filters instead of packet filter identifiers.

VI. When there are other types of syntactical errors in the coding of the TFT IE, such as a mismatch between the number of packet filters subfield, and the number of packet filters in the packet filter list.

The network shall reject the activation request with cause "syntactical error in the TFT operation".

c) Semantic errors in packet filters:

When a packet filter consists of conflicting packet filter components which would render the packet filter ineffective, i.e., no IP packet will ever fit this packet filter. How the network determines a semantic error in a packet filter is outside the scope of this specification.

The network shall reject the activation request with cause "semantic errors in packet filter(s)".

d) Syntactical errors in packet filters:

I. When the *TFT operation* = "Create a new TFT" or "Add packet filters to existing TFT" and two or more packet filters in the resultant TFT would have identical packet filter identifiers.

II. When the *TFT operation* = "Create a new TFT" or "Add packet filters to existing TFT" or "Replace packet filters in existing TFT" and two or more packet filters in all TFTs associated with this PDP address would have identical packet filter precedence values.

VII. When there are other types of syntactical errors in the coding of packet filters, such as the use of a reserved value for a packet filter component identifier.

The network shall reject the activation request with cause "syntactical errors in packet filter(s)".

Upon receipt of a MODIFY PDP CONTEXT REJECT message, the MS shall stop timer T3381 and enter the state PDP-ACTIVE.

9.5.4 Activate Secondary PDP Context Request

This message is sent by the MS to the network to request activation of a secondary PDP context. See Table 9.5.4/TS 24.008.

Message type: ACTIVATE SECONDARY PDP CONTEXT REQUEST

Significance: global

Direction: MS to network

Table 9.5.4/TS 24.008: Activate SECONDARY PDP context request message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	½
	Transaction identifier	Transaction identifier 10.3.2	M	V	½
	Activate secondary PDP context request message identity	Message type 10.4	M	V	1
	Requested NSAPI	Network service access point identifier 10.5.6.2	M	V	1

	Requested LLC SAPI	LLC service access point identifier 10.5.6.9	M	V	1
	Requested QoS	Quality of service 10.5.6.5	M	LV	FFS
	TFT	Traffic Flow Template 10.5.6.12	M	LV	~~FFS~~256
	Linked TI	Linked TI 10.5.6.7	M	LV	2-3

9.5.10 Modify PDP context request (MS to network direction)

This message is sent by the MS to the network to request modification of an active PDP context. See table 9.5.10/TS 24.008.

Message type: MODIFY PDP CONTEXT REQUEST (MS TO NETWORK DIRECTION)

Significance: global

Direction: MS to network

Table 9.5.10/TS 24.008: modify PDP context request (MS to network direction) message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2
	Modify PDP context request message identity	Message type 10.4	M	V	1
32	Requested LLC SAPI	LLC service access point identifier 10.5.6.9	O	TV	2
30	Requested new QoS	Quality of service 10.5.6.5	O	TLV	FFS
31	New TFT	Traffic Flow Template 10.5.6.12	O	TLV	~~FFS~~257

9.5.10.1 Requested LLC SAPI

This IE may be included in the message to request a new LLC SAPI if a new QoS is requested.

9.5.10.2 Requested new QoS

This IE may be included in the message to request a modification of the QoS.

9.5.10.3 New TFT

This IE is included in the message only when the modification applies to a secondary PDP context (FFS), to request modification of the TFT.

10.5.6.6 SM cause

The purpose of the *SM cause* information element is to indicate the reason why a session management request is rejected.

The *SM cause* is a type 3 information element with 2 octets length.

The *SM cause* information element is coded as shown in figure 10.5.139/TS 24.008 and table 10.5.157/TS 24.008.

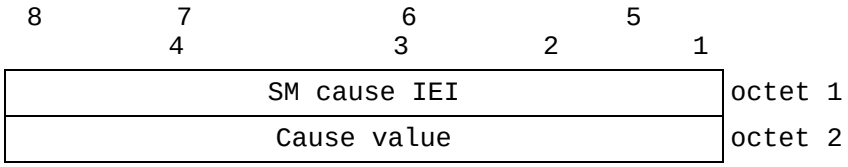

Figure 10.5.139/TS 24.008: *SM cause* information element

Table 10.5.157/TS 24.008: *SM cause* information element

Cause value (octet 2) Bits 8 7 6 5 4 3 2 1	
0 0 0 1 1 0 0 1	LLC or SNDCP failure(GSM only)
0 0 0 1 1 0 1 0	Insufficient resources
0 0 0 1 1 0 1 1	Missing or unknown APN
0 0 0 1 1 1 0 0	Unknown PDP address or PDP type
0 0 0 1 1 1 0 1	User Aauthentication failed
0 0 0 1 1 1 1 0	Activation rejected by GGSN
0 0 0 1 1 1 1 1	Activation rejected, unspecified
0 0 1 0 0 0 0 0	Service option not supported
0 0 1 0 0 0 0 1	Requested service option not subscribed
0 0 1 0 0 0 1 0	Service option temporarily out of order
0 0 1 0 0 0 1 1	NSAPI already used
0 0 1 0 0 1 0 0	Regular deactivation
0 0 1 0 0 1 0 1	QoS not accepted
0 0 1 0 0 1 1 0	Network failure
0 0 1 0 0 1 1 1	Reactivation required
0 0 1 0 1 0 0 1	~~TFT already used~~Semantic error in the TFT operation
0 0 1 0 1 0 1 ~~0~~1	~~Invalid TFT~~Syntactical error in the TFT operation
0 0 1 0 1 ~~0~~1 ~~1~~0 ~~1~~0	Unknown PDP context
0 0 1 0 1 1 0 0	Semantic errors in packet filter(s)
0 0 1 0 1 1 0 1	Syntactical errors in packet filter(s)
0 1 0 1 0 0 0 1	Invalid transaction identifier value
0 1 0 1 1 1 1 1	Semantically incorrect message
0 1 1 0 0 0 0 0	Invalid mandatory information
0 1 1 0 0 0 0 1	Message type non-existent or not implemented
0 1 1 0 0 0 1 0	Message type not compatible with the protocol state
0 1 1 0 0 0 1 1	Information element non-existent or not implemented
0 1 1 0 0 1 0 0	Conditional IE error
0 1 1 0 0 1 0 1	Message not compatible with the protocol state
0 1 1 0 1 1 1 1	Protocol error, unspecified
Any other value received by the mobile station shall be treated as 0010 0010, 'Service option temporarily out of order'. Any other value received by the network shall be treated as 0110 1111, 'Protocol error, unspecified'.	
NOTE: The listed cause values are defined in Annex I	

10.5.6.12 Traffic Flow Template

The purpose of the *traffic flow template* information element is to specify the TFT parameters and operations for a PDP context.

The *traffic flow template* is a type 4 information element with a minimum length of 3 octets. ~~[FFS: No upper length limit is specified except for that given by the maximum number of octets in a L3 message.]~~The maximum length for the IE is 257 octets.

NOTE: The IE length restriction is due to the maximum length that can be encoded in a single length octet.

NOTE: A maximum size IPv4 packet filter can be 32 bytes. Therefore, 7 maximum size IPv4 type packet filters, plus the last packet filter which can contain max 30 octets can fit into one TFT, i.e. if needed not all packet filter components can be defined into one message. A maximum size Ipv6 packet filter can be 60 bytes. Therefore, only 4 maximum size IPv6 packet filters can fit into one TFT. However, using “Add packet filters to existing TFT”, it’s possible to create a TFT including 8 maximum size Ipv4 or IPv6 filters.

The *traffic flow template* information element is coded as shown in Figure 10.5.144/TS 24.008 and Table 10.5.162/TS 24.008.

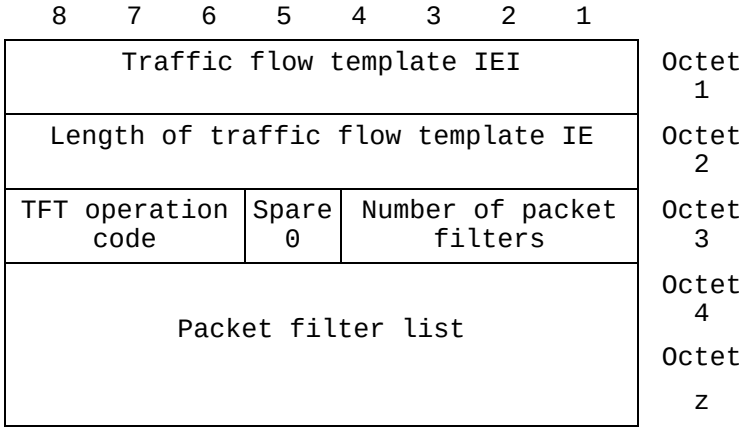

Figure 10.5.144/TS 24.008: *Traffic flow template* information element

Annex I (informative): GPRS specific cause values for session management

This annex is informative.

I.1 Causes related to nature of request

Cause value = 25 LLC or SNDCP failure (GSM only)

This cause code is used by the MS indicate that a PDP context is deactivated because of a LLC or SNDCP failure (e.g. if the SM receives a *SNSM-STATUS.request* message with cause "*DM received* " or " *invalid XID response* ", see GSM 04.65 [78])

Cause value = 26 Insufficient resources

This cause code is used by the MS or by the network to indicate that a PDP context activation request Secondary PDP context activation request or PDP context modification request cannot be accepted due to insufficient resources.

Cause value = 27 Unknown or missing access point name

This cause code is used by the network to indicate that the requested service was rejected by the external packet data network because the access point name was not included although required or if the access point name could not be resolved.

Cause value = 28 Unknown PDP address or PDP type

This cause code is used by the network to indicate that the requested service was rejected by the external packet data network because the PDP address or type could not be recognised.

Cause value = 29 User authentication failed

This cause code is used by the network to indicate that the requested service was rejected by the external packet data network due to a failed user authentication.

Cause value = 30 Activation rejected by GGSN

This cause code is used by the network to indicate that the requested service was rejected by the GGSN.

Cause value = 31 Activation rejected, unspecified

This cause code is used by the network to indicate that the requested service was rejected due to unspecified reasons.

Cause value = 32 Service option not supported

This cause code is used by the network when the MS requests a service which is not supported by the PLMN.

Cause value = 33 Requested service option not subscribed

See Annex G, section 4.

Cause value = 34 Service option temporarily out of order

See Annex G, section 4.

Cause value = 35 NSAPI already used

This cause code is used by the network to indicate that the NSAPI requested by the MS in the PDP context activation or Secondary PDP context activation request is already used by another active PDP context of this MS.

Cause value = 36 Regular PDP context deactivation

This cause code is used to indicate a regular MS or network initiated PDP context deactivation.

Cause value = 37 QoS not accepted

This cause code is used by the MS if the new QoS cannot be accepted that were indicated by the network in the PDP Context Modification procedure.

Cause value = 38 Network failure

This cause code is used by the network to indicate that the PDP context deactivation is caused by an error situation in the network.

Cause value = 39 Reactivation requested

This cause code is used by the network to request a PDP context reactivation after a GGSN restart.

Cause value = 40 Feature not supported

This cause code is used by the MS to indicate that the PDP context activation initiated by the network is not supported by the MS.

Cause value = 41 semantic error in the TFT operation~~TFT already used~~

This cause code is used by the network to indicate that there is a semantic error in the TFT operation included in a secondary PDP context activation request or an MS-initiated PDP context modification.~~the TFT indicated in the secondary PDP context activation request is already used.~~

Cause value = 42 syntactical error in the TFT operation~~invalid TFT~~

This cause code is used by the network to indicate that there is a syntactical error in the TFT operation included in a secondary PDP context activation request or an MS-initiated PDP context modification.~~the TFT indicated in the secondary PDP context activation request is invalid.~~

Cause value = 43 unknown PDP context

This cause code is used by the network to indicate that the primary PDP context specified in the secondary PDP context activation request is not active.

Cause value = 44 semantic errors in packet filter(s)

This cause code is used by the network to indicate that there is one or more semantic errors in packet filter(s) of the TFT included in a secondary PDP context activation request or an MS-initiated PDP context modification.

Cause value = 45 syntactical error in packet filter(s)

This cause code is used by the network to indicate that there is one or more syntactical errors in packet filter(s) of the TFT included in a secondary PDP context activation request or an MS-initiated PDP context modification.

3GPP/SMG Meeting TSG-CN-WG1
Umea, Sweden, 28 Feb – 03 Mar 2000

Document N1-000559
revision of N1-000514

CHANGE REQUEST

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24.008	CR	114 r3	Current Version:	3.2.1

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: CN#7	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑	For information		non-strategic	X	

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [X]

Source: CN1 **Date:** 2000-03-03

Subject: Compact coding of QoS IE

Work item: QoS

Category: *(only one category shall be marked with an X)*

F	Correction		**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature	X		Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change:
With CR 086r1 the new Quality of Service (QoS) information element (IE) for Release 99 was introduced in TS 24.008.
One disadvantage with the proposed coding is that the size of the QoS IE has increased considerably, from 4 bytes in R'97 to 19 in R'99 (LV coding).
This IE is used in several L3 protocol messages. Some of which were quite large already in R'97, thereby increasing the likelihood of an overflow in the messages.
A closer look shows that the IE coding has been made more spacious when necessary.
Considering that the QoS IE is also a major part of e.g. the MODIFY PDP CONTEXT REQUEST message and there are reasons to believe that QoS renegotiation will contribute significantly to the SM signalling in a GPRS network, it seems justified that a more compact coding should be strived for.
With this CR a compact coding for the QoS IE is introduced that will bring down the IE length to 13 octets (12 octets where the IE is mandatory).
QoS IE Length has also been added, were missing, in the tables in section 9.5.

Clauses affected:
9.5 GPRS Session Management Messages
10.5.6.5 Quality of Service.

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other GSM core specifications	[ ]	→ List of CRs:
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

Other comments:
Rev 0 of this CR was based on version 3.2.0 of 24.008. This revision is based on 3.2.1

help.doc

<--------- double-click here for help and instructions on how to create a CR.

2 Normative references

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] GSM 01.02: "Digital cellular telecommunications system (Phase 2+); General description of a GSM Public Land Mobile Network (PLMN)".

[2] GSM 01.04: "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".

[2a] 3G Vocabulary

[3] TS 22.002: "Digital cellular telecommunications system (Phase 2+); Bearer Services (BS) supported by a GSM Public Land Mobile Network (PLMN)".

[4] TS 22.003: "Teleservices supported by a GSM Public Land Mobile Network (PLMN)".

[5] GSM 02.09: "Digital cellular telecommunications system (Phase 2+); Security aspects".

[6] TS 22.011: "Digital cellular telecommunications system (Phase 2+); Service accessibility".

[7] GSM 02.17: "Digital cellular telecommunications system (Phase 2+); Subscriber identity modules Functional characteristics".

[8] GSM 02.40: "Digital cellular telecommunications system (Phase 2+); Procedures for call progress indications".

[9] GSM 03.01: "Digital cellular telecommunications system (Phase 2+); Network functions".

[10] TS 23.003: "Digital cellular telecommunications system (Phase 2+); Numbering, addressing and identification".

[11] GSM 03.13: "Digital cellular telecommunications system (Phase 2+); Discontinuous Reception (DRX) in the GSM system".

[12] TS 23.014: "Digital cellular telecommunications system (Phase 2+); Support of Dual Tone Multi-Frequency signalling (DTMF) via the GSM system".

[12a] TS 23.071: “Digital cellular telecommunications system (Phase 2+); Location Services; Functional description – Stage 2”.

[13] GSM 03.20: "Digital cellular telecommunications system (Phase 2+); Security related network functions".

[14] TS 23.122: "NAS Functions related to Mobile Station (MS) in idle mode".

[15] GSM 04.02: "Digital cellular telecommunications system (Phase 2+); GSM Public Land Mobile Network (PLMN) access reference configuration".

[16] GSM 04.03: "Digital cellular telecommunications system (Phase 2+); Mobile Station - Base Station System (MS - BSS) interface Channel structures and access capabilities".

[17] GSM 04.04: "Digital cellular telecommunications system (Phase 2+); layer 1 General requirements".

[18] GSM 04.05: "Digital cellular telecommunications system (Phase 2+); Data Link (DL) layer General aspects".

[19] GSM 04.06: "Digital cellular telecommunications system (Phase 2+); Mobile Station - Base Station System (MS - BSS) interface Data Link (DL) layer specification".

[20] TS 24.007: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface signalling layer 3 General aspects".

[21] TS 24.010: "Digital cellular telecommunications system ; Mobile radio interface layer 3 Supplementary services specification General aspects".

[22] TS 24.011: "Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface".

[23] TS 24.012: "Short Message Service Cell Broadcast (SMSCB) support on the mobile radio interface".

[23a] TS 24.071: “Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 location services specification.

[23b] GSM 04.31 “Digital cellular telecommunication system (Phse 2+);Location Services;Mobile Station (MS) – Serving Mobile Location Centre (SMLC); Radio Resource LCS Protocol (RRLP)”.

[24] TS 24.080: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 supplementary services specification Formats and coding".

[25] TS 24.081: "Digital cellular telecommunications system (Phase 2+); Line identification supplementary services - Stage 3".

[26] TS 24.082: "Digital cellular telecommunications system (Phase 2+); Call Forwarding (CF) supplementary services - Stage 3".

[27] TS 24.083: "Digital cellular telecommunications system (Phase 2+); Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 3".

[28] TS 24.084: "Digital cellular telecommunications system (Phase 2+); MultiParty (MPTY) supplementary services - Stage 3".

[29] TS 24.085: "Digital cellular telecommunications system (Phase 2+); Closed User Group (CUG) supplementary services - Stage 3".

[30] TS 24.086: "Digital cellular telecommunications system (Phase 2+); Advice of Charge (AoC) supplementary services - Stage 3".

[31] TS 24.088: "Call Barring (CB) supplementary services - Stage 3".

[32] GSM 05.02: "Digital cellular telecommunications system (Phase 2+); Multiplexing and multiple access on the radio path".

[33] GSM 05.05: "Digital cellular telecommunications system (Phase 2+); Radio transmission and reception".

[34] GSM 05.08: "Digital cellular telecommunications system (Phase 2+); Radio subsystem link control".

[35] GSM 05.10: "Digital cellular telecommunications system (Phase 2+); Radio subsystem synchronization".

[36] TS 27.001: "General on Terminal Adaptation Functions (TAF) for Mobile Stations (MS)".

[37] TS 29.002: "Digital cellular telecommunications system (Phase 2+); Mobile Application Part (MAP) specification".

[38] TS 29.007: "Digital cellular telecommunications system (Phase 2+); General requirements on interworking between the Public Land Mobile Network (PLMN) and the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN)".

[39] GSM 11.10: "Digital cellular telecommunications system (Phase 2+); Mobile Station (MS) conformity specification".

[40] GSM 11.21: "Digital cellular telecommunications system (Phase 2); The GSM Base Station System (BSS) equipment specification".

[41] ISO/IEC 646 (1991): "Information technology - ISO 7-bit coded character set for information interchange".

[42] ISO/IEC 6429: "Information technology - Control functions for coded character sets".

[43] ISO 8348 (1987): "Information processing systems - Data communications - Network service definition".

[44] CCITT Recommendation E.163: "Numbering plan for the international telephone service".

[45] CCITT Recommendation E.164: "Numbering plan for the ISDN era".

[46] CCITT Recommendation E.212: "Identification plan for land mobile stations".

[47] ITU-T Recommendation F.69 (1993): "Plan for telex destination codes".

[48] CCITT Recommendation I.330: "ISDN numbering and addressing principles".

[49] CCITT Recommendation I.440 (1989): "ISDN user-network interface data link layer - General aspects".

[50] CCITT Recommendation I.450 (1989): "ISDN user-network interface layer 3 General aspects".

[51] ITU-T Recommendation I.500 (1993): "General structure of the ISDN interworking recommendations".

[52] CCITT Recommendation T.50: "International Alphabet No. 5".

[53] ITU Recommendation Q.931: ISDN user-network interface layer 3 specification for basic control".

[54] CCITT Recommendation V.21: "300 bits per second duplex modem standardized for use in the general switched telephone network".

[55] CCITT Recommendation V.22: "1200 bits per second duplex modem standardized for use in the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits".

[56] CCITT Recommendation V.22bis: "2400 bits per second duplex modem using the frequency division technique standardized for use on the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits".

[57] CCITT Recommendation V.23: "600/1200-baud modem standardized for use in the general switched telephone network".

[58] CCITT Recommendation V.26ter: "2400 bits per second duplex modem using the echo cancellation technique standardized for use on the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits".

[59] CCITT Recommendation V.32: "A family of 2-wire, duplex modems operating at data signalling rates of up to 9600 bit/s for use on the general switched telephone network and on leased telephone-type circuits".

[60] CCITT Recommendation V.110: "Support of data terminal equipments (DTEs) with V-Series interfaces by an integrated services digital network".

[61] CCITT Recommendation V.120: "Support by an ISDN of data terminal equipment with V-Series type interfaces with provision for statistical multiplexing".

[62] CCITT Recommendation X.21: "Interface between data terminal equipment (DTE) and data circuit-terminating equipment (DCE) for synchronous operation on public data networks".

[63] CCITT Recommendation X.25: "Interface between data terminal equipment (DTE) and data circuit-terminating equipment (DCE) for terminals operating in the packet mode and connected to public data networks by dedicated circuit".

[64] CCITT Recommendation X.28: "DTE/DCE interface for a start-stop mode data terminal equipment accessing the packet assembly/disassembly facility (PAD) in a public data network situated in the same country".

[65] CCITT Recommendation X.30: "Support of X.21, X.21 bis and X.20 bis based data terminal equipments (DTEs) by an integrated services digital network (ISDN)".

[66] CCITT Recommendation X.31: "Support of packet mode terminal equipment by an ISDN".

[67] CCITT Recommendation X.32: "Interface between data terminal equipment (DTE) and data circuit-terminating equipment (DCE) for terminals operating in the packet mode and accessing a packet switched public data network through a public switched telephone network or an integrated services digital network or a circuit switched public data network".

[68] CCITT Recommendation X.75 (1988): "Packet-switched signalling system between public networks providing data transmission services".

[69] CCITT Recommendation X.121: "International numbering plan for public data networks".

[70] ETS 300 102-1: "Integrated Services Digital Network (ISDN); User-network interface layer 3 Specifications for basic call control".

[71] ETS 300 102-2: "Integrated Services Digital Network (ISDN); User-network interface layer 3 Specifications for basic call control".

[72] ISO/IEC10646: “Universal Multiple-Octet Coded Character Set (UCS)”; UCS2, 16 bit coding.

[73] TS 22.060: "General Packet Radio Service (GPRS); Service Description; Stage 1".

[74] TS 23.060: "General Packet Radio Service (GPRS); Service Description; Stage 2".

[75] GSM 03.64: "Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Overall description of the GPRS radio interface; Stage 2".

[76] GSM 04.60: "Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Mobile Station - Base Station System (MS-BSS) interface; Radio Link Control and Medium Access Control (RLC/MAC) layer specification".

[77] IETF RFC 1034: "Domain names - Concepts and Facilities " (STD 7).

[78] GSM 04.65: "Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Subnetwork Dependent Convergence Protocol (SNDCP)".

[79] ITU Recommendation I.460: “Multiplexing, rate adaption and support of existing services”.

[80] TS 23.107: “3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; QoS Concept and Architecture”

9.5 GPRS Session Management Messages

9.5.1 Activate PDP context request

This message is sent by the MS to the network to request activation of a PDP context.
See table 9.5.1/TS 24.008.

Message type: ACTIVATE PDP CONTEXT REQUEST

Significance: global

Direction: MS to network

Table 9.5.1/TS 24.008: ACTIVATE PDP CONTEXT REQUEST message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2
	Activate PDP context request message identity	Message type 10.4	M	V	1
	Requested NSAPI	Network service access point identifier 10.5.6.2	M	V	1
	Requested LLC SAPI	LLC service access point identifier 10.5.6.9	M	V	1
	Requested QoS	Quality of service 10.5.6.5	M	LV	~~19~~12
	Requested PDP address	Packet data protocol address 10.5.6.4	M	LV	3 - 19
28	Access point name	Access point name 10.5.6.1	O	TLV	3 - 102
27	Protocol configuration options	Protocol configuration options 10.5.6.3	O	TLV	3 - 253

9.5.1.1 Access point name

This IE is included in the message when the MS selects a specific external network to be connected to.

9.5.1.2 Protocol configuration options

This IE is included in the message when the MS provides protocol configuration options for the external PDN.

9.5.2 Activate PDP context accept

This message is sent by the network to the MS to acknowledge activation of a PDP context.
See table 9.5.2/TS 24.008.

Message type: ACTIVATE PDP CONTEXT ACCEPT

Significance: global

Direction: network to MS

Table 9.5.2/TS 24.008: ACTIVATE PDP CONTEXT ACCEPT message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2
	Activate PDP context accept message identity	Message type 10.4	M	V	1
	Negotiated LLC SAPI	LLC service access point identifier 10.5.6.9	M	V	1
	Negotiated QoS	Quality of service 10.5.6.5	M	LV	~~19~~12
	Radio priority	Radio priority 10.5.7.2	M	V	1/2
	Spare half octet	Spare half octet 10.5.1.8	M	V	1/2
2B	PDP address	Packet data protocol address 10.5.6.4	O	TLV	4 - 20
27	Protocol configuration options	Protocol configuration options 10.5.6.3	O	TLV	3 - 253
34	Packet Flow Identifier	Packet Flow Identifier 10.5.6.11	O	TLV	3

9.5.2.1 PDP address

If the MS did not request a static address in the corresponding ACTIVATE PDP CONTEXT REQUEST message, the network shall include the PDP address IE in this ACTIVATE PDP CONTEXT ACCEPT message.

If the MS requested a static address in the corresponding ACTIVATE PDP CONTEXT REQUEST message, the network shall not include the PDP address IE in this ACTIVATE PDP CONTEXT ACCEPT message.

9.5.2.2 Protocol configuration options

This IE is included in the message when the network wishes to transmit protocol configuration options for the external PDN.

9.5.2.3 Packet Flow Identifier

This IE may be included if the network wants to indicate the Packet Flow Identifier associated to the PDP context.

Next Modified Section

9.5.4 Activate Secondary PDP Context Request

This message is sent by the MS to the network to request activation of a secondary PDP context. See Table 9.5.4/TS 24.008.

Message type: ACTIVATE SECONDARY PDP CONTEXT REQUEST

Significance: global

Direction: MS to network

Table 9.5.4/TS 24.008: Activate SECONDARY PDP context request message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	½
	Transaction identifier	Transaction identifier 10.3.2	M	V	½
	Activate secondary PDP context request message identity	Message type 10.4	M	V	1
	Requested NSAPI	Network service access point identifier 10.5.6.2	M	V	1
	Requested LLC SAPI	LLC service access point identifier 10.5.6.9	M	V	1
	Requested QoS	Quality of service 10.5.6.5	M	LV	~~FFS~~ 12
	TFT	Traffic Flow Template	M	LV	FFS
	Linked TI	Linked TI 10.5.6.7	M	LV	2-3

9.5.5 Activate Secondary PDP Context Accept

This message is sent by the network to the MS to acknowledge activation of a secondary PDP context. See Table 9.5.5/TS 24.008.

Message type: ACTIVATE SECONDARY PDP CONTEXT ACCEPT

Significance: global

Direction: network to MS

Table 9.5.5/TS 24.008: ACTIVATE SECONDARY PDP CONTEXT ACCEPT message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	½
	Transaction identifier	Transaction identifier 10.3.2	M	V	½
	Activate secondary PDP context accept message identity	Message type 10.4	M	V	1
	Negotiated LLC SAPI	LLC service access point identifier 10.5.6.9	M	V	1
	Negotiated QoS	Quality of service 10.5.6.5	M	LV	~~FFS~~ 12
	Radio priority	Radio priority	M	V	½
	Spare half octet	Spare half octet 10.5.1.8	M	V	½
34	Packet Flow Identifier	Packet Flow Identifier 10.5.6.11	O	TLV	3

9.5.5.1 Packet Flow Identifier

This IE may be included if the network wants to indicate the Packet Flow Identifier associated to the PDP context.

Next Modified Section

9.5.9 Modify PDP context request (Network to MS direction)

This message is sent by the network to the MS to request modification of an active PDP context. See table 9.5.9/TS 24.008.

Message type: MODIFY PDP CONTEXT REQUEST (NETWORK TO MS DIRECTION)

Significance: global

Direction: network to MS

Table 9.5.9/TS 24.008: MODIFY PDP CONTEXT REQUEST (NETWORK TO MS DIRECTION) message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2
	Modify PDP context request message identity	Message type 10.4	M	V	1
	Radio priority	Radio priority 10.5.7.2	M	V	1/2
	Spare half octet	Spare half octet 10.5.1.8	M	V	1/2
	Requested LLC SAPI	LLC service access point identifier 10.5.6.9	M	V	1
	New QoS	Quality of service 10.5.6.5	M	LV	~~19~~12
2B	PDP address	Packet data protocol address 10.5.6.4	O	TLV	4-20
34	Packet Flow Identifier	Packet Flow Identifier 10.5.6.11	O	TLV	3

9.5.9.1 PDP address

If the MS requested external PDN address allocation at PDP context activation via an APN and this was confirmed by the network in the ACTIVATE PDP CONTEXT ACCEPT message, then the network shall include the PDP address IE in the MODIFY PDP CONTEXT REQUEST message once the address has been actually allocated, in order to update the PDP context in the MS.

9.5.9.2 Packet Flow Identifier

This IE may be included if the network wants to indicate the Packet Flow Identifier associated to the PDP context.

9.5.10 Modify PDP context request (MS to network direction)

This message is sent by the MS to the network to request modification of an active PDP context. See table 9.5.10/TS 24.008.

Message type: MODIFY PDP CONTEXT REQUEST (MS TO NETWORK DIRECTION)

Significance: global

Direction: MS to network

Table 9.5.10/TS 24.008: modify PDP context request (MS to network direction) message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2
	Modify PDP context request message identity	Message type 10.4	M	V	1
32	Requested LLC SAPI	LLC service access point identifier 10.5.6.9	O	TV	2
30	Requested new QoS	Quality of service 10.5.6.5	O	TLV	~~FFS~~ 13
31	New TFT	Traffic Flow Template	O	TLV	FFS

9.5.10.1 Requested LLC SAPI

This IE may be included in the message to request a new LLC SAPI if a new QoS is requested.

9.5.10.2 Requested new QoS

This IE may be included in the message to request a modification of the QoS.

9.5.10.3 New TFT

This IE is included in the message only when the modification applies to a secondary PDP context (FFS), to request modification of the TFT.

Next Modified Section

9.5.12 Modify PDP context accept (Network to MS direction)

This message is sent by the network to the MS to acknowledge the modification of an active PDP context. See table 9.5.12/TS 24.008.

Message type: MODIFY PDP CONTEXT ACCEPT (NETWORK TO MS DIRECTION)

Significance: global

Direction: Network to MS

Table 9.5.12/TS 24.008: modify PDP context accept (NETWORK to ms direction) message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	~~1/2~~½
	Transaction identifier	Transaction identifier 10.3.2	M	V	~~1/2~~½
	Modify PDP context accept message identity	Message type 10.4	M	V	1
30	Negotiated QoS	Quality of service 10.5.6.5	O	TLV	~~FFS~~ 13
32	Negotiated LLC SAPI	LLC service access point identifier 10.5.6.9	O	TV	2
33	New radio priority	Radio priority 10.5.7.2	O	TV	1
34	Packet Flow Identifier	Packet Flow Identifier 10.5.6.11	O	TLV	3

9.5.12.1 Negotiated QoS

This IE is included in the message if the network assigns a new QoS.

9.5.12.2 Negotiated LLC SAPI

This IE is included in the message if the network assigns a new LLC SAPI.

9.5.12.3 New radio priority

This IE is included in the message only if the network modifies the radio priority.

9.5.12.4 Packet Flow Identifier

This IE may be included if the network wants to indicate the Packet Flow Identifier associated to the PDP context.

Next Modified Section

10.5.6.5 Quality of service

The purpose of the *quality of service* information element is to specify the QoS parameters for a PDP context.

The QoS IE is defined to allow backward compatibility to earlier version of Session Management Protocol.

The *quality of service* is a type 4 information element with a length of ~~20~~13 octets.

The *quality of service* information element is coded as shown in figure 10.5.138/TS 24.008 and table 10.5.156/TS 24.008.

8	7	6 ~~6~~	5	4	3	2	1	
Quality of service IEI								octet 1
Length of quality of service IE								Octet 2
0	0 spare	Delay class			Reliability class			octet 3
Peak throughput				0 spare	Precedence class			octet 4
0	0	0 spare		Mean throughput				octet 5
Traffic Class			~~0 spare~~ Delivery order		Delivery of erroneous SDU			Octet 6
Maximum SDU size								Octet 7 ~~Octet 8~~
Maximum bit rate for uplink								Octet 8~~9~~ ~~Octet 10~~
Maximum bit rate for downlink								Octet 9~~11~~ ~~Octet 12~~
Residual BER			SDU error ratio					Octet 10~~3~~
~~SDU error ratio~~								~~Octet 14~~
Transfer delay					Traffic Handling priority			Octet 11~~5~~
Guaranteed bit rate for uplink								Octet 12~~6~~ ~~Octet 17~~
Guaranteed bit rate for downlink								Octet 13~~8~~ ~~Octet 19~~
~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~ ~~spare~~	~~Traffic handling priority~~		Octet ~~20~~

Figure 10.5.138/TS 24.008: *Quality of service* information element

Table 10.5.156/TS 24.008: *Quality of service* information element

Reliability class, octet 3 (see TS 23.~~060~~107)
Bits
3 2 1
In MS to network direction:
0 0 0 Subscribed reliability class
In network to MS direction:
0 0 0 Reserved
In MS to network direction and in network to MS direction :
0 0 1 Acknowledged GTP, LLC, and RLC; Protected data
0 1 0 Unacknowledged GTP; Acknowledged LLC and RLC, Protected data
0 1 1 Unacknowledged GTP and LLC; Acknowledged RLC, Protected data
1 0 0 Unacknowledged GTP, LLC, and RLC, Protected data
1 0 1 Unacknowledged GTP, LLC, and RLC, Unprotected data
1 1 1 Reserved

All other values are interpreted as *Unacknowledged GTP and LLC; Acknowledged RLC, Protected data* in this version of the protocol.

Delay class, octet 3 (see TS 22.060 and TS 23.~~060~~107)
Bits
6 5 4
In MS to network direction:
0 0 0 Subscribed delay class
In network to MS direction:
0 0 0 Reserved
In MS to network direction and in network to MS direction :
0 0 1 Delay class 1
0 1 0 Delay class 2
0 1 1 Delay class 3
1 0 0 Delay class 4 (best effort)
1 1 1 Reserved
All other values are interpreted as *Delay class 4 (best effort)* in this version of the protocol.
Bit 7 and 8 of octet 3 are spare and shall be coded all 0.
Precedence class, octet 4 (see TS 23.~~060~~107)
Bits
3 2 1
In MS to network direction:
0 0 0 Subscribed precedence
In network to MS direction:
0 0 0 Reserved
In MS to network direction and in network to MS direction :
0 0 1 High priority
0 1 0 Normal priority
0 1 1 Low priority
1 1 1 Reserved

All other values are interpreted as *Normal priority* in this version of the protocol.

Bit 4 of octet 4 is spare and shall be coded as 0.

Peak throughput, octet 4 (see TS 23.107)
Bits
8 7 6 5
In MS to network direction:
0 0 0 0 Subscribed peak throughput
In network to MS direction:
0 0 0 0 Reserved
In MS to network direction and in network to MS direction :
0 0 0 1 Up to 1 000 octet/s
0 0 1 0 Up to 2 000 octet/s
0 0 1 1 Up to 4 000 octet/s
0 1 0 0 Up to 8 000 octet/s
0 1 0 1 Up to 16 000 octet/s
0 1 1 0 Up to 32 000 octet/s
0 1 1 1 Up to 64 000 octet/s
1 0 0 0 Up to 128 000 octet/s
1 0 0 1 Up to 256 000 octet/s
1 1 1 1 Reserved

All other values are interpreted as *Up to 1 000 octet/s* in this version of the protocol.
Mean throughput, octet 5 (see TS 23.107)
Bits
5 4 3 2 1
In MS to network direction:
0 0 0 0 0 Subscribed mean throughput
In network to MS direction:
0 0 0 0 0 Reserved
In MS to network direction and in network to MS direction :
0 0 0 0 1 100 octet/h
0 0 0 1 0 200 octet/h
0 0 0 1 1 500 octet/h
0 0 1 0 0 1 000 octet/h
0 0 1 0 1 2 000 octet/h
0 0 1 1 0 5 000 octet/h
0 0 1 1 1 10 000 octet/h
0 1 0 0 0 20 000 octet/h
0 1 0 0 1 50 000 octet/h
0 1 0 1 0 100 000 octet/h
0 1 0 1 1 200 000 octet/h
0 1 1 0 0 500 000 octet/h
0 1 1 0 1 1 000 000 octet/h
0 1 1 1 0 2 000 000 octet/h
0 1 1 1 1 5 000 000 octet/h
1 0 0 0 0 10 000 000 octet/h
1 0 0 0 1 20 000 000 octet/h
1 0 0 1 0 50 000 000 octet/h
1 1 1 1 0 Reserved
1 1 1 1 1 Best effort
The value Best effort indicates that throughput shall be made available to the MS on a per need and availability basis.
All other values are interpreted as *Best effort* in this version of the protocol.

Bits 8 to 6 of octet 5 are spare and shall be coded all 0.

Delivery of erroneous SDUs, octet 6 (see TS 23.107)
Bits
3 2 1
In MS to network direction:
0 0 0 Subscribed delivery of erroneous SDUs
In network to MS direction:
0 0 0 Reserved
In MS to network direction and in network to MS direction :
0 0 1 No detect ('-')
0 1 0 Erroneous SDUs are delivered ('yes')
0 1 1 Erroneous SDUs are not delivered ('no')
1 1 1 Reserved

~~All other values are reserved.~~
The network shall map all other values not explicitly defined onto one of the values defined in this version of the protocol. The network shall return a negotiated value which is explicitly defined in this version of this protocol.

The MS shall consider all other values as reserved.

Delivery order, octet 6 (see TS 23.107)
Bits
5 4 ~~3~~
In MS to network direction:
0 0 Subscribed delivery order
In network to MS direction:
0 0 Reserved
In MS to network direction and in network to MS direction :
0 1 With delivery order ('yes')
1 0 Without delivery order ('no')
1 1 Reserved

~~All other values are reserved.~~
~~Bit 5 of octet 6 is spare and shall be coded all 0.~~

Traffic class, octet 6 (see TS 23.107)
Bits
8 7 6
In MS to network direction:
0 0 0 Subscribed traffic class
In network to MS direction:
0 0 0 Reserved
In MS to network direction and in network to MS direction :
0 0 1 Conversational class
0 1 0 Streaming class
0 1 1 Interactive class
1 0 0 Background class
1 1 1 Reserved

The network shall map all other values not explicitly defined onto one of the values defined in this version of the protocol. The network shall return a negotiated value which is explicitly defined in this version of this protocol.

The MS shall consider all other values as reserved.

~~All other values are reserved.~~

Maximum SDU size, octet 7 (see TS 23.107)
The Maximum SDU size value is binary coded in 8 bits, using a granularity of 10 octets.
In MS to network direction:
00000000 Subscribed maximum SDU size
11111111 Reserved
In network to MS direction:
00000000 Reserved
11111111 Reserved
In MS to network direction and in network to MS direction :

For values in the range 00000001 to 10010110 the Maximum SDU size value is binary coded in 8 bits, using a granularity of 10 octets, giving a range of values from 10 octets to 1500 octets.
Values above 10010110 are as below:
10010111 1502 octets
10011000 1510 octets

10011001 1520 octets

The network shall map all other values not explicitly defined onto one of the values defined in this version of the protocol. The network shall return a negotiated value which is explicitly defined in this version of this protocol.

The MS shall consider all other values as reserved.

~~Maximum SDU size, octet 7 and 8~~
~~In MS to network direction:~~
~~All bits 1 Subscribed maximum SDU size~~
~~In network to MS direction:~~
~~All bits 1 Reserved~~
~~In MS to network direction and in network to MS direction :~~interpreted as 1502
~~The Maximum SDU size value consists of 16 bits. Refer to TS 23.107 for the maximum value. The granularity is 1 octet.~~

Maximum bit rate for uplink, octet ~~9~~8 ~~and 10~~
Bits
8 7 6 5 4 3 2 1
In MS to network direction:
0 0 0 0 0 0 0 0~~All bits 1~~ Subscribed maximum bit rate for uplink
In network to MS direction:
0 0 0 0 0 0 0 0~~All bits 1~~ Reserved
In MS to network direction and in network to MS direction :
0 0 0 0 0 0 0 1 – The maximum bit rate is binary coded in 8 bits, using a granularity of 1 kbps
0 0 1 1 1 1 1 1 giving a range of values from 1 kbps to 63 kbps in 1 kbps increments.

0 1 0 0 0 0 0 0 – The maximum bit rate is 64 kbps + ((the binary coded value in 8 bits –01000000) * 8 kbps)
0 1 1 1 1 1 1 1 giving a range of values from 64 kbps to 564 kbps in 8 kbps increments.

1 0 0 0 0 0 0 0 - The maximum bit rate is 576 kbps + ((the binary coded value in 8 bits –10000000) * 64 kbps)
1 1 1 1 1 1 1 0 giving a range of values from 576 kbps to 8640 kbps in 64 kbps increments.

1 1 1 1 1 1 1 1 Reserved
~~The Maximum bit rate for uplink value consists of 16 bits. Maximum value is 2000 kbps. The granularity is 4 kbps.~~

Maximum bit rate for downlink, octet ~~11~~9 ~~and 12~~ (see TS 23.107)
~~In MS to network direction:~~
~~All bits 1 Subscribed maximum bit rate for downlink~~
~~In network to MS direction:~~
~~All bits 1 ReservedIn MS to network direction and in network to MS direction :~~
~~The Maximum bit rate for downlink value consists of 16 bits. Maximum value is 2000 kbps. The granularity is 4 kbps.~~
Coding is identical to that of Maximum bit rate for uplink.

Residual Bit Error Rate (BER), octet 1~~0~~3 (see TS 23.107)
Bits
8 7 6 5 ~~4 3 2 1~~
In MS to network direction:
0 0 0 0 ~~0 0 0 0~~ Subscribed residual BER
In network to MS direction:
0 0 0 0 ~~0 0 0 0~~ Reserved
In MS to network direction and in network to MS direction :
The Residual BER value consists of ~~8~~ 4 bits. The ranges from $5*10^{-2}$ to $6*10^{-8}$. ~~4 bits is assigned to multiplicand and exponent, respectively.~~
~~0 1 0 1 0 0 1 0~~ 0 0 0 1 $5*10^{-2}$
~~0 0 0 1 0 0 1 0~~ 0 0 1 0 $1*10^{-2}$
0 0 1 1 $5*10^{-3}$
~~0 1 0 0 0 0 1 1~~ 0 1 0 0 $4*10^{-3}$
~~0 0 0 1 0 0 1 1~~ 0 1 0 1 $1*10^{-3}$
~~0 0 0 1 0 1 0 0~~ 0 1 1 0 $1*10^{-4}$
~~0 0 0 1 0 1 0 1~~ 0 1 1 1 $1*10^{-5}$
~~0 0 0 1 0 1 1 0~~ 1 0 0 0 $1*10^{-6}$
~~0 1 1 0 1 0 0 0~~ 1 0 0 1 $6*10^{-8}$
1111 Reserved

The network shall map all other values not explicitly defined onto one of the values defined in this version of the protocol. The network shall return a negotiated value which is explicitly defined in this version of the protocol.

The MS shall consider all other values as reserved.
~~All other values are reserved.~~

SDU error ratio, octet 10 ~~4~~ (see TS 23.107)
Bits
~~8 7 6 5~~ 4 3 2 1
In MS to network direction:
~~0 0 0 0~~ 0 0 0 0 Subscribed SDU error ratio
In network to MS direction:
~~0 0 0 0~~ 0 0 0 0 Reserved
In MS to network direction and in network to MS direction :
The SDU error ratio value consists of ~~8~~ 4 bits. The ranges from $1*10^{-2}$ to $1*10^{-6}$. ~~4 bits is assigned to multiplicand and exponent, respectively.~~

~~0 0 0 1 0 0 1 0~~ 0 0 0 1	$1*10^{-2}$
0 0 1 0	$7*10^{-3}$
~~0 0 0 1~~ 0 0 1 1	$1*10^{-3}$
~~0 0 0 1~~ 0 1 0 0	$1*10^{-4}$
~~0 0 0 1~~ 0 1 0 1	$1*10^{-5}$
~~0 0 0 1~~ 0 1 1 0	$1*10^{-6}$
1 1 1 1	Reserved

~~All other values are reserved.~~ The network shall map all other values not explicitly defined onto one of the values defined in this version of the protocol. The network shall return a negotiated value which is explicitly defined in this version of the protocol.

The MS shall consider all other values as reserved.

Traffic handling priority, octet 11 (see TS 23.107)
Bits
2 1
In MS to network direction:
0 0 Subscribed traffic handling priority
In network to MS direction:
0 0 Reserved
In MS to network direction and in network to MS direction :
0 1 Priority level 1
1 0 Priority level 2
1 1 Priority level 3

The Traffic handling priority value is ignored if the Traffic Class is Conversation class, Streaming class or Background class.

Transfer delay, octet 11~~5~~ (See TS 23.107)
Bits
8 7 6 5 4 3
In MS to network direction:
0 0 0 0 0 0~~All bits 1~~ Subscribed transfer delay
In network to MS direction:
0 0 0 0 0 0~~All bits 1~~ Reserved
In MS to network direction and in network to MS direction :
0 0 0 0 0 1 – The Transfer delay is binary coded in 6 bits, using a granularity of 10 ms
0 0 1 1 1 1 giving a range of values from 10 ms to 150 ms in 10 ms increments

0 1 0 0 0 0 – The transfer delay is 200 ms + ((the binary coded value in 6 bits – 010000) * 50 ms)
0 1 1 1 1 1 giving a range of values from 200 ms to 950 ms in 50ms increments

1 0 0 0 0 0 – The transfer delay is 1000 ms + ((the binary coded value in 6 bits – 100000) * 100 ms)
1 1 1 1 1 0 giving a range of values from 1000 ms to 4100 ms in 100ms increments

1 1 1 1 1 1 Reserved

~~The Transfer delay value consists of 8 bits. Maximum value is 2560ms. The granularity is 10 ms.~~

The Transfer delay value is ignored if the Traffic Class is Interactive class or Background class.

Guaranteed bit rate for uplink, octet 16 and 17 (See TS 23.107)
~~In MS to network direction:~~
~~All bits 1 Subscribed guaranteed bit rate for uplink~~
~~In network to MS direction:~~
~~All bits 1 Reserved~~
~~In MS to network direction and in network to MS direction :~~

~~The Guaranteed bit rate for uplink value consists of 16 bits. Maximum value is 2000 kbps. The granularity is 4 kbps.~~
Coding is identical to that of Maximum bit rate for uplink.
The Guaranteed bit rate for uplink value is ignored if the Traffic Class is Interactive class or Background class.

Guaranteed bit rate for downlink, octet 13~~8 and 19~~ (See TS 23.107)
~~In MS to network direction:~~
~~All bits 1 Subscribed guaranteed bit rate for downlink~~
~~In network to MS direction:~~
~~All bits 1 Reserved~~
~~In MS to network direction and in network to MS direction :~~
~~The Guaranteed bit rate for downlink value consists of 16 bits. Maximum value is 2000 kbps. The granularity is 4 kbps.~~
Coding is identical to that of Maximum bit rate for uplink.
The Guaranteed bit rate for downlink value is ignored if the Traffic Class is Interactive class or Background class.

~~Traffic handling priority, octet 20 (see TS 23.107)~~
~~Bits~~
~~2 1~~
~~In MS to network direction:~~
~~0 0 Subscribed traffic handling priority~~
~~In network to MS direction:~~
~~0 0 Reserved~~
~~In MS to network direction and in network to MS direction :~~
~~0 1 Priority level 1~~
~~1 0 Priority level 2~~
~~1 1 Priority level 3~~

~~All other values are reserved.~~

~~The Traffic handling priority value is ignored if the Trafic Class is Conversation class, Streaming class or Background class.~~

3GPP/SMG Meeting #11
Umea, Sweden, 28 February - 03 March.2000

Document N1-000508
Rev of N1-000378
e.g. for 3GPP use the format TP-99xxx or for SMG, use the format P-99-xxx

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

24.008	CR	162 r1	Current Version:	3.2.1

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: TSGN#7 *list expected approval meeting # here ↑*	for approval	X	strategic		*(for SMG use only)*
	for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)*	(U)SIM		ME	X	UTRAN / Radio		Core Network	X

Source: CN1 **Date:** 29.02.2000

Subject: Deletion/modification of primary PDP context

Work item: Enhanced QoS support in GPRS

Category: *(only one category shall be marked with an X)*				**Release:**	
	F	Correction	X	Phase 2	
	A	Corresponds to a correction in an earlier release		Release 96	
	B	Addition of feature		Release 97	
	C	Functional modification of feature		Release 98	
	D	Editorial modification		Release 99	X
				Release 00	

Reason for change: According to SA2 the terms primary and secondary context should not have different behaviour or preferably not used. This CR corrects the terminology according to 23.060. Note that references to the 'secondary PDP context activation procedure' are legitimate as they relate to the procedure started by sending a Secondary PDP Context Activation Request.

Clauses affected: 6.1.2.1.5, 6.1.2.2.5, 6.1.3.1, 6.1.3.2, 6.1.3.2.1, 6.1.3.2.2, 6.1.3.2.3, 6.1.3.3, 6.1.3.4, 6.1.3.4.1, 9.5.4, 9.5.5, 9.5.6, 9.5.10.3 and Annex I.1

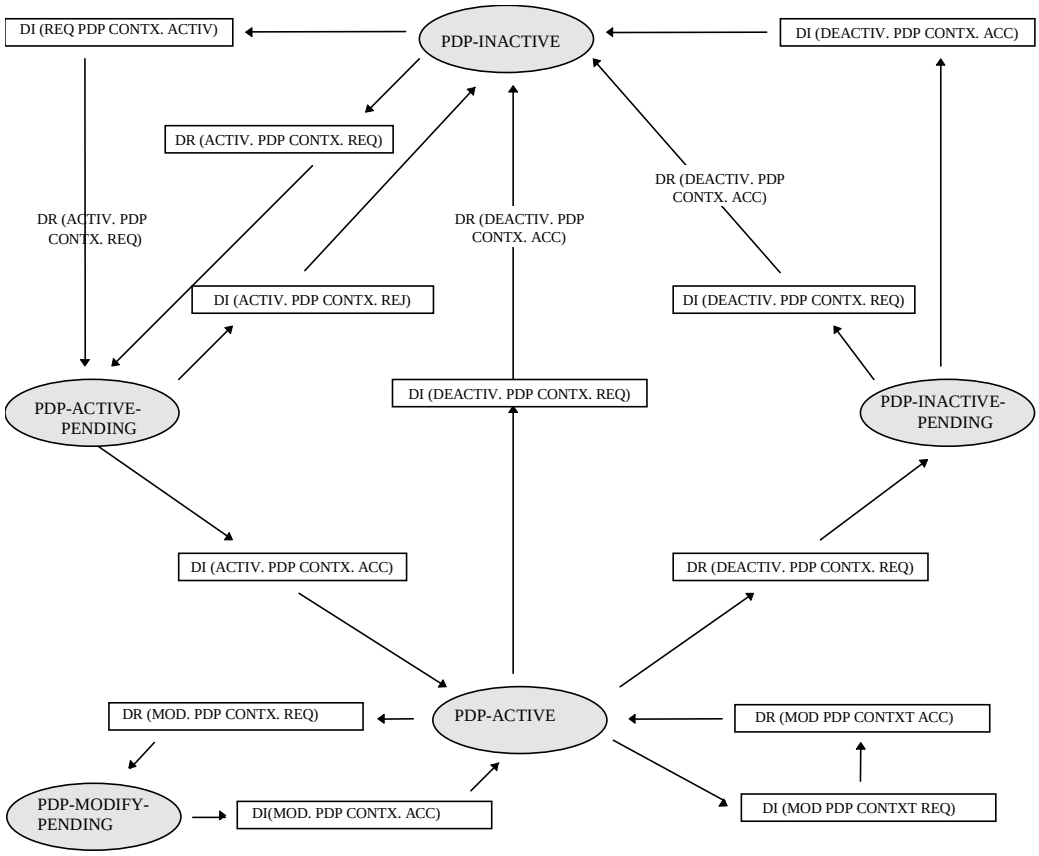
Other specs affected:			
Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

<--------- double-click here for help and instructions on how to create a CR.

6.1.2.1.5 PDP-MODIFY_PENDING

This state exists when modification of the PDP context was requested by the MS.



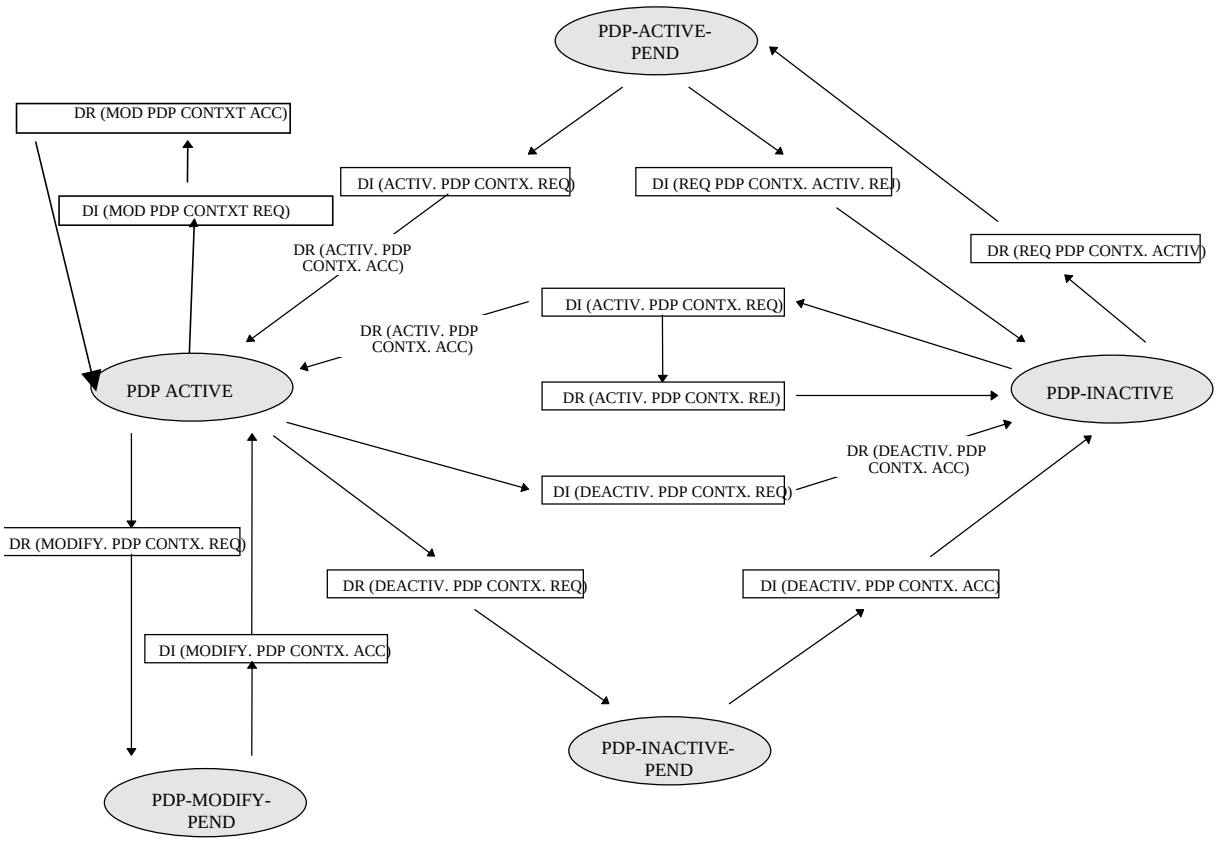
DR: GMMSM-DATA-REQUEST (Message), i.e. message sent by an MS
DI: GMMSM-DATA-INDICATION (Message), i.e. message received by an MS

Figure 6.1/TS 24.008: Session management states in the MS (overview)

It shall be noted, that Figure 6.1/TS 24.008 applies to both the PDP context activation procedure ~~primary~~ and the secondary PDP context~~s~~ activation procedure, though the distinction in messages regarding the activation of ~~primary and secondary~~ PDP contexts is not shown here for simplicity.

6.1.2.2.5 PDP-MODIFY-PENDING

This state exists when modification of the PDP context was requested by the network.



DR: GMMSM-DATA-REQUEST (Message), i.e. message sent by network
DI: GMMSM-DATA-INDICATION (Message), i.e. message received by the network

Figure 6.2/TS 24.008: Session management states on the network side (overview)

It shall be noted, that Figure 6.2/TS 24.008 applies to both the PDP context activation procedure ~~primary~~ and the secondary PDP context~~s~~ activation procedure, though the distinction in messages regarding the activation of ~~primary and secondary~~ PDP contexts is not shown here for simplicity.

6.1.3.1 PDP context activation

The purpose of this procedure is to establish a PDP context between the MS and the network for a specific QoS on a specific NSAPI. The PDP context activation may be initiated by the MS or the initiation may be requested by the network.

Each PDP address may be described by one or more PDP contexts in the MS or the network. The PDP Context Activation procedure is used to activate ~~T~~the first PDP context ~~activated~~ for a given PDP address and APN~~is called the primary context~~, whereas all additional contexts associated to the same PDP address and APN are ~~called~~ activated with the secondary PDP context~~s~~ activation procedure. When more than one PDP contexts are associated to a PDP address, there shall be a Traffic Flow Template (TFT) for each or all but one~~additional~~ context. The TFT shall be sent transparently via the SGSN to the GGSN to enable packet classification and policing for downlink data transfer (see TS 23.060).

6.1.3.2 Secondary PDP Context Activation Procedure

The purpose of this procedure is to establish an ~~secondary~~ additional PDP context between the MS and the network for a specific Traffic Flow Template (TFT) and QoS profile on a specific NSAPI, when one or more PDP contexts has/have already been established for the particular PDP address. For each ~~secondary~~ of these PDP contexts, a different QoS profile and TFT shall be requested.

6.1.3.2.1 Successful Secondary PDP Context Activation Procedure Initiated by the MS

In order to request a ~~secondary~~ PDP context activation with the same PDP address and APN as an already active PDP context, the MS shall send an ACTIVATE SECONDARY PDP CONTEXT REQUEST message to the network, enter the state PDP-ACTIVE-PENDING and start timer T3380. The message shall contain the selected NSAPI. The MS shall ensure that the selected NSAPI is not currently being used by another Session Management entity in the MS. The message shall also include a QoS profile, a TFT, a requested LLC SAPI and the Linked TI. The QoS profile is the requested QoS. The TFT shall be sent transparently through the SGSN to the GGSN to enable packet classification and policing for downlink data transfer.

Upon receipt of an ACTIVATE SECONDARY PDP CONTEXT REQUEST, the network shall validate the message by verifying the TI given in the Linked TI IE to be any of the active PDP context(s). The same GGSN address shall be used by the SGSN as for the already established PDP context(s) for that PDP address. The network shall select a radio priority level based on the QoS negotiated and shall reply with an ACTIVATE SECONDARY PDP CONTEXT ACCEPT message, if the request can be accepted.

Upon receipt of the message ACTIVATE SECONDARY PDP CONTEXT ACCEPT, the MS shall stop timer T3380 and enter the state PDP-ACTIVE. If the offered QoS parameters received from the network differ from the QoS requested by the MS, the MS shall either accept the negotiated QoS or initiate the PDP context deactivation procedure.

In GSM the MS shall initiate establishment of the logical link for the LLC SAPI indicated by the network with the offered QoS and selected radio priority level if no logical link has been already established for that SAPI. If the LLC SAPI indicated by the network can not be supported by the MS, the MS shall initiate the PDP context deactivation procedure.

In UMTS, both SGSN and MS shall store the LLC SAPI and the radio priority in the PDP context. If a UMTS to GSM Routing Area Update is performed, the new SGSN shall initiate establishment of the logical link using the negotiated LLC SAPI, the negotiated QoS profile and selected radio priority level stored in the PDP context as in a GSM to GSM Routing Area Update.

An MS, which is capable of operating in both GSM and UMTS, shall use a valid LLC SAPI, while an MS which is capable of operating only in UMTS shall indicate the LLC SAPI value as "LLC SAPI not assigned" in order to avoid unnecessary value range checking and any other possible confusion in the network.

NOTE: The radio priority level and the LLC SAPI parameters, though not used in UMTS, shall be included in the messages, in order to support handover between UMTS and GSM networks.

6.1.3.2.2 Unsuccessful Secondary PDP Context Activation Procedure initiated by the MS

Upon receipt of an ACTIVATE SECONDARY PDP CONTEXT REQUEST message, the network may reject the MS initiated ~~secondary~~ PDP context activation by sending an ACTIVATE SECONDARY PDP CONTEXT REJECT message to the MS. The message shall contain a cause code that typically indicates one of the following:

26: insufficient resources;
30: activation rejected by GGSN;
31: activation rejected, unspecified;
32: service option not supported;
33: requested service option not subscribed;
34: service option temporarily out of order;
35: NSAPI already used;
41: TFT already used;
42: invalid TFT;
43: unknown PDP context;
95 - 111: protocol errors.

Upon receipt of an ACTIVATE SECONDARY PDP CONTEXT REJECT message, the MS shall stop timer T3380 and enter the state PDP-INACTIVE.

6.1.3.2.3 Abnormal cases

The following abnormal cases can be identified:

a) Expiry of timers

On the first expiry of the timer T3380, the MS shall resent the ACTIVATE SECONDARY PDP CONTEXT REQUEST and shall reset and restart timer T3380. This retransmission is repeated four times, i.e. on the fifth expiry of timer T3380, the MS shall release all resources possibly allocated for this invocation and shall abort the procedure; no automatic PDP context activation re-attempt shall be performed.

b) MS initiated ~~S~~secondary PDP context activation procedure for an already activated ~~Secondary~~ PDP context (On the network side)

If all parameters of the new ACTIVATE SECONDARY PDP CONTEXT REQUEST message match with those of a previously activated PDP context, the network shall reply with an ACTIVATE SECONDARY PDP CONTEXT ACCEPT message.

Otherwise, the network shall check the parameters as follows:

The SGSN shall first check whether there is an activated PDP context for the TI given in the Linked TI IE in the ACTIVATE SECONDARY PDP CONTEXT REQUEST message. If there is no active PDP context for the specified TI, the network shall reply with an ACTIVATE SECONDARY PDP CONTEXT REJECT message, cause code indicating "unknown PDP context". If there exists a PDP context for the given TI, then the requested NSAPI is checked. If there exists an active PDP context with the same NSAPI, the network shall reject the activation with cause "NSAPI already used". Otherwise, the TFT in the request message is checked. If the TFT is invalid, the network shall reject the activation request with cause "Invalid TFT". If the TFT is valid but it is already used by another context of the same PDP address, the network shall reject the activation request with cause "TFT already used". Otherwise, the network shall accept the activation request by replying to the MS with an ACTIVATE SECONDARY PDP CONTEXT ACCEPT message.

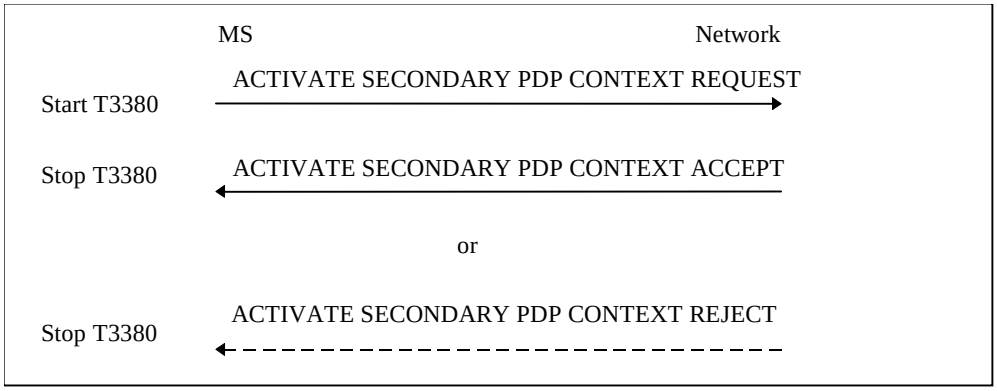


Figure 6.5/TS 24.008: MS initiated secondary PDP context activation procedure

6.1.3.3 PDP context modification procedure

The PDP context modification procedure is invoked by the network or by the MS, in order to change the QoS negotiated, the Radio priority level, or the TFT, negotiated during the PDP context activation procedure, the secondary PDP context activation procedure or at previously performed PDP context modification procedures. The MS may also create and delete a TFT in an active PDP context. The procedure can be initiated by the network or the MS at any time when a PDP context is active.

The network requested PDP context modification procedure may also be used to update the PDP address when external PDN address allocation is performed, in which case the MS receives the PDP address in the MODIFY PDP CONTEXT REQUEST (Network to MS direction) message.

NOTE: The procedure may be initiated by the network due to an inter-SGSN Routing Area Updating when a PDP context is active.

6.1.3.4 PDP context deactivation procedure

The purpose of this procedure is to deactivate an existing PDP context between the MS and the network. The PDP context deactivation may be initiated by the MS or by the network. ~~This procedure can also be used to deactivate secondary PDP contexts.~~ The *tear down indicator* information element may be included in the DEACTIVATE PDP CONTEXT REQUEST message in order to indicate whether only the PDP context associated with this specific TI or all active PDP contexts sharing the same PDP address as the PDP context associated with this specific TI shall be deactivated. If the *tear down indicator* information element is not included in the DEACTIVATE PDP CONTEXT REQUEST message, only the PDP context associated with this specific TI shall be deactivated.

6.1.3.4.1 PDP context deactivation initiated by the MS

In order to deactivate a PDP context, the MS sends a DEACTIVATE PDP CONTEXT REQUEST message to the network, enters the state PDP-INACTIVE-PENDING and starts timer T3390. The message contains the transaction identifier (TI) in use for the PDP context ~~or secondary PDP context~~ to be deactivated and a cause code that typically indicates one of the following causes:

25: LLC or SNDCP failure(GSM only) ;
26: insufficient resources;
36: regular PDP context deactivation; or
37: QoS not accepted.

The network shall reply with the DEACTIVATE PDP CONTEXT ACCEPT message. Upon receipt of the DEACTIVATE PDP CONTEXT ACCEPT message, the MS shall stop timer T3390. In GSM, both the MS and the network shall initiate local release of the logical link if it is not used by another PDP context. In UMTS, the network shall initiate the release of Radio Access Bearer associated with this PDP context.

9.5.4 Activate Secondary PDP Context Request

This message is sent by the MS to the network to request activation of an ~~secondary~~ additional PDP context associated with the same PDP address and APN as an already active PDP context. See Table 9.5.4/TS 24.008.

Message type: ACTIVATE SECONDARY PDP CONTEXT REQUEST

Significance: global

Direction: MS to network

Table 9.5.4/TS 24.008: Activate SECONDARY PDP context request message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	½
	Transaction identifier	Transaction identifier 10.3.2	M	V	½
	Activate secondary PDP context request message identity	Message type 10.4	M	V	1
	Requested NSAPI	Network service access point identifier 10.5.6.2	M	V	1
	Requested LLC SAPI	LLC service access point identifier 10.5.6.9	M	V	1
	Requested QoS	Quality of service 10.5.6.5	M	LV	FFS
	TFT	Traffic Flow Template	M	LV	FFS
	Linked TI	Linked TI 10.5.6.7	M	LV	2-3

9.5.5 Activate Secondary PDP Context Accept

This message is sent by the network to the MS to acknowledge activation of an ~~secondary~~ additional PDP context associated with the same PDP address and APN as an already active PDP context. See Table 9.5.5/TS 24.008.

Message type: ACTIVATE SECONDARY PDP CONTEXT ACCEPT

Significance: global

Direction: network to MS

Table 9.5.5/TS 24.008: ACTIVATE SECONDARY PDP CONTEXT ACCEPT message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2
	Activate secondary PDP context accept message identity	Message type 10.4	M	V	1
	Negotiated LLC SAPI	LLC service access point identifier 10.5.6.9	M	V	1
	Negotiated QoS	Quality of service 10.5.6.5	M	LV	FFS
	Radio priority	Radio priority	M	V	1/2
	Spare half octet	Spare half octet 10.5.1.8	M	V	1/2
34	Packet Flow Identifier	Packet Flow Identifier 10.5.6.11	O	TLV	3

9.5.5.1 Packet Flow Identifier

This IE may be included if the network wants to indicate the Packet Flow Identifier associated to the PDP context.

9.5.6 Activate Secondary PDP Context Reject

This message is sent by the network to the UE to reject activation of an ~~secondary~~ additional PDP context associated with the same PDP address and APN as an already active PDP context. See Table 9.5.6/TS 24.008.

Message type: ACTIVATE SECONDARY PDP CONTEXT REJECT

Significance: global

Direction: network to MS

Table 9.5.6/TS 24.008: ACTIVATE SECONDARY PDP CONTEXT REJECT message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2
	Activate secondary PDP context reject message identity	Message type 10.4	M	V	1
	SM cause	SM Cause 10.5.6.6	M	V	1

9.5.10 Modify PDP context request (MS to network direction)

This message is sent by the MS to the network to request modification of an active PDP context. See table 9.5.10/TS 24.008.

Message type: MODIFY PDP CONTEXT REQUEST (MS TO NETWORK DIRECTION)

Significance: global

Direction: MS to network

Table 9.5.10/TS 24.008: modify PDP context request (MS to network direction) message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2
	Modify PDP context request message identity	Message type 10.4	M	V	1
32	Requested LLC SAPI	LLC service access point identifier 10.5.6.9	O	TV	2
30	Requested new QoS	Quality of service 10.5.6.5	O	TLV	FFS
31	New TFT	Traffic Flow Template	O	TLV	FFS

9.5.10.1 Requested LLC SAPI

This IE may be included in the message to request a new LLC SAPI if a new QoS is requested.

9.5.10.2 Requested new QoS

This IE may be included in the message to request a modification of the QoS.

9.5.10.3 New TFT

This IE is included in the message only when ~~the modification applies to a secondary~~multiple PDP contexts with the same PDP address and APN are active ~~(FFS)~~, to request modification of the TFT.

Annex I (informative): GPRS specific cause values for session management

This annex is informative.

I.1 Causes related to nature of request

Cause value = 25 LLC or SNDCP failure (GSM only)

This cause code is used by the MS indicate that a PDP context is deactivated because of a LLC or SNDCP failure (e.g. if the SM receives a *SNSM-STATUS.request* message with cause "*DM received* " or " *invalid XID response* ", see GSM 04.65 [78])

Cause value = 26 Insufficient resources

This cause code is used by the MS or by the network to indicate that a PDP context activation request, ~~S~~secondary PDP context activation request or PDP context modification request cannot be accepted due to insufficient resources.

Cause value = 27 Unknown or missing access point name

This cause code is used by the network to indicate that the requested service was rejected by the external packet data network because the access point name was not included although required or if the access point name could not be resolved.

Cause value = 28 Unknown PDP address or PDP type

This cause code is used by the network to indicate that the requested service was rejected by the external packet data network because the PDP address or type could not be recognised.

Cause value = 29 User authentication failed

This cause code is used by the network to indicate that the requested service was rejected by the external packet data network due to a failed user authentication.

Cause value = 30 Activation rejected by GGSN

This cause code is used by the network to indicate that the requested service was rejected by the GGSN.

Cause value = 31 Activation rejected, unspecified

This cause code is used by the network to indicate that the requested service was rejected due to unspecified reasons.

Cause value = 32 Service option not supported

This cause code is used by the network when the MS requests a service which is not supported by the PLMN.

Cause value = 33 Requested service option not subscribed

See Annex G, section 4.

Cause value = 34 Service option temporarily out of order

See Annex G, section 4.

Cause value = 35 NSAPI already used

This cause code is used by the network to indicate that the NSAPI requested by the MS in the PDP context activation or ~~S~~secondary PDP context activation request is already used by another active PDP context of this MS.

Cause value = 36 Regular PDP context deactivation

This cause code is used to indicate a regular MS or network initiated PDP context deactivation.

Cause value = 37 QoS not accepted

This cause code is used by the MS if the new QoS cannot be accepted that were indicated by the network in the PDP Context Modification procedure.

Cause value = 38 Network failure

This cause code is used by the network to indicate that the PDP context deactivation is caused by an error situation in the network.

Cause value = 39 Reactivation requested

This cause code is used by the network to request a PDP context reactivation after a GGSN restart.

Cause value = 40 Feature not supported

This cause code is used by the MS to indicate that the PDP context activation initiated by the network is not supported by the MS.

Cause value = 41 TFT already used

This cause code is used by the network to indicate that the TFT indicated in the secondary PDP context activation request is already used.

Cause value = 42 invalid TFT

This cause code is used by the network to indicate that the TFT indicated in the secondary PDP context activation request is invalid.

Cause value = 43 unknown PDP context

This cause code is used by the network to indicate that the ~~primary~~ PDP context ~~specified~~ identified ~~in~~by the Linked TI IE in the secondary PDP context activation request is not active.