3GPP TSG CN Plenary Meeting #22 **NP-030485**
10th - 12th December 2003. Hawaii, USA.

Source: **TSG CN WG 1**

Title: **CRs to Rel-6 on Work Item TEI6 towards 24.007 and 24.008**

Agenda item: **9.22**

Document for: **APPROVAL**

Introduction:

This document contains **8** CRs, **Rel-6** Work Item **"TEI6"**, that have been agreed by **TSG CN WG1 in CN1#32 meeting**, and are forwarded to TSG CN Plenary meeting #22 for approval.

TDoc #	Tdoc Title	Spec	CR #	Rev	CAT	C_Version	Rel
N1-031653	Don't use SAPI to differentiate between messages of the same message type.	24.007	059	1	F	5.1.0	Rel-6
N1-031651	TFT error handling	24.008	803	2	F	6.2.0	Rel-6
N1-031390	ePLMN list extension	24.008	816		C	6.2.0	Rel-6
N1-031649	SM signalling in case tear down is requested	24.008	818	1	F	6.2.0	Rel-6
N1-031505	Order of frequency bands in MS Radio Access Capability IE	24.008	820		F	6.2.0	Rel-6
N1-031516	Correction of timer handling in diagram 4.7.7a	24.008	823		D	6.2.0	Rel-6
N1-031525	Removal of codepoint for GTP ack mode	24.008	826		F	6.2.0	Rel-6
N1-031529	SSD and Signalling indication in QoS IE	24.008	827		F	6.2.0	Rel-6

3GPP TSG-CN1 Meeting #32 **Tdoc N1-031653**
Bangkok, Thailand, 27 – 31 October 2003 **(Revision of N1-031598)**

CR-Form-v7

CHANGE REQUEST

⌘ **24.007** **CR** 059 ⌘ **rev** **1** ⌘ Current version: **5.1.0** ⌘

*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 [X] Radio Access Network [X] Core Network [X]

Title:	⌘	Don't use SAPI to differentiate between messages of the same message type.
Source:	⌘	Vodafone Ltd
Work item code:	⌘	TEI6
Date:	⌘	21/10/2003
Category:	⌘	**F**
Release:	⌘	Rel-6

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	Recent changes for SMS have revealed that the core network cannot rely on the UTRAN to separate messages according to the Layer 2 SAPI. This is especially true in the Uplink. However, since GSM release ['95], 04.07/24.007 has indicated that this separation can be used by the CN.
Summary of change:	⌘	As up to now there is no protocol for which the same message type within one direction is assigned twice for different content depending on which transport "bearer" the message is transmitted, this unused capability is removed from 24.007.
Consequences if not approved:	⌘	Perhaps R'99 UTRAN ought to be updated to align with the original core specifications, and such an update to a frozen release would be bad.

Clauses affected:	⌘	11.2.3.2.1, 11.2.3.2.2

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

Other comments:	⌘	

How to create CRs using this form:
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.

11.2.3.2 Message type octet

11.2.3.2.1 Message type octet (when accessing Release 98 and older networks only)

The message type octet is the second octet in a standard L3 message.

When a standard L3 message is expected, and a message is received that is less than 16 bit long, that message shall be ignored.

When the radio connection started with a core network node of a Release 98 or older network, the message type IE is coded as shown in figure 11.10a and 11.10x.

Bit 8 is encoded as "0"; value "1" is reserved for possible future use as an extension bit. A protocol entity expecting a standard L3 message, and receiving a message containing bit 8 of octet 2 encoded as "1" shall diagnose a " message not defined for the PD" error and treat the message accordingly.

In messages of MM, CC, SS, GCC, BCC and LCS protocol sent using the transmission functionality provided by the RR layer to upper layers, and sent from the mobile station or the LMU to the network, bit 7 of octet 2 is used for send sequence number, see clause 11.2.3.2.3.

In all other standard layer 3 messages, except for RR messages, bit 7 is set to a default value. A protocol entity expecting a standard L3 message, and not using the transmission functionality provided by the RR layer, and receiving a message containing bit 7 of octet 2 encoded different to the default value shall diagnose a "message not defined for the PD" error and treat the message accordingly.

The default value for bit 7 is 0 except for the SM protocol where the default value is 1. No default value for bit 7 is specified for RR protocol. For RR message types see 3GPP TS 44.018.

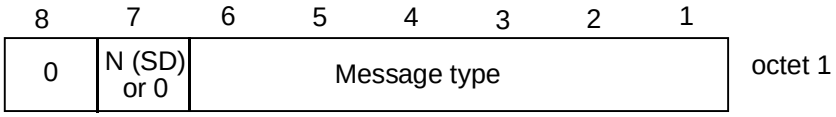

Figure 11.10a: Message type IE (MM, CC, SS, GCC, BCC and LCS)

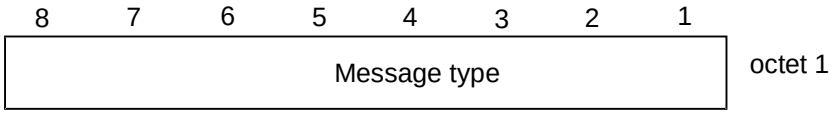

Figure 11.10x: Message type IE (protocol other than MM, CC, SS, GCC, BCC and LCS)

For MM, CC, SS, GCC, BCC and LCS protocols bits 1 to 6 of octet 2 of standard L3 messages contain the message type. For all other L3 protocols bits 1 to 8 of octet 2 of standard L3 message contain the message type.

The message type determines the function of a message within a protocol in a given direction ~~and for a given lower layer SAP~~. The meaning of the message type is therefore dependent on the protocol (the same value may have different meanings in different protocols), and the direction (the same value may have different meanings in the same protocol, when sent from the Mobile Station to the network and when sent from the network to the Mobile Station) ~~and the lower layer SAP (the same value may have different meanings, e.g., whether the message was sent on the SACCH or on the main DCCH)~~.

Each protocol defines a list of allowed message types for each relevant SAP. A message received analysed as a standard L3 message, and with a message type not in the corresponding list leads to the diagnosis "message not defined for the PD". Some message types may correspond to a function not implemented by the receiver. They are then said to be non implemented by the receiver.

The reaction of a protocol entity expecting a standard L3 message and receiving a message with message type not defined for the PD or not implemented by the receiver and the reception conditions is defined in the relevant protocol specification. As a general rule, a protocol specification should not force the receiver to analyse the message further.

11.2.3.2.2 Message type octet (when accessing Release 99 and newer networks)

The message type octet is the second octet in a standard L3 message.

When a standard L3 message is expected, and a message is received that is less than 16 bit long, that message shall be ignored.

When the radio connection started with a core network node of a Release 99 or later network, the message type IE is coded dependent on the PD as shown in figures 11.10b, c and d.

In messages of MM, CC and SS protocol sent using the transmission functionality provided by the RR and/or access stratum layer to upper layers, and sent from the mobile station or the LMU to the network, bits 7 and 8 of octet 2 are used for send sequence number, see clause 11.2.3.2.3.

In messages of GCC, BCC and LCS protocol sent using the transmission functionality provided by the RR layer to upper layers, and sent from the mobile station to the network or, for LCS, sent from the LMU to the network, only bit 7 of octet 2 is used for send sequence number. Bit 8 is set to the default value.

In all other standard layer 3 messages, except for RR messages, bits 7 and 8 are set to the default value. A protocol entity expecting a standard L3 message, and not using the transmission functionality provided by the RR and/or access stratum layer, and receiving a message containing bit 7 or bit 8 of octet 2 encoded different to the default value shall diagnose a "message not defined for the PD" error and treat the message accordingly.

In messages of the RR protocol entity, bit 8 of octet 2 is set to the default value. The other value is reserved for possible future use as an extension bit .If an RR protocol entity expecting a standard L3 message receives message containing bit 8 of octet 2 encoded different from the default value it shall diagnose a "message not defined for the PD" error and treat the message accordingly.

The default value for bit 8 is 0. The default value for bit 7 is 0 except for the SM protocol which has a default value of 1. No default value for bit 7 is specified for RR protocol. For RR message types see 3GPP TS 44.018.

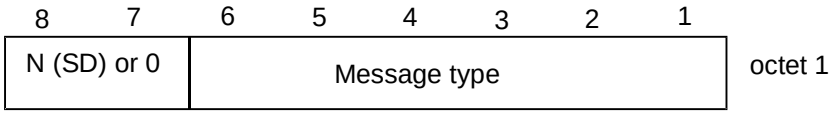

Figure 11.10b: Message type IE (MM, CC and SS)

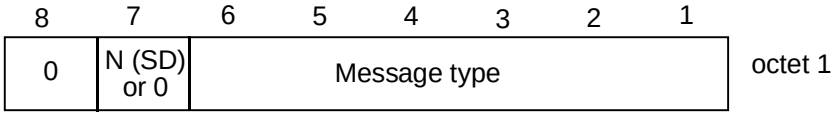

Figure 11.10c: Message type IE (GCC, BCC and LCS)

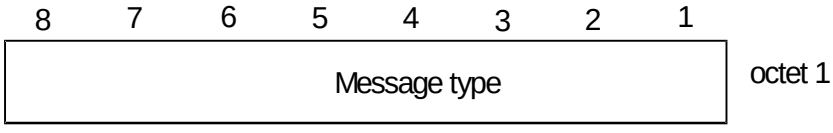

Figure 11.10d: Message type IE (protocol other than MM, CC, SS, GCC, BCC and LCS)

For MM, CC, SS, GCC, BCC and LCS protocols bits 1 to 6 of octet 2 of standard L3 messages contain the message type. For all other L3 protocols bits 1 to 8 of octet 2 of standard L3 message contain the message type.

The message type determines the function of a message within a protocol in a given direction ~~and for a given lower layer SAP~~. The meaning of the message type is therefore dependent on the protocol (the same value may have different meanings in different protocols), and the direction (the same value may have different meanings in the same protocol, when sent from the Mobile Station to the network and when sent from the network to the Mobile Station) ~~and the lower layer SAP (the same value may have different meanings, e.g., whether the message was sent on the SACCH or on the main DCCH)~~.

Each protocol defines a list of allowed message types for each relevant SAP. A message received analysed as a standard L3 message, and with a message type not in the corresponding list leads to the diagnosis "message not defined for the PD". Some message types may correspond to a function not implemented by the receiver. They are then said to be non implemented by the receiver.

The reaction of a protocol entity expecting a standard L3 message and receiving a message with message type not defined for the PD or not implemented by the receiver and the reception conditions is defined in the relevant protocol specification. As a general rule, a protocol specification should not force the receiver to analyse the message further.

11.2.3.2.3 Sequenced message transfer operation

Upper layer messages sent using the RR sub-layer transport service from the mobile station to the network can be duplicated by the data link layer in at least the following cases:

- in A/Gb mode, when a channel change of dedicated channels is required (assignment or handover procedure) and the last layer 2 frame has not been acknowledged by the peer data link layer before the mobile station leaves the old channel;
- in Iu mode, when an RLC re-establishment occurs (e.g. due to relocation) and the RLC layer has not acknowledged the last one or more RLC PDUs before RLC re-establishment;
- an inter-system change from Iu mode to A/Gb mode is performed and the RLC layer has not acknowledged the last one or more RLC PDUs;
- an inter-system change from A/Gb mode to Iu mode is performed and the the last layer 2 frame in A/Gb mode has not been acknowledged by the peer data link layer before the mobile station leaves the old channel.

In these cases, the mobile station does not know whether the network has received the messages correctly. Therefore, the mobile station has to send the messages again when the channel change is completed.

The network must be able to detect the duplicated received messages. Therefore, each concerned upper layer messages must be marked with a send sequence number.

To allow for different termination points in the infrastructure of the messages of different PDs, the sequence numbering is specific to each PD. For historical reasons, an exception is that messages sent with the CC, SS and MM PDs share the same sequence numbering. In the following, the phrase **upper layer message flow** refers to a flow of messages sharing the same sequence numbering. The different upper layer flows are MM+CC+SS, GCC, BCC and LCS. The GMM, SM, SMS and TC (Test Control, see 3GPP TS 44.014 [5a] and 3GPP TS 34.109 [17a]) protocols do not use layer 3 sequence numbering.

11.2.3.2.3.1 Variables and sequence numbers

11.2.3.2.3.1.1 Send state variable V(SD)

The mobile station shall have one associated send state variable V(SD) ("Send Duplicated") for each upper layer message flow. The send state variable denotes the sequence number of the next in sequence numbered message in the flow to be transmitted. The value of the corresponding send state variable shall be incremented by one with each numbered message transmission.

For the MM+CC+SS upper layer message flow, when the RR connection starts with a core network of release 98 or earlier, arithmetic operations on V(SD) are performed modulo 2. When the RR connection starts with a core network of Release 99 or later, arithmetic operations on V(SD) are performed modulo 4. The mobile station shall keep using the same modulo (2 or 4) for the duration of the RR connection.

For the GCC, BCC, and LCS upper layer message flows, arithmetic operations on V(SD) are performed modulo 2.

NOTE: In GSM, the release supported by the core network is indicated in the MSCR bit and in the SGSNR bit in the system information broadcast (see 3GPP TS 44.018 [6b] and 3GPP TS 44.060 [10a]).

11.2.3.2.3.1.2 Send sequence number N(SD)

At the time when such a message to be numbered is designated for transmission, the value of N(SD) for the message to be transferred is set equal to the value of the send state variable V(SD).

11.2.3.2.3.2 Procedures for the initiation, transfer execution and termination of the sequenced message transfer operation

11.2.3.2.3.2.1 Initiation

The sequenced message transfer operation is initiated by establishing a RR connection. The send state variables V(SD) are set to 0.

11.2.3.2.3.2.2 Transfer Execution

The core network must compare the send sequence numbers of pairs of subsequent messages in the same upper layer messages flow.

For the GCC, BCC, and LCS upper layer message flows, in case the send sequence numbers of two subsequent messages in a flow are not identical, no duplication has occurred. In case the send sequence numbers are identical, the network must ignore the second one of the received messages.

For the MM+CC+SS upper layer message flow:

- when accessed by a release 98 or earlier mobile station, in case the send sequence numbers of two subsequent messages in the flow are identical, the core network shall discard the second one of the received messages;

- when accessed by a release 99 or later mobile station, the core network shall discard any message whose N(SD) is not the increment by one (modulo 4) than the N(SD) of the last accepted message.

NOTE: The release supported by the mobile station is indicated by the revision level in *the Mobile Station Classmark 1* or *Mobile Station Classmark 2* information element, or by the revision level indicator in the *MS network capability* information element (see 3GPP TS 24.008, subclause 10.5).

11.2.3.2.3.2.3 Termination

The sequenced message transfer operation is terminated by the RR connection release procedure.

Inter system change from A/Gb mode to Iu mode or from Iu mode to A/Gb mode shall not terminate the sequenced message transfer. UMTS SRNC relocation shall not terminate the sequenced message transfer.

3GPP TSG-CN1 Meeting #32
Bangkok, Thailand, 27 – 31 October 2003

Tdoc N1-031651
(rev of Tdoc N1-031508)

CR-Form-v7

CHANGE REQUEST

⌘ **24.008** **CR** **803** ⌘ **rev** **2** ⌘ Current version: **6.2.0** ⌘

*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:	⌘	TFT error handling
Source:	⌘	Siemens AG
Work item code:	⌘	TEI-6
Date:	⌘	20.10.2003
Category:	⌘	**F**
Release:	⌘	Rel-6

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

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
Rel-4 *(Release 4)*
Rel-5 *(Release 5)*
Rel-6 *(Release 6)*

Reason for change: ⌘

The error handling for TFT operations is defined in such a way that any kind of inconsistency between the TFT configuration stored in the network and the MS will result in an error when the MS requests a creation, deletion, or change of the TFT.

Two major reasons could cause problems:
1) The first one is the re-transmission scheme defined in the SM protocol. One example would be that the MS creates a new TFT for an activated PDP context with a PDP Context Modification procedure. The network receives the PDP Context Modification message, stores the TFT configuration and answers with a PDP Modification Accept. If this PDP Modification Accept message gets lost, the SM will trigger a re-transmission of the message containing the same TFT data again. Now the network will, according to 24.008, sec. 6.1.3.3.3, bullet point “a) I”, detect a “Semantic error in TFT operations” and will answer with a PDP context Modification Reject.
The result is that the modification procedure is terminated, with different TFT configurations in the MS and in the SGSN.

2) The other reason is that the MS may deactivate PDP contexts locally, e.g. in an out of coverage situation. Here both for the Secondary PDP Context Activation procedure and the MS initiated PDP Context Modification procedure, the current TFT error handling definitions can cause the failure of the procedure.

In both cases the TFT error handling is in contradiction to the overall principle for the handling of any kind of collision and error situations in the SM protocol, where the old configuration is always superseded by the new requested one. This principle follows the assumption that the signalling link could be disturbed and thus certain message could be lost.

		The current TFT error handling, however, will make any re-synchronisation de facto impossible once an asynchrony has occurred. Especially the re-transmission case is considered to be quite critical.
Summary of change:	⌘	In order to avoid the problems described above and ensure that the SM protocol is able to cope with certain realistic error situations caused by the unreliable signalling link, the TFT error handling is aligned with the principle of the SM protocol, that the old configuration is always supersede by the new requested one. For the case of re-transmissions, a link to the TI clash in section 8 is added.
Consequences if not approved:	⌘	Whenever retransmissions occur or PDP contexts are deactivated locally by the MS, certain subsequent TFT operations will cause the failure of the procedure even if this is not needed. Even worse, the MS will not be able to detect the reason for the failure and will thus not be able to recover from this situation.

Clauses affected:	⌘	6.1.3.2.3; 6.1.3.3.3				
		Y	**N**			
Other specs affected:	⌘		**X**	Other core specifications	⌘	
			X	Test specifications		
			X	O&M Specifications		
Other comments:	⌘					

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 procedure for an already activated PDP context (On the network side)

If the NSAPI matches that of an already activated PDP context, the network shall deactivate the existing PDP context locally without notification to the MS and proceed with the requested PDP context activation. The case of a TI match is described in subclause 8.3.2. [*Format changed to B1*]

~~Otherwise, the network shall check the parameters as follows:~~

c) no PDP context with linked TI activated

The network shall then~~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". [*Format changed to B1*]

If there exists a PDP context for the TI given in the Linked TI IE, then the TFT in the request message is checked for different types of TFT IE errors as follows: [*Format changed to Normal*]

~~a)~~a) Semantic errors in TFT operations:

~~1)~~1) When the *TFT operation* is an operation other than "Create a new TFT".[*Format changed to B2*]

The network shall reject the activation request with cause "semantic error in the TFT operation".[*Format changed to B1*]

~~b)~~b) Syntactical errors in TFT operations:

1) When the *TFT operation* = "Create a new TFT" and the packet filter list in the TFT IE is empty.

2) 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".[*Format changed to B1*]

~~c)~~c) Semantic errors in packet filters:

1) 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 the present document.

The network shall reject the activation request with cause "semantic errors in packet filter(s)". [*Format changed to B1*]

~~d)~~d) Syntactical errors in packet filters:

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

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

3) 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.

In case 2) the network shall not diagnose an error, further process the new activation request and, if it was processed successfully, delete the old packet filters which have identical filter precedence values. Furthermore, by means of explicit peer-to-peer signalling between the MS and the network, the network shall deactivate the PDP context(s) for which it has deleted the packet filters.

Otherwise ~~T~~the network shall reject the activation request with cause "syntactical errors in packet filter(s)". [*Format changed to B1*]

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

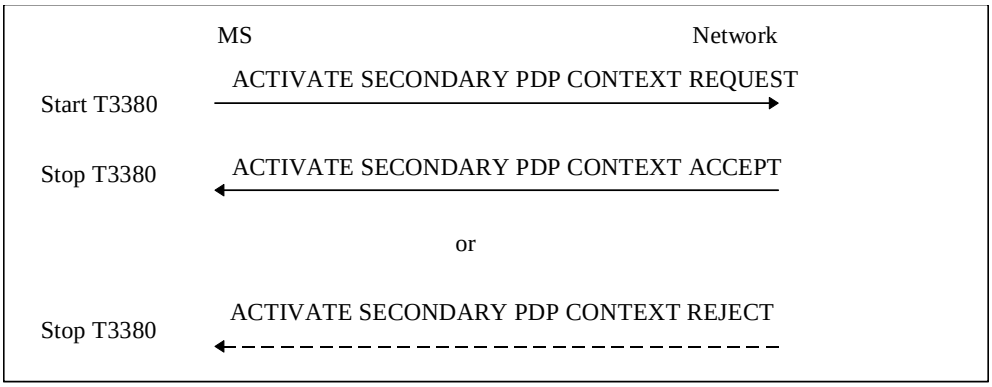

Figure 6.5/3GPP TS 24.008: MS initiated secondary PDP context activation procedure

6.1.3.3.3 MS initiated PDP Context Modification not accepted 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;

32: Service option not supported;

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);

95 - 111: protocol errors.

If upon the reception of a MODIFY PDP CONTEXT REQUEST message the network fails to re-establish the radio access bearer for a PDP context whose maximum bit rate in uplink and downlink is set to 0kbit/s, the network shall reply with MODIFY PDP CONTEXT REJECT with cause "insufficient resources".

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

a) Semantic errors in TFT operations:

~~I.~~1) *TFT operation* = "Create a new TFT" when there is already an existing TFT for the PDP context.

~~II.~~2) When the *TFT operation* is an operation other than "Create a new TFT" and there is no TFT for the PDP context.

~~III.~~3) *TFT operation* = "Delete existing TFT" when there is already another PDP context with the same PDP address and APN without a TFT.

~~IV.~~4) *TFT operation* = "Delete packet filters from existing TFT" when it would render the TFT empty.

In these cases the network shall not diagnose an error and perform the following actions to resolve the inconsistency:

In case 1) the network shall further process the new activation request and, if it was processed successfully, delete the old TFT.

In case 2) the network shall:

- further process the new request and, if no error according to list items b), c), and d) was detected, consider the TFT as successfully deleted, if the TFT operation is "Delete existing TFT" or "Delete packet filters from existing TFT";

- process the new request as an activation request, if the TFT operation is "Add packet filters in existing TFT" or "Replace packet filters in existing TFT".

In case 3) the network shall process the new deletion request and, after successful deletion of the TFT, deactivate the old PDP context with the same PDP address and APN without a TFT by explicit peer-to-peer signalling between the MS and the network.

In case 4) the network shall further process the new request and, if no error according to list items b), c), and d) was detected, delete the existing TFT. After successful deletion of the TFT, if there was already another PDP context with the same PDP address and APN without a TFT, the network shall deactivate this old PDP context without a TFT by explicit peer-to-peer signalling between the MS and the network.

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

b) Syntactical errors in TFT operations:

~~I.~~1) When the *TFT operation* is an operation other than "Delete existing TFT" and the packet filter list in the TFT IE is empty.

~~II.~~2) *TFT operation* = "Delete existing TFT" with a non-empty packet filter list in the TFT IE.

~~III.~~3) *TFT operation* = "Replace packet filters in existing TFT" when a to be replaced packet filter does not exist in the original TFT.

~~IV.~~4) *TFT operation* = "Delete packet filters from existing TFT" when a to be deleted packet filter does not exist in the original TFT.

~~V.~~5) *TFT operation* = "Delete packet filters from existing TFT" with a packet filter list also including packet filters in addition to the ~~instead of~~ packet filter identifiers.

~~VI.~~6) 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.

In case 3) the network shall not diagnose an error, further process the replace request and, if no error according to list items c) and d) was detected, include the packet filters received to the existing TFT.

In case 4) the network shall not diagnose an error, further process the deletion request and, if no error according to list items c) and d) was detected, consider the respective packet filter as successfully deleted.

Otherwise t~~T~~he network shall reject the modification ~~activation~~ request with cause "syntactical error in the TFT operation".[*Format changed to B1*]

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 the present document.

The network shall reject the modification ~~activation~~ request with cause "semantic errors in packet filter(s)". [*Format changed to B1*]

d) Syntactical errors in packet filters:

~~I.~~1) 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.~~2) 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 and APN would have identical packet filter precedence values.

~~III.~~3) 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.

In case 1), if two or more packet filters with identical packet filter identifiers are contained in the new request, the network shall reject the modification request with cause "syntactical errors in packet filter(s)". Otherwise, the network shall not diagnose an error, further process the new request and, if it was processed successfully, delete the old packet filters which have the identical packet filter identifiers.

In case 2) the network shall not diagnose an error, further process the new request and, if it was processed successfully, delete the old packet filters which have identical filter precedence values. Furthermore, by means of explicit peer-to-peer signalling between the MS and the network, the network shall deactivate the PDP context(s) for which it has deleted the packet filters.

Otherwise t~~T~~he network shall reject the modification ~~activation~~ request with cause "syntactical errors in packet filter(s)". *[Format changed to B1]*

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

*** next section for information only ***

8.3.2 Session Management

The mobile station and network shall ignore a session management message with TI EXT bit = 0. Otherwise, the following procedures shall apply:

a) Whenever any session management message except ACTIVATE PDP CONTEXT REQUEST, ACTIVATE SECONDARY PDP CONTEXT REQUEST, or SM-STATUS is received by the network specifying a transaction identifier which is not recognized as relating to an active context or to a context that is in the process of activation or deactivation, the network shall send a SM-STATUS message with cause #81 "invalid transaction identifier value" using the received transaction identifier value including the extension octet and remain in the PDP-INACTIVE state.

b) Whenever any session management message except REQUEST PDP CONTEXT ACTIVATION or SM-STATUS is received by the MS specifying a transaction identifier which is not recognized as relating to an active context or to a context that is in the process of activation or deactivation, the MS shall send a SM-STATUS message with cause #81 "invalid transaction identifier value" using the received transaction identifier value including the extension octet and remain in the PDP-INACTIVE state.

c) When a REQUEST PDP CONTEXT ACTIVATION message is received by the MS with a transaction identifier flag set to "1", this message shall be ignored.

d) When an ACTIVATE PDP CONTEXT REQUEST message is received by the network specifying a transaction identifier which is not recognized as relating to a context that is in the process of activation, and with a transaction identifier flag set to "1", this message shall be ignored.

e) Whenever an ACTIVATE PDP CONTEXT REQUEST or ACTIVATE SECONDARY PDP CONTEXT REQUEST message is received by the network specifying a transaction identifier relating to a PDP context not in state PDP-INACTIVE, the network shall deactivate the old PDP context relating to the received transaction identifier without notifying the MS. Furthermore, the network shall continue with the activation procedure of a new PDP context as indicated in the received message.

f) Whenever a REQUEST PDP CONTEXT ACTIVATION message is received by the MS specifying a transaction identifier relating to a PDP context not in state PDP-INACTIVE, the MS shall locally deactivate the old PDP context relating to the received transaction identifier. Furthermore, the MS shall continue with the activation procedure of a new PDP context as indicated in the received message.

g) When an ACTIVATE SECONDARY PDP CONTEXT REQUEST message is received by the network with a transaction identifier flag set to "1", this message shall be ignored.

3GPP TSG-CN1 Meeting #32 **Tdoc N1-031390**
Bangkok, Thailand, 27 – 31 October 2003

CR-Form-v7

CHANGE REQUEST

⌘ **24.008** **CR** **816** ⌘ **rev** **-** ⌘ Current version: **6.2.0** ⌘

*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:	⌘	ePLMN extension
Source:	⌘	T-Mobile
Work item code:	⌘	TEI6
Date:	⌘	01/10/2003
Category:	⌘	**C**
Release:	⌘	Rel-6

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	For some application it is necessary to inform the ME about more than the current 5 ePLMN's
Summary of change:	⌘	The ePLMN list is extended to 16 entries
Consequences if not approved:	⌘	The application will not work sufficiently

Clauses affected:	⌘	4.4.1, 9.2.13, 9.4.2, 9.4.15, 10.5.1.13			
Other specs affected:	⌘	**Y**	**N**		⌘
			X	Other core specifications	
				Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm.
Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

4.4.1 Location updating procedure

The location updating procedure is a general procedure which is used for the following purposes:

- normal location updating (described in this subclause);
- periodic updating (see subclause 4.4.2);
- IMSI attach (see subclause 4.4.3).

The normal location updating procedure is used to update the registration of the actual Location Area of a mobile station in the network. The location updating type information element in the LOCATION UPDATING REQUEST message shall indicate normal location updating. The conditions under which the normal location updating procedure is used by a mobile station in the MM IDLE state are defined for each service state in subclause 4.2.2.

Only applicable for mobile stations supporting VGCS listening or VBS listening: A mobile station in RR group receive mode is in the MM IDLE state, substate RECEIVING GROUP CALL (NORMAL SERVICE) or RECEIVING GROUP CALL (LIMITED SERVICE). To perform a location updating, the MS in RR group receive mode shall leave the group receive mode, establish an independent dedicated RR connection to perform the location updating as described above and return to the RR group receive mode afterwards.

The normal location updating procedure shall also be started if the network indicates that the mobile station is unknown in the VLR as a response to MM connection establishment request.

To limit the number of location updating attempts made, where location updating is unsuccessful, an attempt counter is used. The attempt counter is reset when a mobile station is switched on or a SIM/USIM card is inserted.

Upon successful location updating the mobile station sets the update status to UPDATED in the SIM/USIM, and stores the received Location Area Identification in the SIM/USIM. The attempt counter shall be reset.

The detailed handling of the attempt counter is described in subclauses 4.4.4.6 to 4.4.4.9.

The Mobile Equipment shall contain a list of "forbidden location areas for roaming", as well as a list of "forbidden location areas for regional provision of service". These lists shall be erased when the MS is switched off or when the SIM/USIM is removed, and periodically (with period in the range 12 to 24 hours). The location area identification received on the BCCH that triggered the location updating request shall be added to the suitable list whenever a location update reject message is received with the cause "Roaming not allowed in this location area" or with the cause "Location Area not allowed". The lists shall accommodate each 10 or more location area identifications. When the list is full and a new entry has to be inserted, the oldest entry shall be deleted.

The Mobile Equipment shall store a list of "equivalent PLMNs". This list is replaced or deleted at the end of each location update procedure, routing area update procedure and GPRS attach procedure. The stored list consists of a list of equivalent PLMNs as downloaded by the network plus the PLMN code of the network that downloaded the list. The stored list shall not be deleted when the MS is switched off. The stored list shall be deleted if the SIM/USIM is removed. The maximum number of possible entries in the stored list is ~~six~~16.

The cell selection processes in the different states are described in 3GPP TS 43.022 [82] and 3GPP TS 45.008 [34].

The location updating procedure is always initiated by the mobile station.

9.2.13 Location updating accept

This message is sent by the network to the mobile station to indicate that updating or IMSI attach in the network has been completed. See table 9.2.15/3GPP TS 24.008.

Message type: LOCATION UPDATING ACCEPT

Significance: dual

Direction: network to mobile station

Table 9.2.15/3GPP TS 24.008: LOCATION UPDATING ACCEPT message content

IEI	Information element	Type/Reference	Presence	Format	Length
	Mobility management protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Skip Indicator	Skip Indicator 10.3.1	M	V	1/2
	Location Updating Accept message type	Message type 10.4	M	V	1
	Location area identification	Location area identification 10.5.1.3	M	V	5
17	Mobile identity	Mobile identity 10.5.1.4	O	TLV	3-10
A1	Follow on proceed	Follow on proceed 10.5.3.7	O	T	1
A2	CTS permission	CTS permission 10.5.3.10	O	T	1
4A	Equivalent PLMNs	PLMN list 10.5.1.13	O	TLV	5-~~1~~47
34	Emergency Number List	Emergency Number List 10.5.3.13	O	TLV	5-50

9.2.13.1 Follow on proceed

The *follow on proceed* information element appears if the network wishes to indicate that the mobile station may attempt an MM connection establishment using the same RR connection.

9.2.13.2 CTS permission

The *CTS permission* information element appears if the network wishes to allow the mobile station to use GSM-Cordless Telephony System in the Location Area.

9.2.13.3 Equivalent PLMNs

The *Equivalent PLMNs* information element is included if the network wants to inform the mobile station of equivalent PLMNs.

9.2.13.4 Emergency Number List

This IE may be sent by the network. If this IE is sent, the contents of this IE indicates a list of emergency numbers valid within the same MCC as in the cell on which this IE is received.

9.4.2 Attach accept

This message is sent by the network to the MS to indicate that the corresponding attach request has been accepted. See table 9.4.2/3GPP TS 24.008.

Message type: ATTACH ACCEPT

Significance: dual

Direction: network to MS

Table 9.4.2/3GPP TS 24.008: ATTACH ACCEPT message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Skip indicator	Skip indicator 10.3.1	M	V	1/2
	Attach accept message identity	Message type 10.4	M	V	1
	Attach result	Attach result 10.5.5.1	M	V	1/2
	Force to standby	Force to standby 10.5.5.7	M	V	1/2
	Periodic RA update timer	GPRS Timer 10.5.7.3	M	V	1
	Radio priority for SMS	Radio priority 10.5.7.2	M	V	1/2
	Radio priority for TOM8	Radio priority 2 10.5.7.5	M	V	1/2
	Routing area identification	Routing area identification 10.5.5.15	M	V	6
19	P-TMSI signature	P-TMSI signature 10.5.5.8	O	TV	4
17	Negotiated READY timer value	GPRS Timer 10.5.7.3	O	TV	2
18	Allocated P-TMSI	Mobile identity 10.5.1.4	O	TLV	7
23	MS identity	Mobile identity 10.5.1.4	O	TLV	7-10
25	GMM cause	GMM cause 10.5.5.14	O	TV	2
2A	T3302 value	GPRS Timer 2 10.5.7.4	O	TLV	3
8C	Cell Notification	Cell Notification 10.5.5.21	O	T	1
4A	Equivalent PLMNs	PLMN List 10.5.1.13	O	TLV	5-~~1~~47
B-	Network feature support	Network feature support 10.5.5.23	O	TV	1
34	Emergency Number List	Emergency Number List 10.5.3.13	O	TLV	5-50

9.4.2.1 P-TMSI signature

This IE may be included to assign an identity to the MS's GMM context.

9.4.2.2 Negotiated READY timer

This IE may be included to indicate a value for the READY timer.

9.4.2.3 Allocated P-TMSI

This IE may be included to assign a P-TMSI to an MS in case of a GPRS or combined GPRS attach.

9.4.2.4 MS identity

This IE may be included to assign or unassign a TMSI to an MS in case of a combined GPRS attach.

9.4.2.5 GMM cause

This IE shall be included when IMSI attach for non-GPRS services was not successful during a combined GPRS attach procedure.

9.4.2.6 T3302 value

This IE may be included to indicate a value for the T3302 timer.

9.4.2.7 Cell Notification (GSM only)

In GSM, this IE shall be included by the SGSN in order to indicate the ability to support the Cell Notification.

9.4.2.8 Equivalent PLMNs

The *Equivalent PLMNs* information element is included if the network wants to inform the mobile station of equivalent PLMNs.

9.4.2.9 Network feature support

This IE may be included to inform the MS of the support of certain features. If this IE is not included then the respective features are not supported.

9.4.2.10 Emergency Number List

This IE may be sent by the network. If this IE is sent, the contents of this IE indicates a list of emergency numbers valid within the same MCC as in the cell on which this IE is received.

9.4.15 Routing area update accept

This message is sent by the network to the MS to provide the MS with GPRS mobility management related data in response to a *routing area update request* message. See table 9.4.15/3GPP TS 24.008.

Message type: ROUTING AREA UPDATE ACCEPT

Significance: dual

Direction: network to MS

Table 9.4.15/3GPP TS 24.008: ROUTING AREA UPDATE ACCEPT message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Skip indicator	Skip indicator 10.3.1	M	V	1/2
	Routing area update accept message identity	Message type 10.4	M	V	1
	Force to standby	Force to standby 10.5.5.7	M	V	1/2
	Update result	Update result 10.5.5.17	M	V	1/2
	Periodic RA update timer	GPRS Timer 10.5.7.3	M	V	1
	Routing area identification	Routing area identification 10.5.5.15	M	V	6
19	P-TMSI signature	P-TMSI signature 10.5.5.8	O	TV	4
18	Allocated P-TMSI	Mobile identity 10.5.1.4	O	TLV	7
23	MS identity	Mobile identity 10.5.1.4	O	TLV	7-10
26	List of Receive N-PDU Numbers	Receive N-PDU Number list 10.5.5.11	O	TLV	4 - 19
17	Negotiated READY timer value	GPRS Timer 10.5.7.3	O	TV	2
25	GMM cause	GMM cause 10.5.5.14	O	TV	2
2A	T3302 value	GPRS Timer 2 10.5.7.4	O	TLV	3
8C	Cell Notification	Cell Notification 10.5.5.21	O	T	1
4A	Equivalent PLMNs	PLMN List 10.5.1.13	O	TLV	5-~~1~~4<u></u>7
32	PDP context status	PDP context status 10.5.7.1	O	TLV	4
B-	Network feature support	Network feature support 10.5.5.23	O	TV	1
34	Emergency Number List	Emergency Number List 10.5.3.13	O	TLV	5-50

9.4.15.1 P-TMSI signature

This IE may be included to assign an identity to the MS's GMM context.

9.4.15.2 Allocated P-TMSI

This IE may be included to assign a P-TMSI to an MS in case of a GPRS or combined routing area updating procedure.

9.4.15.3 MS identity

This IE may be included to assign or unassign a TMSI to a MS in case of a combined routing area updating procedure.

9.4.15.4 List of Receive N-PDU Numbers

This IE shall be included in case of an inter SGSN routing area updating, if there are PDP contexts that have been activated in acknowledged transfer mode.

9.4.15.5 Negotiated READY timer value

This IE may be included to indicate a value for the READY timer.

9.4.15.6 GMM cause

This IE shall be included if the combined GPRS routing area updating procedure was successful for GPRS services only.

9.4.15.7 T3302 value

This IE may be included to indicate a value for the T3302 timer.

9.4.15.8 Cell Notification (GSM only)

In GSM, this IE shall be included if by the SGSN in order to indicate the ability to support the Cell Notification.

9.4.15.9 Equivalent PLMNs

The *Equivalent PLMNs* information element is included if the network wants to inform the mobile station of equivalent PLMNs.

9.4.15.10 PDP context status

This IE shall be included by the NW.

9.4.15.11 Network feature support

This IE may be included to inform the MS of the support of certain features. If this IE is not included then the respective features are not supported.

9.4.15.12 Emergency Number List

This IE may be sent by the network. If this IE is sent, the contents of this IE indicates a list of emergency numbers valid within the same MCC as in the cell on which this IE is received.

10.5.1.13 PLMN list

The purpose of the *PLMN List* information element is to provide a list of PLMN codes to the mobile station.

The *PLMN List* information element is coded as shown in figure 10.5.13/3GPP TS 24.008 and table 10.5.13/3GPP TS 24.008.

The *PLMN List* is a type 4 information element with a minimum length of 5 octets and a maximum length of ~~1~~47 octets.

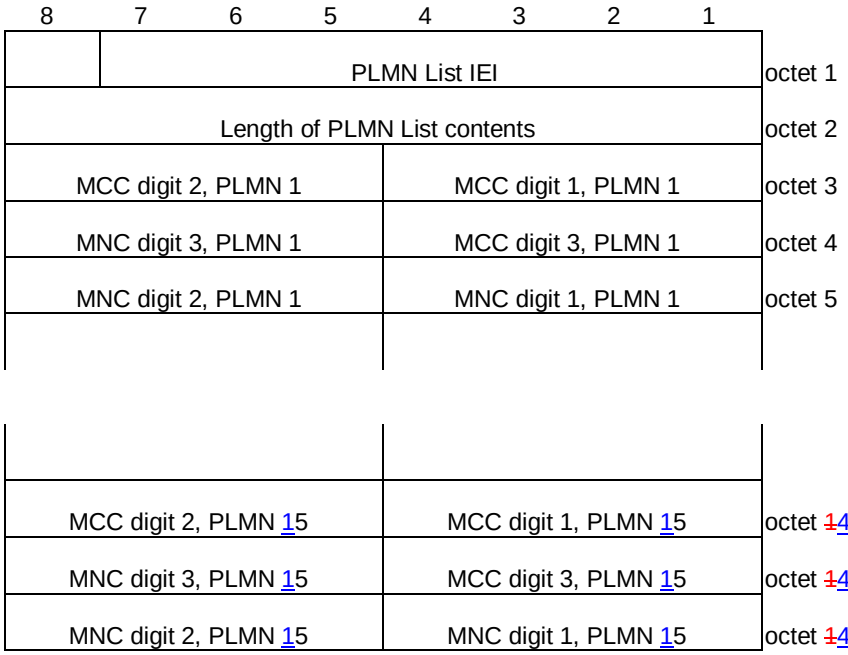

Figure 10.5.13/3GPP TS 24.008 *PLMN List* information element

Table 10.5.13/3GPP TS 24.008: *PLMN List* information element

MCC, Mobile country code (octet 3, octet 4 bits 1 to 4) The MCC field is coded as in ITU-T Rec. E212, Annex A. MNC, Mobile network code (octet 5, octet 4 bits 5 to 8). The coding of this field is the responsibility of each administration but BCD coding shall be used. The MNC shall consist of 2 or 3 digits. For PCS 1900 for NA, Federal regulation mandates that a 3-digit MNC shall be used. However a network operator may decide to use only two digits in the MNC over the radio interface. In this case, bits 5 to 8 of octet 4 shall be coded as "1111". Mobile equipment shall accept MNC coded in such a way.

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CHANGE REQUEST

⌘ **24.008** **CR** **818** ⌘ **rev** **1** ⌘ Current version: **6.2.0** ⌘

*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 [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	SM signalling in case tear down is requested
Source:	⌘	Siemens AG
Work item code:	⌘	TEI-6
Date:	⌘	21/10/2003
Category:	⌘	**F**
Release:	⌘	Rel-6

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	1) Its is not clearly specified in TS 24.008 how the receiver should behave once a tear down of the linked PDP contexts is requested. 2) Only contexts having both the same PDP address **and the same APN** belong to the same group of linked PDP contexts and shall be affected by the tear down.
Summary of change:	⌘	It is clarified that if the tear down is requested all other active PDP contexts sharing the same PDP address and APN as the PDP context associated with this specific TI shall be deactivated locally without peer to peer signalling.
Consequences if not approved:	⌘	1) Risk that the receiver of a tear down request is either triggering explicit PDP context deactivation procedures for all link contexts or is awaiting that the peer entity will perform PDP context deactivation procedures for all liked contexts. 2) Risk that other PDP contexts with the same PDP address but different APNs are deactivated when a PDP context deactivation with tear down is requested.

Clauses affected:	⌘	6.1.3.4

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

Other comments:	⌘	

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. 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 and APN as the PDP context associated with this specific TI shall be deactivated. If the tear down is requested, all other active PDP contexts sharing the same PDP address and APN as the PDP context associated with this specific TI shall be deactivated locally without peer-to-peer signalling. 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.

After successful PDP context deactivation, the associated NSAPI and TI values are released and can be reassigned to another PDP context.

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 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.

6.1.3.4.2 PDP context deactivation initiated by the network

In order to deactivate a PDP context, the network sends a DEACTIVATE PDP CONTEXT REQUEST message to the MS and starts timer T3395. The message contains the transaction identifier in use for the PDP context to be deactivated and a cause code that typically indicates one of the following causes:

8: Operator Determined Barring;

25: LLC or SNDCP failure (GSM only);

36: regular PDP context deactivation;

38: network failure; or

39: reactivation requested.

The MS shall, upon receipt of this message, reply with a DEACTIVATE PDP CONTEXT ACCEPT message. Upon receipt of the DEACTIVATE PDP CONTEXT ACCEPT message, the network shall stop the timer T3395. 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.

6.1.3.4.3 Abnormal cases

The following abnormal cases can be identified:

a) Expiry of timers

In the mobile station:

On the first expiry of timer T3390, the MS shall resent the message DEACTIVATE PDP CONTEXT REQUEST and shall reset and restart the timer T3390. This retransmission is repeated four times, i.e. on the fifth expiry of timer T3390, the MS shall release all resources allocated and shall erase the PDP context related data.

On the network side:

On the first expiry of timer T3395, the network shall resent the message DEACTIVATE PDP CONTEXT REQUEST and shall reset and restart timer T3395. This retransmission is repeated four times, i.e. on the fifth expiry of timer T3395, the network shall erase the PDP context related data for that MS.

b) Collision of MS and network initiated PDP context deactivation requests

If the MS and the network initiated PDP context deactivation requests collide, the MS and the network shall each reply with the messages DEACTIVATE PDP CONTEXT ACCEPT and shall stop timer T3390 and T3395, respectively.

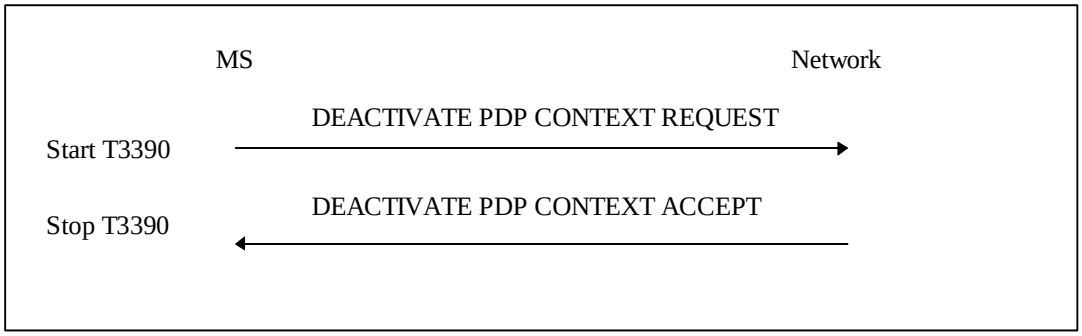

Figure 6.8/3GPP TS 24.008: MS initiated PDP context deactivation procedure

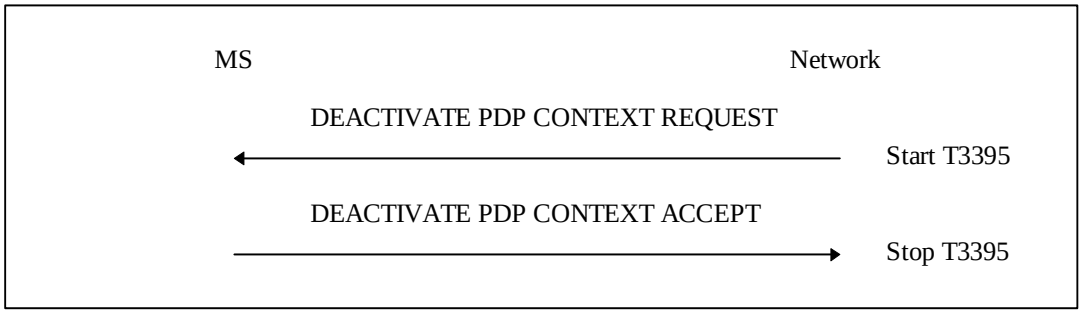

Figure 6.9/3GPP TS 24.008: Network initiated PDP context deactivation procedure

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Bangkok, Thailand, 27 – 31 October 2003

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CHANGE REQUEST

⌘ **24.008** **CR** **820** ⌘ **rev** **-** ⌘ Current version: **6.2.0** ⌘

*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 [X] Radio Access Network [X] Core Network [ ]

Title:	⌘	Order of frequency bands in MS Radio Access Capability IE
Source:	⌘	Siemens AG
Work item code:	⌘	TEI-6
Date:	⌘	15/10/2003
Category:	⌘	**F**
Release:	⌘	Rel-6

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The current definition in which order the radio access capabilities shall be included in the MS RAC IE if the alternative coding by using the Additional access technologies structure is chosen by the mobile station is in contradiction to the rule, that the MS shall provide the network with its radio access capabilities for the frequency bands it supports, in the same order of priority as specified by the network. As the possibility to specify the order is optional for the network the MS behavior needs to be defined for both cases.
Summary of change:	⌘	It is clarified that the requested order shall be applied if available, otherwise the serving BCCH frequency band shall be included on the first position.
Consequences if not approved:	⌘	Inconsistent definition in which order the frequency bands shall be indicated by the MS in the MS Radio Access Capability IE.

Clauses affected:	⌘	10.5.5.12a			
Other specs affected:	⌘	**Y** / **N**	Other core specifications	⌘	44.060
		X /	Other core specifications		
		/ X	Test specifications		
		/ X	O&M Specifications		
Other comments:	⌘				

10.5.5.12a MS Radio Access capability

The purpose of the *MS RA capability* information element is to provide the radio part of the network with information concerning radio aspects of the mobile station. The contents might affect the manner in which the network handles the operation of the mobile station.

The *MS RA capability* is a type 4 information element, with a maximum length of 52 octets.

The value part of a *MS RA capability* information element is coded a shown table 10.5.146/3GPP TS 24.008.

For the indication of the radio access capabilities ~~Access Technology Types~~ the following conditions shall apply:

- Among the three Access Type Technologies GSM 900-P, GSM 900-E and GSM 900-R only one shall be present.
- Due to shared radio frequency channel numbers between GSM 1800 and GSM 1900, the mobile station should provide the relevant radio access capability for either GSM 1800 band OR GSM 1900 band, not both.
- The MS shall indicate its supported Access Technology Types during a single MM procedure.
- If the alternative coding by using the Additional access technologies struct is chosen by the mobile station, the mobile station shall indicate its radio access capability for the serving BCCH frequency band in the first included Access capabilities struct, if this information element is not sent in response to an Access Technologies Request from the network or if none of the requested Access Technology Types is supported by the MS. Otherwise, the mobile station shall include the radio access capabilities for the frequency bands it supports in the order of priority requested by the network (see 3GPP TS 44.060).
- The first Access Technology Type shall not be set to "1111".

For error handling the following shall apply:

- If a received Access Technology Type is unknown to the receiver, it shall ignore all the corresponding fields.
- If within a known Access Technology Type a receiver recognizes an unknown field it shall ignore it.
- For more details about error handling of MS radio access capability see 3GPP TS 48.018 [86].

Table 10.5.146/3GPP TS 24.008: *Mobile Station Radio Access Capability* Information Element

<**MS RA capability value part** : < MS RA capability value part struct >>
<spare bits>**; -- *may be used for future enhancements*

<MS RA capability value part struct >::= *--recursive structure allows any number of Access technologies*
{ { < **Access Technology Type**: bit (4) > exclude 1111
< **Access capabilities** : <Access capabilities struct> > }

| { < **Access Technology Type**: bit (4) == 1111 > -- *structure adding Access technologies with same capabilities*
< **Length** : bit (7) > -- *length in bits of list of Additional access technologies and spare bits*
{ 1 < **Additional access technologies**: < Additional access technologies struct > > } ** 0
<spare bits>** } }

{ 0 | 1 <MS RA capability value part struct> } ;

< Additional access technologies struct > ::=
< **Access Technology Type** : bit (4) >
< **GMSK Power Class** : bit (3) >
< **8PSK Power Class** : bit (2) > ;

< Access capabilities struct > ::=
< **Length** : bit (7) > -- length in bits of Content and spare bits
<Access capabilities : <Content>>
<spare bits>** ; -- expands to the indicated length
-- may be used for future enhancements

< Content > ::=
< **RF Power Capability** : bit (3) >
{ 0 | 1 <**A5 bits** : <A5 bits> > } -- *zero means that the same values apply for parameters as in the immediately preceding Access capabilities field within this IE*
< **ES IND** : bit >
< **PS** : bit >
< **VGCS** : bit >
< **VBS** : bit >
{ 0 | 1 < **Multislot capability** : Multislot capability struct > } -- *zero means that the same values for multislot parameters as given in an earlier Access capabilities field within this IE apply also here*
-- *Additions in release 99*
{ 0 | 1 < **8PSK Power Capability** : bit(2) >} -- *'1' also means 8PSK modulation capability in uplink.*
< **COMPACT Interference Measurement Capability : bit >**
< **Revision Level Indicator** : bit >
< **UMTS FDD Radio Access Technology Capability** : bit > -- *3G RAT*
< **UMTS 3.84 Mcps TDD Radio Access Technology Capability** : bit > -- *3G RAT*
< **CDMA 2000 Radio Access Technology Capability** : bit > -- *3G RAT*
-- *Additions in release 4*
< **UMTS 1.28 Mcps TDD Radio Access Technology Capability**: bit > -- *3G RAT*
< **GERAN Feature Package 1** : bit >
{ 0 | 1 < **Extended DTM GPRS Multi Slot Class** : bit(2) >
< **Extended DTM EGPRS Multi Slot Class** : bit(2) > }
< Modulation based multislot class support : bit >
-- *Additions in release 5*
{ 0 | 1 < **High Multislot Capability** : bit(2) > }
< **GERAN Iu Mode Capability** : bit >
{ 0 | 1 < GMSK_MULTISLOT_POWER_PROFILE : bit (2) >
< 8-PSK_MULTISLOT_POWER_PROFILE : bit (2) > };

-- error: struct too short, assume features do not exist
-- error: struct too long, ignore data and jump to next Access technology

Table 10.5.146/3GPP TS 24.008 (continued): *Mobile Station Radio Access Capability* IE

< Multislot capability struct > ::=
{ 0 | 1 < **HSCSD multislot class** : bit (5) > }
{ 0 | 1 < **GPRS multislot class** : bit (5) > < **GPRS Extended Dynamic Allocation Capability** : bit > }
{ 0 | 1 < **SMS_VALUE** : bit (4) > < **SM_VALUE** : bit (4) > }
-- *Additions in release 99*
{ 0 | 1 < **ECSD multislot class** : bit (5) > }
{ 0 | 1 < **EGPRS multislot class** : bit (5) > < **EGPRS Extended Dynamic Allocation Capability** : bit > }
{0 | 1 < **DTM GPRS Multi Slot Class**: bit(2)>
<Single Slot DTM : bit>
{0 | 1 <**DTM EGPRS Multi Slot Class** : bit(2)> } } ;
-- error: struct too short, assume features do not exist

<A5 bits> ::= < A5/1 : bit> <A5/2 : bit> <A5/3 : bit> <A5/4 : bit> <A5/5 : bit> <A5/6 : bit> <A5/7 : bit>; -- bits for circuit mode ciphering algorithms. These fields are not used by the network and may be excluded by the MS.

Access Technology Type
This field indicates the access technology type to be associated with the following access capabilities.

Bits
4 3 2 1
0 0 0 0 GSM P
0 0 0 1 GSM E --*note that GSM E covers GSM P*
0 0 1 0 GSM R --*note that GSM R covers GSM E and GSM P*
0 0 1 1 GSM 1800
0 1 0 0 GSM 1900
0 1 0 1 GSM 450
0 1 1 0 GSM 480
0 1 1 1 GSM 850
1 0 0 0 GSM 700
1 0 0 1 GSM T 380
1 0 1 0 GSM T 410
1 0 1 1 GSM T 900
1 1 1 1 Indicates the presence of a list of Additional access technologies
All other values are treated as unknown by the receiver.

A MS which does not support any GSM access technology type shall set this field to '0000'.

RF Power Capability, GMSK Power Class (3 bit field)
This field contains the binary coding of the power class used for GMSK associated with the indicated Access Technology Type (see 3GPP TS 45.005).

A MS which does not support any GSM access technology type shall set this field to '000'.

8PSK Power Capability (2 bit field)
If 8-PSK modulation is supported for uplink, this field indicates the radio capability for 8-PSK modulation. The following coding is used (see 3GPP TS 45.005 [33]):
Bits 2 1
0 0 Reserved
0 1 Power class E1
1 0 Power class E2
1 1 Power class E3

8PSK Power Class (2 bit field)
This field indicates the radio capability for 8-PSK modulation. The following coding is used (see 3GPP TS 45.005):
Bits 2 1
0 0 8PSK modulation not supported for uplink
0 1 Power class E1
1 0 Power class E2
1 1 Power class E3

Additional access technologies struct
This structure contains the GMSK Power Class and 8PSK Power Class for an additional Access Technology. All other capabilities for this indicated Access Technology are the same as the capabilities indicated by the preceding Access capabilities struct.

A5/1
0 encryption algorithm A5/1 not available
1 encryption algorithm A5/1 available
A5/2
0 encryption algorithm A5/2 not available
1 encryption algorithm A5/2 available
A5/3
0 encryption algorithm A5/3 not available
1 encryption algorithm A5/3 available
A5/4
0 encryption algorithm A5/4 not available
1 encryption algorithm A5/4 available
A5/5
0 encryption algorithm A5/5 not available
1 encryption algorithm A5/5 available
A5/6
0 encryption algorithm A5/6 not available
1 encryption algorithm A5/6 available
A5/7
0 encryption algorithm A5/7 not available
1 encryption algorithm A5/7 available

ES IND – (Controlled early Classmark Sending)
0 "controlled early Classmark Sending" option is not implemented
1 "controlled early Classmark Sending" option is implemented

Table 10.5.146/3GPP TS 24.008 (concluded): *Mobile Station Radio Access Capability* IE

PS – (Pseudo Synchronisation)
0 PS capability not present
1 PS capability present

VGCS – (Voice Group Call Service)
0 no VGCS capability or no notifications wanted
1 VGCS capability and notifications wanted.

VBS – (Voice Broadcast Service)
0 no VBS capability or no notifications wanted
1 VBS capability and notifications wanted

HSCSD Multi Slot Class
The Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 45.002 [32]. This field is not used by the network and may be excluded by the MS.
Range 1 to 18, all other values are reserved.

GPRS Multi Slot Class
The GPRS Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 45.002 [32].

ECSD Multi Slot Class
The presence of this field indicates ECSD capability. Whether the MS is capable of 8-PSK modulation in uplink is indicated by the presence of 8-PSK Power Capability field. The Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 45.002 [32]. This field is not used by the network and may be excluded by the MS.
Range 1 to 18, all other values are reserved.

EGPRS Multi Slot Class
The presence of this field indicates EGPRS capability. Whether the MS is capable of 8-PSK modulation in uplink is indicated by the presence of 8-PSK Power Capability field. The EGPRS Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 45.002 [32].

GPRS Extended Dynamic Allocation Capability
0 Extended Dynamic Allocation Capability for GPRS is not implemented
1 Extended Dynamic Allocation Capability for GPRS is implemented

EGPRS Extended Dynamic Allocation Capability
0 Extended Dynamic Allocation Capability for EGPRS is not implemented
1 Extended Dynamic Allocation Capability for EGPRS is implemented

SMS_VALUE (Switch-Measure-Switch) (4 bit field)
The SMS field indicates the time needed for the mobile station to switch from one radio channel to another, perform a neighbor cell power measurement, and the switch from that radio channel to another radio channel. This field is not used by the network and may be excluded by the MS.
Bits
4 3 2 1
0 0 0 0 1/4 timeslot (~144 microseconds)
0 0 0 1 2/4 timeslot (~288 microseconds)
0 0 1 0 3/4 timeslot (~433 microseconds)
. . .
1 1 1 1 16/4 timeslot (~2307 microseconds)

(SM_VALUE) Switch-Measure (4 bit field)
The SM field indicates the time needed for the mobile station to switch from one radio channel to another and perform a neighbour cell power measurement. This field is not used by the network and may be excluded by the MS.
Bits
4 3 2 1
0 0 0 0 1/4 timeslot (~144 microseconds)
0 0 0 1 2/4 timeslot (~288 microseconds)
0 0 1 0 3/4 timeslot (~433 microseconds)
. . .
1 1 1 1 16/4 timeslot (~2307 microseconds)

DTM GPRS Multi Slot Class (2 bit field)
This field indicates the DTM GPRS multislot capabilities of the MS. It is coded as follows:
Bits
2 1
0 0 Unused. If received, the network shall interpret this as '01'
0 1 Multislot class 5 supported
1 0 Multislot class 9 supported
1 1 Multislot class 11 supported

Single Slot DTM (1 bit field)
This field indicates whether the MS supports single slot DTM operation (see 3GPP TS 43.055 [87]).
Bit
0 Single Slot DTM not supported
1 Single Slot DTM supported

An MS indicating support for Extended DTM GPRS multislot class or Extended DTM EGPRS multislot class shall set this bit to '1'. The network may ignore the bit in this case.

DTM EGPRS Multi Slot Class (2 bit field)
This field indicates the DTM EGPRS multislot capabilities of the MS. This field shall be included only if the mobile station supports EGPRS DTM. This field is coded as the DTM GPRS multislot Class field.

COMPACT Interference Measurement Capability (1 bit field)
0 COMPACT Interference Measurement Capability is not implemented
1 COMPACT Interference Measurement Capability is implemented

Revision Level Indicator (1 bit field)
Bit
0 The ME is Release '98 or older
1 The ME is Release '99 onwards

UMTS FDD Radio Access Technology Capability (1 bit field)
Bit
0 UMTS FDD not supported
1 UMTS FDD supported

UMTS 3.84 Mcps TDD Radio Access Technology Capability (1 bit field)
Bit
0 UMTS 3.84 Mcps TDD not supported
1 UMTS 3.84 Mcps TDD supported

CDMA 2000 Radio Access Technology Capability (1 bit field)
Bit
0 CDMA 2000 not supported
1 CDMA 2000 supported

UMTS 1.28 Mcps TDD Radio Access Technology Capability (1 bit field)
Bit
0 UMTS 1.28 Mcps TDD not supported
1 UMTS 1.28 Mcps TDD supported

GERAN Feature Package 1 (1 bit field)
This field indicates whether the MS supports the GERAN Feature Package 1 (see 3GPP TS 44.060). It is coded as follows:

0 GERAN feature package 1 not supported.
1 GERAN feature package 1 supported.

Extended DTM GPRS Multi Slot Class (2 bit field)
This field indicates the extended DTM GPRS capabilities of the MS and shall be interpreted in conjunction with the DTM GPRS Multi Slot Class field. It is coded as follows, where 'DGMSC' denotes the DTM GPRS multislot class field:

DGMSC Bit	2 1	**Bit 2 1**	
	0 0	**0 0**	Unused. If received, it shall be interpreted as '01 00'
	0 0	**0 1**	Unused. If received, it shall be interpreted as '01 00'
	0 0	**1 0**	Unused. If received, it shall be interpreted as '01 00'
	0 0	**1 1**	Unused. If received, it shall be interpreted as '01 00'
	0 1	**0 0**	Multislot class 5 supported

0 1	**0 1**	Multislot class 6 supported
0 1	**1 0**	Unused. If received, it shall be interpreted as ‘01 00’
0 1	**1 1**	Unused. If received, it shall be interpreted as ‘01 00’
1 0	**0 0**	Multislot class 9 supported
1 0	**0 1**	Multislot class 10 supported
1 0	**1 0**	Unused. If received, it shall be interpreted as ’10 00’
1 0	**1 1**	Unused. If received, it shall be interpreted as ’10 00’
1 1	**0 0**	Multislot class 11 supported
1 1	**0 1**	Unused. If received, it shall be interpreted as ’11 00’
1 1	**1 0**	Unused. If received, it shall be interpreted as ’11 00’
1 1	**1 1**	Unused. If received, it shall be interpreted as ’11 00’

The presence of this field indicates that the MS supports combined fullrate and halfrate GPRS channels in the downlink. When this field is not present, the MS supports the multislot class indicated by the *DTM GPRS Multi Slot Class* field.

Extended DTM EGPRS Multislot Class (2 bit field)
This field is not considered when the DTM EGPRS Multislot Class field is not included. This field indicates the extended DTM EGPRS multislot capabilities of the MS and shall be interpreted in conjunction with the DTM EGPRS Multislot Class field. This field is coded as the Extended DTM GPRS Multislot Class field. The presence of this field indicates that the MS supports combined fullrate and halfrate GPRS channels in the downlink. When this field is not present, the MS supports the multislot class indicated by the DTM EGPRS Multi Slot Class field.

Modulation based multislot class support (1 bit field)
Bit
0 "Modulation based multislot class" not supported
1 "Modulation based multislot class" supported

High Multislot Capability (2 bit field)
The High Multislot Capability is individually combined with each multislot class field sent by the MS (the possible multislot class fields are: HSCSD multislot class, ECSD multislot class, GPRS multislot class, EGPRS multislot class, DTM GPRS multislot class, DTM EGPRS multislot class, extended DTM GPRS multislot class and extended DTM EGPRS multislot class) to extend the related multislot class to multislot classes 30 to 45, see 3GPP TS 45.002.
For each multislot class, the following mapping is done:
Bits

2 1	coded multislot class field	actual multislot class
0 0	8	30
0 0	10, 23, 28, 29	39
0 0	11, 20, 25	32
0 0	12, 21, 22, 26, 27	33
0 0	Any other	Multislot Class field value
0 1	8	35
0 1	10, 19, 24	36
0 1	11, 23, 28, 29	45
0 1	12, 21, 22, 26, 27	38
0 1	Any other	Multislot Class field value
1 0	8	40
1 0	10, 19, 24	41
1 0	11, 20, 25	42
1 0	12, 23, 28, 29	44
1 0	Any other	Multislot Class field value
1 1	12, 21, 22, 26, 27	43
1 1	11, 20, 25	37
1 1	10, 19, 24	31
1 1	9, 23, 28, 29	34
1 1	Any other	Multislot Class field value

GERAN Iu Mode Capability (1 bit field)
Bit
0 GERAN Iu mode not supported
1 GERAN Iu mode supported

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CR-Form-v7

CHANGE REQUEST

⌘ **24.008** **CR** **823** ⌘ **rev** **-** ⌘ Current version: **6.2.0** ⌘

*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 timer handling in diagram 4.7.7a
Source:	⌘	Nokia
Work item code:	⌘	TEI6
Date:	⌘	21/10/2003
Category:	⌘	**D**
Release:	⌘	Rel-6

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

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	There is a mistake in diagram 4.7.7a.
Summary of change:	⌘	Diagram 4.7.7a is corrected by replacing “start T3370” with “stop T3370” at reception of IDENTITY RESPONSE and replacing “start T3360” with “stop T3360” at reception of AUTHENTICATION & CIPHERING RESPONSE message.
Consequences if not approved:	⌘	The specification will remian ambiguous.

Clauses affected:	⌘	

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

Other comments:	⌘	

How to create CRs using this form:

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.

4.7.7.6 Abnormal cases

The following abnormal cases can be identified:

a) Lower layer failure

Upon detection of a lower layer failure before the AUTHENTICATION AND CIPHERING RESPONSE is received, the network shall abort the procedure.

b) Expiry of timer T3360

The network shall, on the first expiry of the timer T3360, retransmit the AUTHENTICATION AND CIPHERING REQUEST and shall reset and start timer T3360. This retransmission is repeated four times, i.e. on the fifth expiry of timer T3360, the procedure shall be aborted.

c) Collision of an authentication and ciphering procedure with a GPRS attach procedure

If the network receives an ATTACH REQUEST message before the ongoing authentication procedure has been completed and no GPRS attach procedure is pending on the network (i.e. no ATTACH ACCEPT/REJECT message has to be sent as an answer to an ATTACH REQUEST message), the network shall abort the authentication and ciphering procedure and proceed with the new GPRS attach procedure.

d) Collision of an authentication and ciphering procedure with a GPRS attach procedure when the authentication and ciphering procedure has been caused by a previous GPRS attach procedure

If the network receives an ATTACH REQUEST message before the ongoing authentication procedure has been completed and a GPRS attach procedure is pending (i.e. an ATTACH ACCEPT/REJECT message has still to be sent as an answer to an earlier ATTACH REQUEST message), then:

- If one or more of the information elements in the ATTACH REQUEST message differs from the ones received within the previous ATTACH REQUEST message, the network shall not treat the authentication any further and proceed with the GPRS attach procedure; or

- If the information elements do not differ, then the network shall not treat any further this new ATTACH REQUEST.

Collision of an authentication and ciphering procedure with a GPRS detach procedure

GPRS detach containing cause "power off":

If the network receives a DETACH REQUEST message before the ongoing authentication and ciphering procedure has been completed, the network shall abort the authentication and ciphering procedure and shall progress the GPRS detach procedure.

GPRS detach containing other causes than "power off":

If the network receives a DETACH REQUEST message before the ongoing authentication and ciphering procedure has been completed, the network shall complete the authentication and ciphering procedure and shall respond to the GPRS detach procedure as described in subclause 4.7.4.

e) Collision of an authentication and ciphering procedure with a routing area updating procedure

If the network receives a ROUTING AREA UPDATE REQUEST message before the ongoing authentication procedure has been completed, the network shall progress both procedures.

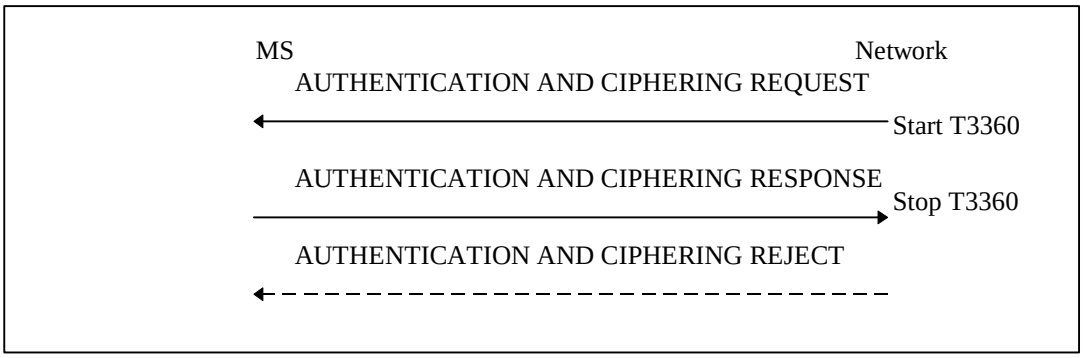

Figure 4.7.7/1 3GPP TS 24.008: Authentication and ciphering procedure

(f) Authentication failure (GMM cause "MAC failure" or "GSM authentication unacceptable")

The MS shall send an AUTHENTICATION & CIPHERING FAILURE message, with GMM cause ‘MAC failure’ or ‘GSM authentication unacceptable’ according to subclause 4.7.7.5.1, to the network and start timer T3318. Furthermore, the MS shall stop any of the retransmission timers that are running (e.g. T3310, T3321, T3330 or T3317). Upon the first receipt of an AUTHENTICATION & CIPHERING FAILURE message from the MS with GMM cause ‘MAC failure’ or ‘GSM authentication unacceptable’ the network may initiate the identification procedure described in subclause 4.7.8. This is to allow the network to obtain the IMSI from the MS. The network may then check that the P-TMSI originally used in the authentication challenge corresponded to the correct IMSI. Upon receipt of the IDENTITY REQUEST message from the network, the MS shall send the IDENTITY RESPONSE message.

NOTE: Upon receipt of an AUTHENTICATION & CIPHERING FAILURE message from the MS with reject cause "MAC failure" or "GSM authentication unacceptable", the network may also terminate the authentication procedure (see subclause 4.7.7.5).

If the P-TMSI/IMSI mapping in the network was incorrect, the network should respond by sending a new AUTHENTICATION & CIPHERING REQUEST message to the MS. Upon receiving the new AUTHENTICATION & CIPHERING REQUEST message from the network, the MS shall stop timer T3318, if running, and then process the challenge information as normal.

If the network is validated successfully (an AUTHENTICATION & CIPHERING REQUEST message that contains a valid SQN and MAC is received), the MS shall send the AUTHENTICATION & CIPHERING RESPONSE message to the network and shall start any retransmission timers (e.g. T3310, T3321, T3330 or T3317), if they were running and stopped when the MS received the first failed AUTHENTICATION AND CIPHERING REQUEST message.

If the MS receives the second AUTHENTICATION AND CIPHERING REQUEST while T3318 is running and

- the MAC value cannot be resolved; or
- the message was received in UMTS and contains a GSM authentication challenge,

the MS shall follow the procedure specified in this subclause (f), starting again from the beginning. If the SQN is invalid, the MS shall proceed as specified in (g).

It can be assumed that the source of the authentication challenge is not genuine (authentication not accepted by the MS) if any of the following occurs:

- after sending the AUTHENTICATION & CIPHERING FAILURE message with GMM cause ‘MAC failure’ or ‘GSM authentication unacceptable’ the timer T3318 expires;
- the MS detects any combination of the authentication failures: "MAC failure", "invalid SQN", and "GSM authentication unacceptable", during three consecutive authentication challenges. The authentication challenges shall be considered as consecutive only, if the authentication challenges causing the second and

third authentication failure are received by the MS, while the timer T3318 or T3320 started after the previous authentication failure is running.

When it has been deemed by the MS that the source of the authentication challenge is not genuine (authentication not accepted by the MS), the MS shall behave as described in subclause 4.7.7.6.1.

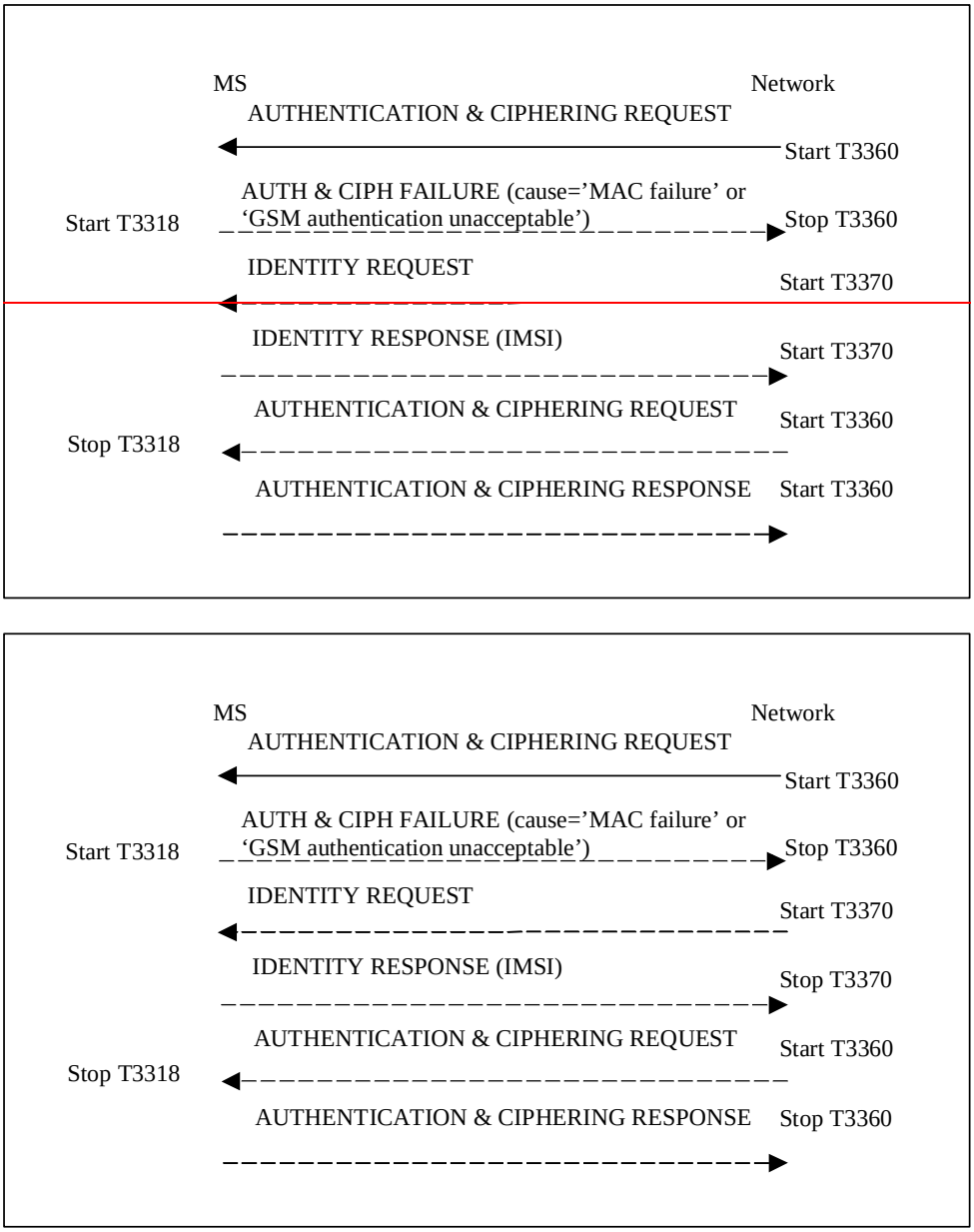

Figure 4.7.7a/1 3GPP TS 24.008: Authentication failure cause "MAC failure" or "GSM authentication unacceptable"

3GPP TSG-CN1 Meeting #32 **Tdoc N1-031525**
Bangkok, Thailand, 27 – 31 October 2003

CR-Form-v7

CHANGE REQUEST

⌘ **24.008** **CR** **826** ⌘ **rev** **-** ⌘ Current version: **6.2.0** ⌘

*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:	⌘	Removal of codepoint for acknowledged GTP
Source:	⌘	Siemens AG
Work item code:	⌘	TEI6
Date:	⌘	16/10/2003
Category:	⌘	**F**
Release:	⌘	Rel-6

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	Acknowledged GTP was removed from GPRS in R99 (see TS 03.60/23.060 and TS 09.60/29.060), because in practise it was not needed and not implemented. Only in TS 24.008 the codepoint for a reliability class involving acknowledged GTP was kept. To align with the other specifications, it is proposed to set the codepoint to 'unused' for sending protocol entities.
Summary of change:	⌘	The codepoint for "Acknowledged GTP; LLC and RLC, Protected data" is set to 'unused' for sending protocol entities. If received, it shall be interpreted as a request for "Unacknowledged GTP; Acknowledged LLC and RLC, Protected data".
Consequences if not approved:	⌘	Misalignment between specifications. TS 24.008 pretends to offer a certain service, since the definition of the QoS IE allows to ask for it, but actually the service cannot be provided, because it was removed from the other parts of the standard.

Clauses affected:	⌘	10.5.6.5

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

⌘

Other comments:	⌘	

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

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 minimum length of 14 octets and a maximum length of 16 octets. The QoS requested by the MS shall be encoded both in the QoS attributes specified in octets 3-5 and in the QoS attributes specified in octets 6-14.

In the MS to network direction and in the network to MS direction the following applies:

- Octets 15 and 16 are optional. If octet 15 is included, then octet 16 shall also be included.

  A QoS IE received without octets 6-16, without octets 14-16, or without octets 15-16 shall be accepted by the receiving entity.

NOTE: This behavior is required for interworking with entities supporting an earlier version of the protocol, or when the Maximum bit rate for downlink is negotiated to a value lower than 8700 kbps.

The *quality of service* information element is coded as shown in figure 10.5.138/3GPP TS 24.008 and table 10.5.156/3GPP TS 24.008.

8	7	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			Delivery order			Delivery of erroneous SDU		Octet 6
Maximum SDU size								Octet 7
Maximum bit rate for uplink								Octet 8
Maximum bit rate for downlink								Octet 9
Residual BER				SDU error ratio				Octet 10
Transfer delay							Traffic Handling priority	Octet 11
Guaranteed bit rate for uplink								Octet 12
Guaranteed bit rate for downlink								Octet 13
0 0 0 spare			Signal-ling Indicat-ion	Source Statistics Descriptor				Octet 14
Maximum bit rate for downlink (extended)								Octet 15
Guaranteed bit rate for downlink (extended)								Octet 16

Figure 10.5.138/3GPP TS 24.008: *Quality of service* information element

Table 10.5.156/3GPP TS 24.008: *Quality of service* information element

Reliability class, octet 3 (see 3GPP TS 23.107)
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 Unused. If received, it shall be interpreted as '010' ~~Acknowledged GTP, LLC, and RLC; Protected data~~(note)
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.

NOTE: this value was allocated in earlier versions of the protocol.

Delay class, octet 3 (see 3GPP TS 22.060 and 3GPP TS 23.107)
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 3GPP TS 23.107)
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 3GPP 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 3GPP 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 3GPP 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

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 3GPP 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

Traffic class, octet 6 (see 3GPP 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.

Maximum SDU size, octet 7 (see 3GPP TS 23.107)
In MS to network direction:
0 0 0 0 0 0 0 0 Subscribed maximum SDU size
1 1 1 1 1 1 1 1 Reserved
In network to MS direction:
0 0 0 0 0 0 0 0 Reserved
1 1 1 1 1 1 1 1 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:
1 0 0 1 0 1 1 1 1502 octets
1 0 0 1 1 0 0 0 1510 octets
1 0 0 1 1 0 0 1 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 bit rate for uplink, octet 8
Bits
8 7 6 5 4 3 2 1
In MS to network direction:
0 0 0 0 0 0 0 0 Subscribed maximum bit rate for uplink
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:
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 568 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 0kbps

Maximum bit rate for downlink, octet 9 (see 3GPP TS 23.107)

Coding is identical to that of Maximum bit rate for uplink.

If the sending entity wants to indicate a Maximum bit rate for downlink higher than 8640 kbps, it shall set octet 9 to ”11111110”, i.e. 8640 kbps, and shall encode the value for the Maximum bit rate in octet 15.

In this version of the protocol, for messages specified in the present document, the sending entity shall not request 0 kbps for both the Maximum bitrate for downlink and the Maximum bitrate for uplink at the same time. Any entity receiving a request for 0 kbps in both the Maximum bitrate for downlink and the Maximum bitrate for uplink shall consider that as a syntactical error (see clause 8).

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

The MS shall consider all other values as reserved.

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

The MS shall consider all other values as reserved.

Traffic handling priority, octet 11 (see 3GPP 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 (See 3GPP TS 23.107)
Bits
8 7 6 5 4 3

In MS to network direction:
0 0 0 0 0 0 Subscribed transfer delay
In network to MS direction:
0 0 0 0 0 0 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 4000 ms in 100ms increments

1 1 1 1 1 1 Reserved

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

Guaranteed bit rate for uplink, octet 12 (See 3GPP TS 23.107)

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, or Maximum bit rate for uplink is set to 0 kbps.

Guaranteed bit rate for downlink, octet 13(See 3GPP TS 23.107)

Coding is identical to that of Maximum bit rate for uplink.

If the sending entity wants to indicate a Guaranteed bit rate for downlink higher than 8640 kbps, it shall set octet 13 to ”11111110”, i.e. 8640 kbps, and shall encode the value for the Guaranteed bit rate in octet 16.

The Guaranteed bit rate for downlink value is ignored if the Traffic Class is Interactive class or Background class, or Maximum bit rate for downlink is set to 0 kbps.

Source Statistics Descriptor, octet 14 (see 3GPP TS 23.107)
Bits
4 3 2 1
In MS to network direction
0 0 0 0 unknown
0 0 0 1 speech

The network shall consider all other values as unknown.

In network to MS direction
Bits 4 to 1 of octet 14 are spare and shall be coded all 0.

Signalling Indication, octet 14 (see 3GPP TS 23.107)
Bit
5
In MS to network direction and in network to MS direction:
0 Not optimised for signalling traffic

1 Optimised for signalling traffic

If set to '1' the QoS of the PDP context is optimised for signalling

Bits 8 to 6 of octet 14 are spare and shall be coded all 0.

Maximum bit rate for downlink (extended), octet 15
Bits
8 7 6 5 4 3 2 1
In MS to network direction and in network to MS direction:
0 0 0 0 0 0 0 0 Use the value indicated by the Maximum bit rate for downlink in octet 9.

0 0 0 0 0 0 0 1 Ignore the value indicated by the Maximum bit rate for downlink in octet 9. The maximum bit rate is
0 1 0 0 1 0 1 0 8600 kbps + ((the binary coded value in 8 bits) * 100 kbps), giving a range of values from 8700 kbps to 16000 kbps in 100 kbps increments.

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.

Guaranteed bit rate for downlink (extended), octet 16
Bits
8 7 6 5 4 3 2 1
In MS to network direction and in network to MS direction:
0 0 0 0 0 0 0 0 Use the value indicated by the Guaranteed bit rate for downlink in octet 13.

0 0 0 0 0 0 0 1 Ignore the value indicated by the Guaranteed bit rate for downlink in octet 13. The maximum bit rate is
0 1 0 0 1 0 1 0 8600 kbps + ((the binary coded value in 8 bits) * 100 kbps), giving a range of values from 8700 kbps to 16000 kbps in 100 kbps increments.

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.

3GPP TSG-CN1 Meeting #32 **Tdoc N1-031529**
Bangkok, Thailand, 27 – 31 October 2003

CR-Form-v7

CHANGE REQUEST

⌘ **24.008** **CR** **827** ⌘ **rev** **-** ⌘ Current version: **6.2.0** ⌘

*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 [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	SSD and Signalling indication in QoS IE
Source:	⌘	Nokia
Work item code:	⌘	TEI6
Date:	⌘	21/10/2003
Category:	⌘	**F**
Release:	⌘	Rel-6

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	Currently 24.008 defines the relevancy of QoS attributes for each bearer traffic class (e.g. transfer delay, traffic handling priority and guaranteed bit rate). However when Source Statistics Descriptor and Signalling Indication attributes were introduced, similar restrictions were not specified. In order to avoid possible misinterpretation and to be in line with 23.107, it is proposed to clearly state the traffic classes which these two attributes are not valid for.
Summary of change:	⌘	- Typo in THP (octect 11) corrected. - SSD (octect 13), statement that the attribute shall be ignored if traffic class is either interactive or background. - Signalling Indication (octect 14), statement that the attribute shall be ignored if traffic class is either conversational, streaming or background.
Consequences if not approved:	⌘	Possible misinterpretation and misalignment with the rest of attributes in 24.008 and 23.107.

Clauses affected:	⌘	10.5.6.5			
Other specs affected:	⌘	**Y**	**N**		
			X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

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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.

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 minimum length of 14 octets and a maximum length of 16 octets. The QoS requested by the MS shall be encoded both in the QoS attributes specified in octets 3-5 and in the QoS attributes specified in octets 6-14.

In the MS to network direction and in the network to MS direction the following applies:

- Octets 15 and 16 are optional. If octet 15 is included, then octet 16 shall also be included.

  A QoS IE received without octets 6-16, without octets 14-16, or without octets 15-16 shall be accepted by the receiving entity.

NOTE: This behavior is required for interworking with entities supporting an earlier version of the protocol, or when the Maximum bit rate for downlink is negotiated to a value lower than 8700 kbps.

The *quality of service* information element is coded as shown in figure 10.5.138/3GPP TS 24.008 and table 10.5.156/3GPP TS 24.008.

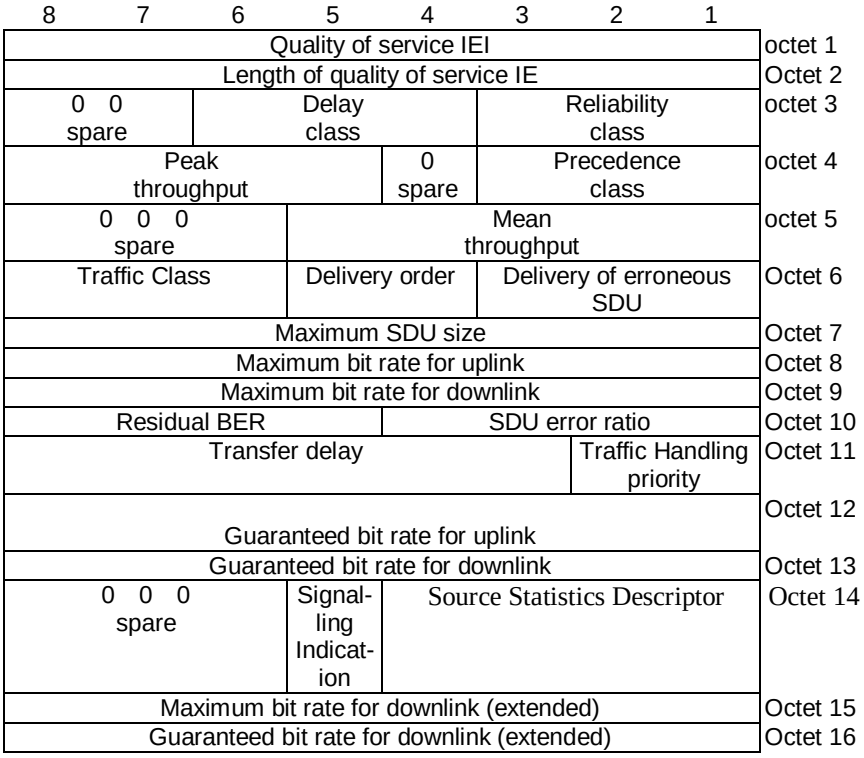

Figure 10.5.138/3GPP TS 24.008: *Quality of service* information element

Table 10.5.156/3GPP TS 24.008: *Quality of service* information element

Reliability class, octet 3 (see 3GPP TS 23.107)
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 3GPP TS 22.060 and 3GPP TS 23.107)
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 3GPP TS 23.107)
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 3GPP 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 3GPP 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 3GPP 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

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 3GPP 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

Traffic class, octet 6 (see 3GPP 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.

Maximum SDU size, octet 7 (see 3GPP TS 23.107)
In MS to network direction:
0 0 0 0 0 0 0 0 Subscribed maximum SDU size
1 1 1 1 1 1 1 1 Reserved
In network to MS direction:
0 0 0 0 0 0 0 0 Reserved
1 1 1 1 1 1 1 1 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:
1 0 0 1 0 1 1 0 1502 octets
1 0 0 1 1 0 0 0 1510 octets
1 0 0 1 1 0 0 1 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 bit rate for uplink, octet 8
Bits
8 7 6 5 4 3 2 1
In MS to network direction:
0 0 0 0 0 0 0 0 Subscribed maximum bit rate for uplink
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:
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 568 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 0kbps

Maximum bit rate for downlink, octet 9 (see 3GPP TS 23.107)

Coding is identical to that of Maximum bit rate for uplink.

If the sending entity wants to indicate a Maximum bit rate for downlink higher than 8640 kbps, it shall set octet 9 to ”11111110”, i.e. 8640 kbps, and shall encode the value for the Maximum bit rate in octet 15.

In this version of the protocol, for messages specified in the present document, the sending entity shall not request 0 kbps for both the Maximum bitrate for downlink and the Maximum bitrate for uplink at the same time. Any entity receiving a request for 0 kbps in both the Maximum bitrate for downlink and the Maximum bitrate for uplink shall consider that as a syntactical error (see clause 8).

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

The MS shall consider all other values as reserved.

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

The MS shall consider all other values as reserved.

Traffic handling priority, octet 11 (see 3GPP 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 Conversational class, Streaming class or Background class.

Transfer delay, octet 11 (See 3GPP TS 23.107)
Bits
8 7 6 5 4 3

In MS to network direction:
0 0 0 0 0 0 Subscribed transfer delay
In network to MS direction:
0 0 0 0 0 0 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 4000 ms in 100ms increments

1 1 1 1 1 1 Reserved

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

Guaranteed bit rate for uplink, octet 12 (See 3GPP TS 23.107)

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, or Maximum bit rate for uplink is set to 0 kbps.

Guaranteed bit rate for downlink, octet 13(See 3GPP TS 23.107)

Coding is identical to that of Maximum bit rate for uplink.

If the sending entity wants to indicate a Guaranteed bit rate for downlink higher than 8640 kbps, it shall set octet 13 to ”11111110”, i.e. 8640 kbps, and shall encode the value for the Guaranteed bit rate in octet 16.

The Guaranteed bit rate for downlink value is ignored if the Traffic Class is Interactive class or Background class, or Maximum bit rate for downlink is set to 0 kbps.

Source Statistics Descriptor, octet 14 (see 3GPP TS 23.107)
Bits
4 3 2 1
In MS to network direction
0 0 0 0 unknown
0 0 0 1 speech

The network shall consider all other values as unknown.

In network to MS direction
Bits 4 to 1 of octet 14 are spare and shall be coded all 0.

The Source Statistics Descriptor value is ignored if the Traffic Class is Interactive class or Background class.

Signalling Indication, octet 14 (see 3GPP TS 23.107)
Bit
5

In MS to network direction and in network to MS direction:
0 Not optimised for signalling traffic
1 Optimised for signalling traffic

If set to '1' the QoS of the PDP context is optimised for signalling

Bits 8 to 6 of octet 14 are spare and shall be coded all 0.

The Signalling Indication value is ignored if the Traffic Class is Conversational class, Streaming class or Background class.

Maximum bit rate for downlink (extended), octet 15
Bits
8 7 6 5 4 3 2 1
In MS to network direction and in network to MS direction:
0 0 0 0 0 0 0 0 Use the value indicated by the Maximum bit rate for downlink in octet 9.

0 0 0 0 0 0 0 1 Ignore the value indicated by the Maximum bit rate for downlink in octet 9. The maximum bit rate is
0 1 0 0 1 0 1 0 8600 kbps + ((the binary coded value in 8 bits) * 100 kbps), giving a range of values from 8700 kbps to 16000 kbps in 100 kbps increments.

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.

Guaranteed bit rate for downlink (extended), octet 16
Bits
8 7 6 5 4 3 2 1
In MS to network direction and in network to MS direction:
0 0 0 0 0 0 0 0 Use the value indicated by the Guaranteed bit rate for downlink in octet 13.

0 0 0 0 0 0 0 1 Ignore the value indicated by the Guaranteed bit rate for downlink in octet 13. The maximum bit rate is
0 1 0 0 1 0 1 0 8600 kbps + ((the binary coded value in 8 bits) * 100 kbps), giving a range of values from 8700 kbps to 16000 kbps in 100 kbps increments.

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.