3GPP   Document **NP-99127**

Technical Specification Group Core Networks

Meeting #3, Yokohama, 21-23 April 1999

Source: **SMG 3 WPA/ 3GPP_TSG_CN_WG1**

Title: **Agreed CRs on ASCI, CCBS, CTS, EDGE, GPRS and NITZ**

Document for: Decision

Attention: Agenda item

CN is invited to endorse these CRs to be passed to SMG#29 for approval.

CN1/SMG3 Plenary Meeting　　　　　　　　　　**Tdoc Nxxxx XXX**

XX, Japan

26- April, 1999

Source : SMG 3 WPA/ 3GPP_TSG_CN_WG1

Title :

Agreed CRs on ASCI, CCBS, CTS, EDGE, GPRS and NITZ

Proposed Agenda Item :

Presented for :　　　　　　Approval

Introduction :

WI	SPEC	CR	PH	REV	VERS	SUBJECT	CAT	NEW_VER	STC_DOC
ASCI	04.69	A007	R96	2	5.2.0	Coding of Call Reference IE	F	5.3.0	N1-99168
ASCI	04.68	A009	R96	2	5.2.0	Coding of Call Reference IE	F	5.3.0	N1-99167
CCBS	04.08	A507	R97	1	6.3.0	Clarification to CCBS T334 timer	F	6.4.0	N1-99164
CTS	04.56	A001	R98		7.0.0	Inclusion of parameters in the Attachment Accept Procedure	F	7.1.0	N1-99078
CTS	04.56	A002	R98		7.0.0	clarification to the reattach procedure	F	7.1.0	N1-99169
EDGE	04.08	A371	R99	2	6.1.1	BCIE modifications due to EDGE	B	8.0.0	N1-99178
GPRS	04.08	A505	R97		6.3.0	'GPRS services not allowed' cause in the ATTACH REJECT (combined case).	F	6.4.0	N1-99034
GPRS	09.10	A009	R97		6.0.1	GPRS Attach Reject Cause when 'IMSI unknown'	F	6.1.0	N1-99035
GPRS	09.18	A024	R97	1	6.3.0	Clarification of the null RA and other corrections	F	6.4.0	N1-99176
GPRS	04.08	A467	R97	2	6.3.0	Multiple ATTACH REQUEST attempts and GMM-common procedures: abnormal cases on the network side	F	6.4.0	N1-99184
GPRS	04.08	A503	R97	1	6.3.0	Network Initiated Detach with ReAttach	F	6.4.0	N1-99182
GPRS	04.64	A051	R97	1	6.3.0	GSM 04.64 CR A051r1 Signalling SAPI Information Field Length	F	6.4.0	N1-99141
GPRS	04.64	A055	R97	1	6.3.0	Discarding outstanding LL-DATA-REQ in the case of LLC re-establishment	F	6.4.0	N1-99172
NITZ	04.08	A621	R99	2	6.3.0	IE Daylight Saving Time	B	8.0.0	N1-99199

CHANGE REQUEST No :	A507 rev1	*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

Technical Specification GSM / UMTS:	04.08	Version	6.3.0

Submitted to SMG	#29	for approval	X	without presentation ("non-strategic")	
list plenary meeting or STC here ↑		for information		with presentation ("strategic")	

PT SMG CR cover form. Filename: crf26_3.doc

Proposed change affects: SIM [ ] ME [ ] Network [X]
(at least one should be marked with an X)

Work item: CCBS

Source: Alcatel   **Date:** 990315

Subject: Clarification to CCBS T334 timer

Category:

(one category and one release only shall be Marked with an X)

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

Reason for change:

In GSM 03.93 it is stated that when sending the RECALL message:
- if the subscriber is idle, the network shall start the CCBS recall timer T4 guarding the receipt of the SETUP message from the mobile.
- If the subscriber has another call in progress, the network shall start the CCBS notification timer T10 guarding the receipt of the SETUP message from the mobile.

After expiry of T4 or T10, the treatment in the network is different. The values of T4 and T10 may be different.

However, in GSM 04.08, the same timer T334 is used the subscriber having or not another call in progress.
Besides, in the table 11.4 (section 11.3), the values of the timers are either given or indicated as set by the operator. So it is not clear that T334 can take 2 different values according to the subscriber has a call in progress or not.
Therefore, this CR adds a note to table 11.4 in order to clarify the use of T334.

Clauses affected: 11.3

Other specs Affected:

Other releases of same spec		→ List of CRs:	
Other core specifications		→ List of CRs:	
MS test specifications / TBRs		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

help.doc

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

11.3 Timers of circuit-switched call control

Table 11.4/GSM 04.08: Call control timers - network side

TIM. NUM.	DFT TIM VAL	STATE OF CALL	CAUSE FOR START	NORMAL STOP	AT FIRST EXPIRY	AT SECON EXPIRY
T301	Min 180s Note 1	Call received	ALERT received	CONN received	Clear the call	Timer is not restarted
T303	Note 2	Call present	SETUP sent	CALL CONF or REL COMP received	Clear the call	Timer is not restarted
T305	30s	Disconnect Indication without progress indic. #8 sent or CCBS Possible	DISC	REL or DISC received	Network sends RELEASE	Timer is not restarted
T306	30s	Disconnect Indication with progress indic. #8 sent but no CCBS possible	DISC	REL or DISC received	Stop the tone/ announc. Send REL	Timer is not restarted
T308	Note 2	Release request	REL sent	REL COMP or REL received	Retrans. RELEASE restart T308	Release call reference
T310	Note 2	Incoming call pro-ceeding	CALL CONF received	ALERT, CONN or DISC received	Clear the call	Timer is not restarted
T313	Note 2	Connect Indication	CON sent	CON ACK received	Clear the call	Timer is not restarted
T323	30s	Modify request	MOD sent	MOD COMP or MOD REJ received	Clear the call	Timer is not restarted
T331	Note 2	CC Connec. Pending	CM-SERV PROMPT sent	START CC received	Clear the call	Timer is not restarted
T333	Note 2	CC-Est. Present	START CC received	CC-EST.CONF or REL COMP received	Clear the call	Timer is not restarted
T334	Min 15s Note 3	CC-Est. Confirmed	RECALL sent	SETUP received	Clear the call	Timer is not restarted
T338	Note 2	Disconnect indication with CCBS possible	DISC	REL or DISC received	stop any tone/ announc. Send REL	Timer is not restarted

NOTE 1: The network may already have applied an internal alerting supervision function; e.g. incorporated within call control. If such a function is known to be operating on the call, then timer T301 is not used.

NOTE 2: These time values are set by the network operator.

NOTE 3: When applied to the supplementary service CCBS, the timer T334 can either represent the recall timer T4 or the notification timer T10 (see GSM 03.93). Thus the timer T334 can take two different values. GSM 03.93 defines the range of these values.

CHANGE REQUEST No :   **A009 rev.2**   .

Technical Specification GSM :   GSM 04.68   Version   5.2.0

Submitted to SMG   #29   for approval   **X**   without presentation ("non-strategic")
list plenary meeting or STC here ↑   for information   **X**   with presentation ("strategic")   **X**

PT SMG CR cover form. Filename: crf26_3.doc

Proposed change affects: SIM ☐   ME **X**   Network **X**
(at least one should be marked with an X)

Work item: ASCI

Source: SIEMENS AG   **Date:**   23.03.1999

Subject: Coding of Call Reference IE

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

Reason for change:

The Call Reference IE is defined as a type 3 information element used information in the Group Call Control (GCC) protocol messages. According to the current definition of the Call Reference IE the IE could be extended by a so called continuation flag. As a type 3 IE has fix length it isn't possible to define a extension mechanism for such IEs.

This CR proposes to delete the extension mechanism.

Clauses affected: 9.4.1

Other specs affected:	Other releases of same spec		→ List of CRs:	
	Other core specifications		→ List of CRs:	
	MS test specifications / TBRs		→ List of CRs:	
	BSS test specifications		→ List of CRs:	
	O&M specifications		→ List of CRs:	

Other comments:

9.4.1 Call Reference

The *Call Reference* information element identifies the group call reference or group Id of a group call. It is coded as shown below. It is a type 3 information element.

<call reference> ::= **reference** *{* **0 spare_4~~3~~** / **1 {** **priority** spare_1 **} }** *{* **0** *<continuation>* **/ 1 }**

<continuation> ::= **0 spare_7** *<continuation>* / **1 spare_7**

Attributes

The information element defines a reference which, depending on the situation, is to be interpreted as a group call reference or as a group id. If the **priority** field is present in *<call reference>*, the information element also specifies a priority.

Field contents

The field of the *call ~~state~~reference* information element are coded as shown in table 9.2.

Table 9.2: *call reference* information element

<div>

reference (27 bits)

This field contains the 27 bit binary encoding (with leading zeroes) of the number the decimal encoding of which (with leading zeroes) is the group call reference or the group id (see GSM 03.03).

priority (3 bits)

This field encodes the priority level of the call (see GSM 03.67):

Bits	
0 0 0	reserved
0 0 1	priority level 4
0 1 0	priority level 3
0 1 1	priority level 2
1 0 0	priority level 1
1 0 1	priority level 0
1 1 0	priority level B
1 1 1	priority level A

spare_4~~3~~ (4~~3~~ bits)
                        This field shall be ignored
spare_1~~7~~ (1~~7~~ bits)
                        This field shall be ignored

</div>

Sophia Antipolis, France
22-25 March, 1999

CHANGE REQUEST No :	**A007 rev. 2**

Technical Specification GSM / UMTS: GSM 04.69   Version   5.2.0

Submitted to SMG #29	for approval	**X**	without presentation ("non-strategic")	
list plenary meeting or STC here ↑	for information		with presentation ("strategic")	**X**

PT SMG CR cover form. Filename: crf26_3.doc

Proposed change affects: SIM ☐   ME **X**   Network **X**
(at least one should be marked with an X)

Work item: ASCI

Source: SIEMENS AG   **Date:**   23.03.1999

Subject: Coding of Call Reference IE

Category:

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

(one category and one release only shall be marked with an X)

Reason for change:

The Call Reference IE is defined as a type 3 information element used information in the Broadcast Call Control (BCC) protocol messages. According to the current definition of the Call Reference IE the IE could be extended by a so called continuation flag. As a type 3 IE has fix length it isn't possible to define a extension mechanism for such IEs.

This CR proposes to delete the extension mechanism.

Clauses affected: 9.4.1

Other specs affected:

Other releases of same spec		→ List of CRs:	
Other core specifications		→ List of CRs:	
MS test specifications / TBRs		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

9.4.1 Call Reference

The *Call Reference* information element identifies the broadcast call reference or broadcast Id of a broadcast call. It is coded as shown below. It is a type 3 information element.

<call reference> ::= **reference** *{* **0 spare_43** */* **{ 1 priority** spare_1 **} }** *{ 0 <continuation> / 1 }*

<continuation> ::= **0 spare_7 <continuation> / 1 spare_7**

Attributes

The information element defines a reference which, depending on the situation, is to be interpreted as a broadcast call reference or as a broadcast id. If the **priority** field is present in *<call reference>*, the information element also specifies a priority.

Field contents

The field of the *call statereference* information element are coded as shown in table 9.2.

Table 9.2: *call reference* information element

reference (27 bits)   This field contains the 27 bit binary encoding (with leading zeroes) of the number the decimal encoding of which (with leading zeroes) is the broadcast call reference or the broadcast id (see GSM 03.03).

priority (3 bits)
    3 2 1
    0 0 0   reserved
    0 0 1   call priority level 4
    0 1 0   call priority level 3
    0 1 1   call priority level 2
    1 0 0   call priority level 1
    1 0 1   call priority level 0
    1 1 0   call priority level B
    1 1 1   call priority level A

spare_43 (43 bits)   This field shall be ignored
spare_17 (17 bits)   This field shall be ignored

CHANGE REQUEST No :	**A001**	*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

Technical Specification GSM/UMTS 04.56 Version 7.0.0

Submitted to SMG #29   for approval **X**   without presentation ("non-strategic") **X**

list plenary meeting or STC here ↑   for information   with presentation ("strategic")

PT SMG CR cover form. Filename: crf26_2.doc

Proposed change affects: SIM ☐   ME **X**   Network ☐   **Workitem:** CTS

(at least one should be marked with an X)

Source:	Alcatel	**Date:**	

Subject: Clarification to the enrolment procedure

Category:

(one category and one release shall be marked with an X)

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

Reason for change: The MS behaviour on reception of a CTS ENROLMENT REJECT was missing. The timer TC3254 shall be stopped.

Clauses affected: 5.3.1.3 (new) + 5.3.1.4

Other specs affected:

(One or more may be marked with an X)

Other releases of same spec	☐	→ List of CRs:
Other core specifications	☐	→ List of CRs:
MS test specifications / TBRs	☐	→ List of CRs:
BSS test specifications	☐	→ List of CRs:
O&M specifications	☐	→ List of CRs:

Other comments:

help.doc

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

5.3 CTS-MM specific procedures

5.3.1 CTS enrolment procedure

The purpose of the CTS enrolment procedure is:

- to define an association between a certain CTS-MS and a certain CTS-FP,
- to ensure the rights of the CTS-MS to use CTS services on this CTS-FP.

The CTS enrolment procedure is always initiated by the mobile station.

The user shall provide the CTS-PIN (see 03.20 Annex E) on the mobile station and shall take a physical action on the CTS-FP.

5.3.1.1 CTS enrolment initiation by the mobile station

The mobile station initiates the CTS enrolment procedure by sending a CTS ENROLMENT REQUEST message to the CTS-FP. The mobile station shall start the timer TC3254.

5.3.1.2 CTS enrolment completion by the fixed part

After mutual authentication, the fixed part shall request the mobile station identity to perform the verification of its rights to use CTS services on this fixed part. This verification is done either locally by the fixed part or by the CTS operator via the Cf interface (see GSM 03.20 Annex E). Upon these rights are verified, the CTS-FP shall enrol the CTS-MS and shall send a CTS ENROLMENT ACCEPT to the mobile station. The CTS ENROLMENT ACCEPT contains the identity of the fixed part (IFPSI or IFPEI), and the first CTSMSI value of the mobile station.

5.3.1.3 CTS enrolment completion by the mobile station

On reception of a CTS ENROLMENT ACCEPT, the CTS-MS shall stop the timer TC3254 and enters in CTS MM IDLE state.

5.3.1.4~~3~~ Unsuccessful enrolment

If the mobile station has not the rights to be enrolled, the fixed part shall send a CTS ENROLMENT REJECT message to the mobile station. This message contains a reject cause and the identity of the fixed part.

On reception of a CTS ENROLMENT REJECT, the CTS-MS shall stop the timer TC3254 and enters in ENROLMENT REJECTED state.

5.3.1.5~~4~~ Abnormal cases

(a) CTS-RR connection failure

If the CTS-RR connection is lost before the CTS ENROLMENT ACCEPT message is received, the enrolment procedure has failed. A new enrolment attempt may be done by the user.

(b) No response from the fixed part (expiry of timer TC3254)

The mobile station should warn the mobile station user. A new enrolment attempt may be done by the user.

CHANGE REQUEST No :	**A002 rev1**	*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

Technical Specification GSM/UMTS 04.56 Version 7.0.0

Submitted to SMG #29
list plenary meeting or STC here ↑

for approval **X**
for information

without presentation ("non-strategic") **X**
with presentation ("strategic")

PT SMG CR cover form. Filename: crf26_2.doc

Proposed change affects: SIM ☐ ME **X** Network ☐ **Workitem:** CTS
(at least one should be marked with an X)

Source: Alcatel **Date:**

Subject: Clarification to the Re-attach procedure

Category:

(one category and one release shall be marked with an X)

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

Reason for change: The Re-attach/Attach procedures need simplification and editorial modification.

Clauses affected: 5.3.3 + 9.2 + 9.2.1 + 9.2.2 + 9.2.5 + 9.2.6 + 10.5.3.11 (new)

Other specs affected:

(One or more may be marked with an X)

Other releases of same spec		→ List of CRs:
Other core specifications		→ List of CRs:
MS test specifications / TBRs		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:
- Deletion of CTS Reattach Request/Accept messages
- Addition of an information indicating the attachment type in the CTS attach Request
- Transfer of IE follow on proceed from CTS attach request to CTS attach accept

help.doc

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

5.3.3   CTS re-attach procedure

The purpose of the CTS re-attach procedure is to inform the presence of a mobile station to the fixed part on which it is attached.

The CTS re-attach procedure is always started by the mobile station.

This procedure is started at expiry of the timer TC3252.

5.3.3.1   CTS re-attach initiation by the mobile station

The mobile station initiates the CTS re-attach procedure by sending a CTS RE-ATTACH REQUEST message with an indication of re-attachment to the CTS-FP and starts the timer TC3255.

5.3.3.2   CTS re-attach completion by the fixed part

On reception of a CTS RE-ATTACH REQUEST message with an indication of re-attachment, the fixed part shall respond with a CTS RE-ATTACH ACCEPT and shall start again the CTS periodic attach update procedure (see 5.3.4).

5.3.3.3   Abnormal cases

(a) RR connection failure:

Upon a detection of a RR connection failure before the CTS RE-ATTACH ACCEPT is received, the mobile station shall consider to be detached from the fixed part.

(b) RR not available:

If no radio resource is currently available on the fixed part (STATUS field set to busy in the BCH-SB), the timer TC3252 shall be started again with its initial value.

(c) Expiry of timer TC3255

The mobile station shall be considered to be detached of the corresponding fixed part.

9.2 Messages for mobility management

Table 9.2.1/GSM 04.56 summarises the messages for mobility management.

Table 9.2.1/GSM 04.56: Messages for mobility management

Attach/detach messages:	Reference
CTS ATTACH REQUEST	9.2.1
CTS ATTACH ACCEPT	9.2.2
CTS ATTACH REJECT	9.2.3
CTS DETACH INDICATION	9.2.4
~~CTS RE-ATTACH REQUEST~~	~~9.2.5~~
~~CTS RE-ATTACH ACCEPT~~	~~9.2.6~~
Enrolment messages:	**Reference**
CTS ENROLMENT REQUEST	9.2.7
CTS ENROLMENT ACCEPT	9.2.8
CTS ENROLMENT REJECT	9.2.9
CTS DE-ENROLMENT INDICATION	9.2.10
Authentication messages:	**Reference**
CTS MS AUTHENTICATION REQUEST	9.2.11
CTS MS AUTHENTICATION RESPONSE	9.2.12
CTS FP AUTHENTICATION RESPONSE	9.2.13
CTS MS AUTHENTICATION REJECT	9.2.14
Identity messages:	**Reference**
CTSMSI UPDATE COMMAND	9.2.15
CTSMSI UPDATE COMPLETE	9.2.16

9.2.1 CTS attach request

This message is sent by the mobile station to the fixed part to indicate to request attachment on this fixed part. See table 9.2.2/GSM 04.56.

Message type: CTS ATTACH REQUEST
Significance: dual
Direction: mobile station to fixed part

Table 9.2.2/GSM 04.56: CTS ATTACH REQUEST message content

IEI	Information element	Type / Reference	Presence	Format	Length
	CTS mobility management protocol discriminator	Protocol discriminator 10.2	M	V	½
	Sub-Protocol Discriminator	Sub-Protocol Discriminator 10.3.1	M	V	½
	CTS attach request message type	Message type 10.4	M	V	1
	CTS Ciphering Key Sequence Number	Ciphering Key Sequence Number GSM 04.08 10.5.1.2	M	V	1/2
	Attach type	Attach type 10.5.3.11	M	V	½
	Mobile Station Classmark	Mobile Station Classmark 1 GSM 04.08 10.5.1.5	M	V	1
	Mobile identity	Mobile identity 10.5.1.1	M	LV	2-9
~~A1~~	~~Follow on proceed~~	~~Follow on proceed GSM 04.08 10.5.3.7~~	~~O~~	~~T~~	~~1~~

9.2.2 CTS attach accept

This message is sent by the fixed part to the mobile station to indicate that the requested attachment has been accepted. See table 9.2.3/GSM 04.56

Message type: CTS ATTACH ACCEPT
Significance: dual
Direction: fixed part to mobile station

ETSI

Table 9.2.3/GSM 04.56: CTS ATTACH ACCEPT message content

IEI	Information element	Type / Reference	Presence	Format	Length
	CTS mobility management protocol discriminator	Protocol discriminator 10.2	M	V	½
	Sub-Protocol Discriminator	Sub-Protocol Discriminator 10.3.1	M	V	½
	CTS attach accept message type	Message type 10.4	M	V	1
	TC3252	TC3252 10.5.3.10	M	V	1
01	CTS mobile group list	CTS mobile group list 10.5.3.7	O	TLV	5-26
02	Access right identity	Access right identity 10.5.3.9	O	TV	4
A1	Follow on proceed	Follow on proceed GSM 04.08 10.5.3.7	O	T	1

9.2.3   CTS attach reject

This message is sent by the fixed part to the mobile station to indicate that the requested attachment has been rejected. See table 9.2.4/GSM 04.56.

Message type: CTS ATTACH REJECT
Significance: dual
Direction: fixed part to mobile station

Table 9.2.4/GSM 04.56: CTS ATTACH REJECT message content

IEI	Information element	Type / Reference	Presence	Format	Length
	CTS mobility management protocol discriminator	Protocol discriminator 10.2	M	V	½
	Sub-Protocol Discriminator	Sub-Protocol Discriminator 10.3.1	M	V	½
	CTS attach reject message type	Message type 10.4	M	V	1
	Fixed part identity	Fixed part identity 10.5.3.6	M	LV	2-10
	Reject cause	Reject cause GSM 04.08 10.5.3.6	M	V	1

9.2.4   CTS detachment indication

This message is sent by the mobile station to the fixed part to indicate the detachment of this fixed part. See table 9.2.5/GSM 04.56.

Message type: CTS DETACH INDICATION
Significance: dual
Direction: mobile station to fixed part

Table 9.2.5/GSM 04.56: CTS DETACH INDICATION message content

IEI	Information element	Type / Reference	Presence	Format	Length
	CTS mobility management protocol discriminator	Protocol discriminator 10.2	M	V	½
	Sub-Protocol Discriminator	Sub-Protocol Discriminator 10.3.1	M	V	½
	CTS detach indication message type	Message type 10.4	M	V	1
	Mobile Station Classmark	Mobile Station Classmark 1 GSM 04.08 10.5.1.5	M	V	1
	Mobile identity	Mobile identity 10.5.1.1	M	LV	2-9

9.2.5   CTS re-attach request

This message is sent by the mobile station to the fixed part to indicate its presence to this fixed part. See table 9.2.6/GSM 04.56.

ETSI

Message type: CTS RE-ATTACH REQUEST
Significance: dual
Direction: mobile station to fixed part

Table 9.2.6/GSM 04.56: CTS RE-ATTACH REQUEST message content

IEI	Information element	Type / Reference	Presence	Format	Length
	CTS mobility management protocol discriminator	Protocol discriminator 10.2	M	V	½
	Sub-Protocol Discriminator	Sub-Protocol Discriminator 10.3.1	M	V	½
	CTS re-attach request message type	Message type 10.4	M	V	1
	Mobile Station Classmark	Mobile Station Classmark 1 GSM 04.08 10.5.1.5	M	V	1
	Mobile identity	Mobile identity 10.5.1.1	M	LV	2-9

9.2.6   CTS re-attach accept

This message is sent by the fixed part to the mobile station to indicate that the attachment to the fixed has been updated. See table 9.2.7/GSM 04.56

Message type: CTS RE-ATTACH ACCEPT
Significance: dual
Direction: fixed part to mobile station

Table 9.2.7/GSM 04.56: CTS RE-ATTACH ACCEPT message content

IEI	Information element	Type / Reference	Presence	Format	Length
	CTS mobility management protocol discriminator	Protocol discriminator 10.2	M	V	½
	Sub-Protocol Discriminator	Sub-Protocol Discriminator 10.3.1	M	V	½
	CTS re-attach accept message type	Message type 10.4	M	V	1

ETSI

10.5.3.10   TC3252

The purpose of the *TC3252* information element is to provide the value of the timer TC3252.
The *TC3252* information element is coded as shown in figure 10.21/GSM 04.5656 and table
10.21/GSM 04.56.
The *TC3252* is a type 3 information element with 2 octets length.

```
 8     7     6     5     4     3     2     1
+-----------------------------------------------+
|                TC3252    IEI                  | octet 1
+-----------------------------------------------+
|                TC3252 value                   | octet 2
+-----------------------------------------------+
```
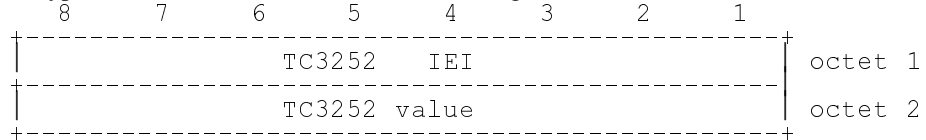
Figure 10.21/GSM 04.56 *TC3252* information element

Table 10.21GSM 04.56: *TC3252* information element

```
+-------------------------------------------------------------+
| TC3252 value                                                |
| It is the value in deciminutes (6 seconds) of the           |
| timer TC3252.                                               |
+-------------------------------------------------------------+
```
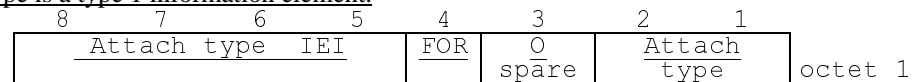
10.5.3.11   Attach type

The purpose of the Attach type information element is to indicate whether a normal attach or a reattach
is wanted. It may also indicate that a follow-on request has been received from the mobile station CM
layer.
The Attach type information element is coded as shown in figure 10.22/GSM 04.56 and table
10.22/GSM 04.56.
The Attach type is a type 1 information element.

```
 8     7     6     5     4     3     2     1
+-----------------------------+-----+-----+-----------+
|     Attach type  IEI        | FOR |  O  |  Attach   | octet 1
|                             |     |spare|   type    |
+-----------------------------+-----+-----+-----------+
```

Figure 10.22/GSM 04.56 Attach type information element

```
+---------------------------------------------------------+
| FOR (octet 1):                                          |
| Bit 4                                                   |
| 0       No Follow On Request pending                    |
| 1                Follow On Request pending              |
|                                                         |
| Attach type (octet 2)                                   |
| Bits                                                    |
| 2 1                                                     |
| 0 0    Normal attach procedure                          |
| 0 1    Re-attach procedure                              |
| 1 0    Reserved                                         |
| 1 1    Reserved                                         |
+---------------------------------------------------------+
```

Table 10.22GSM 04.56: Attach type information element

ETSI

CHANGE REQUEST No : **A371r2~1~**

Technical Specification GSM / UMTS: 04.08   Version   6.1.1

Submitted to SMG   3   for approval   **X**   without presentation ("non-strategic")   **X**
                                for information   with presentation ("strategic")

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

Work item: EDGE

Source: Nokia   **Date:** 16.03.99

Subject: BCIE modifications due to EDGE

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

Reason for change: Modification of parameters due to EDGE

Clauses affected:
- 9.3.2 Call Confirmed, 9.3.3 Call Proceeding, 9.3.13 Modify, 9.3.14 Modify complete, 9.3.15 Modify reject, 9.3.17b CC-Establishment confirmed, 9.2.23 Setup

- 10.5.4.5 Bearer capability, Figure 10.71/GSM 04.08 Bearer capability information element, Table 10.80/GSM 04.08: Bearer capability information element (new)

- 10.5.4.5.1 Static conditions for the bearer capability IE contents

Other specs affected: Other releases of same spec   [ ]   → List of CRs:
                            Other core specifications   [ ]   → List of CRs:
                            MS test specifications / TBRs [ ]   → List of CRs:
                            BSS test specifications   [ ]   → List of CRs:
                            O&M specifications   [ ]   → List of CRs:

Other comments:

7E	User-user	User-user 10.5.4.25	O	TLV	3-35
7F	SS version	SS version indicator 10.5.4.24	O	TLV	2-3

9.3.1.2.1   Facility

This information element may be used for functional operation of supplementary services.

9.3.1.2.2   User-user

This information element may be included when the called mobile station wants to return information to the calling remote user.

9.3.1.2.3   SS version

This information element shall not be included if the *facility* information element is not present in this message.

This information element shall be included or excluded as defined in GSM 04.10. This information element should not be transmitted unless explicitly required by GSM 04.10.

9.3.2   Call confirmed

This message is sent by the called mobile station to confirm an incoming call request.

See table 9.56/GSM 04.08.

Message type: CALL CONFIRMED
Significance: local
Direction: mobile station to network

Table 9.56/GSM 04.08: CALL CONFIRMED message content

IEI	Information element Length	Type / Reference	Presence	Format	
	Call control protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2
	Call confirmed message type	Message type 10.4	M	V	1
D-	Repeat Indicator	Repeat Indicator 10.5.4.22	C	TV	1
04	Bearer capability 1	Bearer capability 10.5.4.5	O	TLV	3-156
04	Bearer capability 2	Bearer capability 10.5.4.5	O	TLV	3-156
08	Cause	Cause 10.5.4.11	O	TLV	4-32
15	CC Capabilities	Call Control Capabilities 10.5.4.5a	O	TLV	3

9.3.2.1   Repeat indicator

The *repeat indicator* information element shall be included if *bearer capability 1* information element and *bearer capability 2* IE are both included in the message.

9.3.2.2   Bearer capability 1 and bearer capability 2

The *bearer capability 1* information element shall be included if and only if at least one of the following five cases holds:

- the mobile station wishes another bearer capability than that given by the *bearer capability 1* information element of the incoming SETUP message;
- the *bearer capability 1* information element is missing or not fully specified in the SETUP message;
- the *bearer capability 1* information element received in the SETUP message is accepted and the "radio channel requirement" of the mobile station is other than "full rate support only mobile station";
- the *bearer capability 1* information element received in the SETUP message indicates speech and is accepted and the mobile station supports other speech versions than GSM version 1;
- the *bearer capability 1* information element received in the SETUP message included the "fixed network user rate" parameter.

When the *bearer capability 1* information element is followed by the *bearer capability 2* IE in the SETUP, the above rules apply to both *bearer capability* 1 IE and bearer capability 2 IE. Except those cases identified in GSM 07.01, if either *bearer capability* needs to be included, both shall be included.

Furthermore, both *bearer capability* information elements may be present if the mobile station wishes to reverse the order of occurrence of the *bearer capability* information elements (which is referred to in the *repeat indicator* information element, see section 10.5.4.22) in cases identified in GSM 07.01.

9.3.2.3   Cause

This information element is included if the mobile station is compatible but the user is busy.

9.3.2.4   CC Capabilities

This information element may be included by the mobile station to indicate its call control capabilities.

9.3.3   Call proceeding

This message is sent by the network to the calling mobile station to indicate that the requested call establishment information has been received, and no more call establishment information will be accepted.

See table 9.57/GSM 04.08.

Message type: CALL PROCEEDING
Significance: local
Direction: network to mobile station

Table 9.57/GSM 04.08: CALL PROCEEDING message content

IEI	Information element Length	Type / Reference	Presence	Format	
	Call control protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2
	Call proceeding message type	Message type 10.4	M	V	1
D-	Repeat Indicator	Repeat Indicator 10.5.4.22	C	TV	1
04	Bearer capability 1	Bearer capability 10.5.4.5	O	TLV	3-156
04	Bearer capability 2	Bearer capability 10.5.4.5	O	TLV	3-156
1C	Facility	Facility 10.5.4.15	O	TLV	2-?
1E	Progress indicator	Progress indicator 10.5.4.21	O	TLV	4

| 8- | Priority granted | Priority Level 10.5.1.11 | O | TV | 1 |

9.3.3.1   Repeat indicator

This information element is included if and only if *bearer capability 1* IE and *bearer capability 2 IE* are both contained in the message.

9.3.3.2   Bearer capability 1 and bearer capability 2

The *bearer capability 1* information element is included if the network has to specify at least one of the negotiable parameters described in GSM 07.01, or if the *bearer capability 1* information element received in the SETUP message included the "fixed network user rate" parameter.

When the *bearer capability 1* information element is followed by the *bearer capability 2* IE in the SETUP, the above rule applies to both *bearer capability* 1 IE and *bearer capability 2* IE. Except those cases identified in GSM 07.01, if either *bearer capability* needs to be included, both shall be included.

9.3.3.3   Facility

This information element may be used for functional operation of supplementary services.

9.3.3.4   Progress Indicator

This information element may be included:

-        in order to pass information about the call in progress e.g. in the event of interworking; and/or
-        to make the MS attach the user connection for speech.

9.3.3.5   Priority granted

The priority field is provided by the network in the case that eMLPP is used and the priority assigned by the network is not the same as that requested by the mobile station.

9.3.4   Congestion control

This message is sent by the mobile station or the network to indicate the establishment or termination of flow control on the transmission of USER INFORMATION messages.

See table 9.58/GSM 04.08.

Message type: CONGESTION CONTROL
Significance: local (note)
Direction: both

Table 9.58/GSM 04.08: CONGESTION CONTROL message content

IEI	Information element Length	Type / Reference	Presence	Format	
	Call control protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2
	Congestion control message type	Message type 10.4	M	V	1

This information element may be included by the network to inform the MS about further possible reactions.

9.3.7.2   Disconnect (mobile station to network direction)

This message is sent by the mobile station to request the network to clear an end-to-end connection.

See table 9.61a/GSM 04.08.

Message type: DISCONNECT
Significance: global
Direction: mobile station to network

Table 9.61a/GSM 04.08: DISCONNECT message content (mobile station to network direction)

IEI	Information element Length	Type / Reference	Presence	Format	
	Call control protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2
	Disconnect message type	Message type 10.4	M	V	1
	Cause	Cause 10.5.4.11	M	LV	3-31
1C	Facility	Facility 10.5.4.15	O	TLV	2-?
7E	User-user	User-user 10.5.4.25	O	TLV	3-35
7F	SS version	SS version indicator 10.5.4.24	O	TLV	2-3

9.3.7.2.1   Facility

This information element may be used for functional operation of supplementary services, such as the user-user service.

9.3.7.2.2   User-user

This information element is included when the mobile station initiates call clearing and wants to pass user information to the remote user at call clearing time.

9.3.7.2.3   SS version

This information element shall not be included if the *facility* information element is not present in this message.

This information element shall be included or excluded as defined in GSM 04.10. This information element should not be transmitted unless explicitly required by GSM 04.10.

9.3.8   Emergency setup

This message is sent from the mobile station to initiate emergency call establishment.

See table 9.62/GSM 04.08.

Message type: EMERGENCY SETUP
Significance: global
Direction: mobile station to network

Table 9.62/GSM 04.08: EMERGENCY SETUP message content

IEI	Information element Length	Type / Reference	Presence	Format	
	Call control protocol discriminator	Protocol discriminator 10.2	M	V	1/2

	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2
	Emergency setup message type	Message type 10.4	M	V	1
04	Bearer capability	Bearer capability 10.5.4.5	O	TLV	3-9

9.3.8.1 Bearer capability

If the element is not included, the network shall by default assume speech and select full rate speech version 1. If this information element is included, it shall indicate speech, the appropriate speech version(s) and have the appropriate value of radio channel requirement field.

9.3.9 Facility

9.3.9.1 Facility (network to mobile station direction)

This message is sent by the network to the mobile station to request or acknowledge a supplementary service. The supplementary service to be invoked and its associated parameters are specified in the facility information element.

See table 9.62a/GSM 04.08.

Message type: FACILITY
Significance: local (NOTE 1)
Direction: network to mobile station

Table 9.62a/GSM 04.08: FACILITY message content (network to mobile station direction)

IEI	Information element Length	Type / Reference	Presence	Format	
	Call control protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2
	Facility message type	Message type 10.4	M	V	1
	Facility (note 2)	Facility 10.5.4.15	M	LV	1-?

> NOTE 1:   This message has local significance; however, it may carry information of global significance.

> NOTE 2:   The *facility* information element has no upper length limit except that given by the maximum number of octets in a L3 message, see GSM 04.06.

9.3.9.2 Facility (mobile station to network direction)

This message is sent by the mobile station to the network to request or acknowledge a supplementary service. The supplementary service to be invoked and its associated parameters are specified in the facility information element.

See table 9.62b/GSM 04.08.

Message type: FACILITY
Significance: local (note 1)
Direction: mobile station to network

Table 9.62d/GSM 04.08: HOLD ACKNOWLEDGE message content

IEI	Information element Length	Type / Reference	Presence	Format	
	Call control protocol discriminator	Protocol discriminator 10.2	M	V	1/2

| | Transaction identifier | Transaction identifier 10.3.2 | M | V | 1/2 |
| | Hold Acknowledge message type | Message type 10.4 | M | V | 1 |

9.3.12   Hold Reject

This message is sent by the network to indicate the denial of a request to hold a call.

See table 9.62e/GSM 04.08 for the content of the HOLD REJECT message.

For the use of this message, see GSM 04.10.

Message type: HOLD REJECT
Significance: local
Direction: network to mobile station

Table 9.62e/GSM 04.08: HOLD REJECT message content

IEI	Information element Length	Type / Reference	Presence	Format	
	Call control protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2
	Hold Reject message type	Message type 10.4	M	V	1
	Cause	10.5.4.11	M	LV	3-31

9.3.13   Modify

This message is sent by the mobile station to the network or by the network to the mobile station to request a change in bearer capability for a call.

See table 9.63/GSM 04.08.

Message type: MODIFY
Significance: global
Direction: both

Table 9.63/GSM 04.08: MODIFY message content

IEI	Information element Length	Type / Reference	Presence	Format	
	Call control protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2
	Modify message type	Message type 10.4	M	V	1
	Bearer capability	Bearer capability 10.5.4.5	M	LV	2-14~~5~~
7C	Low layer comp.	Low layer comp. 10.5.4.18	O	TLV	2-15
7D	High layer comp.	High layer comp. 10.5.4.16	O	TLV	2-5
A3	Reverse call setup direction	Reverse call setup direction 10.5.4.22a	O	T	1

9.3.13.1   Low layer compatibility

This information element shall be included if it was included in the initial SETUP message.

9.3.13.2   High layer compatibility

This information element shall be included if it was included in the initial SETUP message.

9.3.13.3   Reverse call setup direction

This information element is included or omitted in the mobile to network direction according to the rules defined in section 5.3.4.3.1.

9.3.14   Modify complete

This message is sent by the mobile station to the network or by the network to the mobile station to indicate completion of a request to change bearer capability for a call.

See table 9.64/GSM 04.08.

Message type: MODIFY COMPLETE
Significance: global
Direction: both

Table 9.64/GSM 04.08: MODIFY COMPLETE message content

IEI	Information element Length	Type / Reference	Presence	Format	
	Call control protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2
	Modify complete message type	Message type 10.4	M	V	1
	Bearer capability	Bearer capability 10.5.4.5	M	LV	2-14~~5~~
7C	Low layer comp.	Low layer comp. 10.5.4.18	O	TLV	2-15
7D	High layer comp.	High layer comp. 10.5.4.16	O	TLV	2-5
A3	Reverse call setup direction	Reverse call setup direction 10.5.4.22a	O	T	1

9.3.14.1   Low layer compatibility

This information element shall be included if it was included in the initial SETUP message.

9.3.14.2   High layer compatibility

This information element shall be included if it was included in the initial SETUP message.

9.3.14.3   Reverse call setup direction

This information element is included or omitted according to the rules defined in section 5.3.4.3.2.

9.3.15   Modify reject

This message is sent by the mobile station to the network or by the network to the mobile station to indicate failure of a request to change the bearer capability for a call.

See table 9.65/GSM 04.08.

Message type: MODIFY REJECT
Significance: global
Direction: both

Table 9.65/GSM 04.08: MODIFY REJECT message content

IEI	Information element Length	Type / Reference	Presence	Format	
	Call control protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2
	Modify reject message type	Message type 10.4	M	V	1
	Bearer capability	Bearer capability 10.5.4.5	M	LV	2-145
	Cause	Cause 10.5.4.11	M	LV	3-31
7C	Low layer comp.	Low layer comp. 10.5.4.18	O	TLV	2-15
7D	High layer comp.	High layer comp. 10.5.4.16	O	TLV	2-5

9.3.15.1   Low layer compatibility

This information element shall be included if it was included in the initial SETUP message.

9.3.15.2   High layer compatibility

This information element shall be included if it was included in the initial SETUP message.

9.3.16   Notify

This message is sent either from the mobile station or from the network to indicate information pertaining to a call, such as user suspended.

See table 9.66/GSM 04.08.

Message type: NOTIFY
Significance: access
Direction: both

Table 9.66/GSM 04.08: NOTIFY message content

IEI	Information element Length	Type / Reference	Presence	Format	
	Call control protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2
	Notify message type	Message type 10.4	M	V	1
	Notification indicator	Notification indicator 10.5.4.20	M	V	1

*   From the 4th IE onwards the message is coded in the same way as the SETUP message in MS to network direction from the 4th IE onwards.

9.3.17a.2   Setup container

This information element contains the contents of a SETUP message (Mobile Station to Network).

9.3.17b   CC-Establishment confirmed $(CCBS)$

A Network that does not support the "Network initiated MO call" option shall treat this message as a message with message type not defined for the PD.

This message is sent by the mobile station to the network to indicate the requested channel characteristics for the call which may be initiated by the mobile station .

See Table 9.67b/GSM 04.08.

Message type: CC-ESTABLISHMENT CONFIRMED
Significance: local
Direction: mobile station to network

TABLE 9.67b/GSM 04.08: CC-ESTABLISHMENT CONFIRMED message content

IEI	Information element Length	Type / Reference	Presence	Format	
	Call control protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2
	CC-Establishment confirmed message type	Message type 10.4	M	V	1
D-	Repeat Indicator	Repeat Indicator 10.5.4.22	C	TV	1
04	Bearer capability 1	Bearer capability 10.5.4.5	M	TLV	3-10
04	Bearer capability 2	Bearer capability 10.5.4.5	O	TLV	3-10
08	Cause	Cause 10.5.4.11	O	TLV	4-32

9.3.17b.1   Repeat indicator

The *repeat indicator* information element shall be included if *bearer capability 1* information element and *bearer capability 2* IE are both included in the message.

9.3.17b.2   Bearer capability 1 and bearer capability 2

If, in any subsequent SETUP message to be sent on this transaction the *bearer capability 1* information element is to be followed by the *bearer capability 2* IE, then the *bearer capability 2* IE shall be included in this message.

9.3.17b.9   Cause

This information element is included if the mobile station is compatible but the user is busy.

9.3.22   Retrieve Reject

This message is sent by the network to indicate the inability to perform the requested retrieve function.

See table 9.69d/GSM 04.08 for the content of the RETRIEVE REJECT message.

For the use of this message, see GSM 04.10.

Message type: RETRIEVE REJECT
Significance: local
Direction: network to mobile station

Table 9.69d/GSM 04.08: RETRIEVE REJECT message content

IEI	Information element Length	Type / Reference	Presence	Format	
	Call control protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2
	Retrieve Reject message type	Message type 10.4	M	V	1
	Cause	10.5.4.11	M	LV	3-31

9.3.23   Setup

9.3.23.1   Setup (mobile terminated call establishment)

This message is sent by the network to the mobile station to initiate a mobile terminated call establishment.

See table 9.70/GSM 04.08.

Message type: SETUP
Significance: global
Direction: network to mobile station

Table 9.70/GSM 04.08: SETUP message content (network to mobile station direction)

IEI	Information element Length	Type / Reference	Presence	Format	
	Call control protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2
	Setup message type	Message type 10.4	M	V	1
D-	BC repeat indicator	Repeat indicator 10.5.4.22	C	TV	1
04	Bearer capability 1	Bearer capability 10.5.4.5	O	TLV	3-156
04	Bearer capability 2	Bearer capability 10.5.4.5	O	TLV	3-156
1C	Facility	Facility 10.5.4.15	O	TLV	2-?
1E	Progress indicator	Progress indicator 10.5.4.21	O	TLV	4
34	Signal	Signal 10.5.4.23	O	TV	2
5C	Calling party BCD number	Calling party BCD num. 10.5.4.9	O	TLV	3-14
5D	Calling party sub-address	Calling party subaddr. 10.5.4.10	O	TLV	2-23

(continued...)

Table 9.70/GSM 04.08 (continued): SETUP message content
(network to mobile station direction)

5E	Called party BCD number	Called party BCD num. 10.5.4.7	O	TLV	3-13
6D	Called party sub-address	Called party subaddr. 10.5.4.8	O	TLV	2-23
D-	LLC repeat indicator	Repeat indicator 10.5.4.22	O	TV	1
7C	Low layer compatibility I	Low layer comp. 10.5.4.18	O	TLV	2-15
7C	Low layer compatibility II	Low layer comp. 10.5.4.18	C	TLV	2-15
D-	HLC repeat indicator	Repeat indicator 10.5.4.22	O	TV	1
7D	High layer compatibility i	High layer comp. 10.5.4.16	O	TLV	2-5
7D	High layer compatibility ii	High layer comp. 10.5.4.16	C	TLV	2-5
7E	User-user	User-user 10.5.4.25	O	TLV	3-35
8-	Priority	Priority Level 10.5.1.11	O	TV	1
19	Alert	Alerting Pattern 10.5.4.26	O	TLV	3

9.3.23.1.1   BC repeat indicator

The *BC repeat indicator* information element is included if and only if *bearer capability* 1 information element and *bearer capability 2* IE are both present in the message.

9.3.23.1.2   Bearer capability 1 and bearer capability 2

The *bearer capability 1* information element may be omitted in the case where the mobile subscriber is allocated only one directory number for all services (ref.: GSM 09.07). The *bearer capability 2* IE is missing at least if the *bearer capability 1* IE is missing.

9.3.23.1.3   Facility

This information element may be included for functional operation of supplementary services.

9.3.23.1.4   Progress indicator

This information element is included by the network

-       in order to pass information about the call in progress e.g. in the event of interworking and/or
-       to make the MS attach the user connection for speech.

9.3.23.1.5   Called party subaddress

Included in the Network-to-mobile station direction if the calling user includes a *called party subaddress* information element in the SETUP message.

9.3.23.1.6   LLC repeat indicator

The *LLC repeat indicator* information element is included if and only if both following conditions hold:

-       The *BC repeat indicator* IE is contained in the message.
-       The *low layer compatibility I* IE is contained in the message.

If included, the *LLC repeat indicator* shall specify the same repeat indication as the *BC repeat indicator* IE.

9.3.23.1.7   Low layer compatibility I

Included in the network-to-mobile station direction if the calling user specified a low layer compatibility.

9.3.23.1.8   Low layer compatibility II

Included if and only if the *LLC repeat indicator* information element is contained in the message.

9.3.23.1.9   HLC repeat indicator

The *HLC repeat indicator* information element is included if and only both following conditions hold:

- The *BC repeat indicator* IE is contained in the message.
- The *high layer compatibility i* IE is contained in the message.
If included, the *HLC repeat indicator* shall specify the same repeat indication as the *BC repeat indicator* IE.

9.3.23.1.10   High layer compatibility i

Included in the network-to-mobile station direction if the calling user specified a high layer compatibility.

9.3.23.1.11   High layer compatibility ii

Included if and only if the *HLC repeat indicator* information element is contained in the message.

9.3.23.1.12   User-user

May be included in the network to called mobile station direction when the calling remote user included a user-user information element in the SETUP message.

9.3.23.1.13   Priority

May be included by the network to indicate the priority of the incoming call if eMLPP is used.

9.3.23.1.14   Alert $(Network Indication of Alerting in the MS)$

May be included by the network to give some indication about alerting (category or level). If supported in the MS, this optional indication is to be used by the MS as specified in GSM 02.07.

9.3.23.2   Setup (mobile originating call establishment)

This message is sent from the mobile station to the network to initiate a mobile originating call establishment.

See table 9.70a/GSM 04.08.

Message type: SETUP
Significance: global
Direction: mobile station to network

Table 9.70a/GSM 04.08: SETUP message content (mobile station to network direction)

IEI	Information element Length	Type / Reference	Presence	Format	
	Call control protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2
	Setup message type	Message type 10.4	M	V	1

D-	BC repeat indicator	Repeat indicator 10.5.4.22	C	TV	1
04	Bearer capability 1	Bearer capability 10.5.4.5	M	TLV	3-156
04	Bearer capability 2	Bearer capability 10.5.4.5	O	TLV	3-156
1C	Facility (simple recall alignment)	Facility 10.5.4.15	O	TLV	2-
5D	Calling party sub-address	Calling party subaddr. 10.5.4.10	O	TLV	2-23
5E	Called party BCD number	Called party BCD num. 10.5.4.7	M	TLV	3-43
6D	Called party sub-address	Called party subaddr. 10.5.4.8	O	TLV	2-23
D-	LLC repeat indicator	Repeat indicator 10.5.4.22	O	TV	1
7C	Low layer compatibility I	Low layer comp. 10.5.4.18	O	TLV	2-15
7C	Low layer compatibility II	Low layer comp. 10.5.4.18	O	TLV	2-15
D-	HLC repeat indicator	Repeat indicator 10.5.4.22	O	TV	1
7D	High layer compatibility i	High layer comp. 10.5.4.16	O	TLV	2-5
7D	High layer compatibility ii	High layer comp. 10.5.4.16	O	TLV	2-5
7E	User-user	User-user 10.5.4.25	O	TLV	3-35
7F	SS version	SS version indicator 10.5.4.24	O	TLV	2-3
A1	CLIR suppression	CLIR suppression 10.5.4.11a	C	T	1
A2	CLIR invocation	CLIR invocation 10.5.4.11b	C	T	1
15	CC capabilities	Call Control Capabilities 10.5.4.5a	O	TLV	3
1D	Facility $(CCBS)$ (advanced recall alignment)	Facility 10.5.4.15	O	TLV	2-?
1B	Facility (recall alignment Not essential) $(CCBS)$	Facility 10.5.4.15	O	TLV	2-?

9.3.23.2.1   BC repeat indicator

The *BC repeat indicator* information element is included if and only if *bearer capability 1* IE and *bearer capability 2* IE are both present in the message.

9.3.23.2.2   Facility

The information element may be included for functional operation of supplementary services.

Three different codings of this IE exist, for further details see 04.10.

9.3.23.2.3   LLC repeat indicator

The *LLC repeat indicator* information element is included if and only if both following conditions hold:

-       The *BC repeat indicator* IE is contained in the message.
-       The *low layer compatibility I* IE is contained in the message.

If included, the *LLC repeat indicator* shall specify the same repeat indication as the *BC repeat indicator* IE.

9.3.23.2.4 Low layer compatibility I

The information element is included in the MS-to-network direction when the calling MS wants to pass low layer compatibility information to the called user.

9.3.23.2.5 Low layer compatibility II

Included if and only if the *LLC repeat indicator* information element is contained in the message.

9.3.23.2.6 HLC repeat indicator

The *HLC repeat indicator* information element is included if and only if both following conditions hold:

- The *BC repeat indicator* IE is contained in the message.
- The *high layer compatibility i* IE is contained in the message.
If included, the *HLC repeat indicator* shall specify the same repeat indication as the *BC repeat indicator* IE.

9.3.23.2.7 High layer compatibility i

The information element is included when the calling MS wants to pass high layer compatibility information to the called user.

9.3.23.2.8 High layer compatibility ii

Included if and only if the *HLC repeat indicator* information element is contained in the message.

9.3.23.2.9 User-user

The information element is included in the calling mobile station to network direction when the calling mobile station wants to pass user information to the called remote user.

9.3.23.2.10 SS version

This information element shall not be included if the *facility* information element is not present in this message.

This information element shall be included or excluded as defined in GSM 04.10. This information element should not be transmitted unless explicitly required by GSM 04.10.

9.3.23.2.11 CLIR suppression

The information element may be included by the MS (see GSM 04.81). If this information element is included the *CLIR invocation* IE shall not be included.

9.3.23.2.12 CLIR invocation

The information element may be included by the MS (see GSM 04.81). If this information element is included the *CLIR suppression* IE shall not be included.

9.3.23.2.13 CC Capabilities

This information element may be included by the mobile station to indicate its call control capabilities.

10.5.4.5   Bearer capability

The purpose of the bearer capability information element is to describe a bearer service. The use of the bearer capability information element in relation to compatibility checking is described in annex B.

The bearer capability information element is coded as shown in figure 10.71/GSM 04.08 and tables 10.72/GSM 04.08 to 10.79/GSM 04.08.

The bearer capability is a type 4 information element with a minimum length of 3 octets and a maximum length of 156 octets.

```
        8      7      6      5      4      3      2      1
     +-----------------------------------------------------+
     |      |           Bearer capability IEI             | octet 1
     +-----------------------------------------------------+
     |                                                     |
     |     Length of the bearer capability contents        | octet 2
     +-----------------------------------------------------+
     | 0/1 |   radio    | co-  |trans|   information        |
     | ext |  channel   |ding  | fer |    transfer          | octet 3
     |     |requirement | std  |mode |   capability         |
     +-----+----+-------+------+---------------------------+
     | 0/1 |  0 |  0       0   |                            |
     | ext | co-|    spare     |   speech version          |octet 3a etc*
     |     |ding|              |    indication             |
     +-----+----+----------+-----------+-----+-----+-------+
     |  1  |comp-|            |dupl.|confi| NIRR|esta- |
     | ext |ress.|  structure |mode | gur.|     |bli.  | octet 4*
     +-----+----+-----------+-------+-----+-----------+---+
     | 0/1 |  0      0   |  rate    |   signalling          |
     | ext |access id.  | adaption |  access protocol      | octet 5*
     +-----+-----------+----------+---------------------+--+
     | 0/1 |            |Other rate| 0      0      0        |
     | ext | Other ITC  | adaption |       Spare           | octet 5a*
     +-----+-----------+----------+-----+-----+-----------+-+
     |  1  |Hdr/ |Multi|Mode | LLI |Assig|Inb. |   0       |
     | ext |noHdr|frame|     |     |nor/e|neg  |Spare| octet 5b*
     +-----+-----+-----+-----+-----+-----+-----+-----------+
     | 0/1 |  0      1  |  User information   |sync/|
     | ext |layer 1 id. | layer 1 protocol   |async| octet 6*
     +-----+-----+------+-----+--------------------------+
     | 0/1 |numb.|nego-|numb.|                            |
     | ext |stop |tia- |data |       user rate            | octet 6a*
     |     |bits |tion |bits |                            |
     +-----+-----+-----+-----+--------------------------+
     | 0/1 |  intermed.  | NIC | NIC |                      |
     | ext |    rate     |on TX|on RX|    Parity           | octet 6b*
     +-----+------------+-----+-----+-----------------------+
     | 0/1 |connection  |                                   |
     | ext |  element   |       modem type                 | octet 6c*
     |     |            |                                   |
     +-----+-----------+-------------------------------+
     | 0/1 |   Other    | Fixed network user rate         | octet 6d*
     | ext |modem type  |                                   |
     +-----+-----------+-------------------------------+
     | 0/1 |   Acceptable        |Maximum number of| octet 6e*
     | ext |    channel          |traffic channels  |
     |     |    codings          |                  |
     +-----+----------------------+----------------------+
     | 0/1 |     UIMI            | Wanted air interface  | octet 6f*
     | ext |                     | user rate             |
     +-----+----------------------+----------------------+
     |  1  | Acceptable         | 0      0      0      0 |
     | ext | channel codings    |                        |
     |     |   extended         |         Spare         | octet 6g*
     +-----+----------------------+----------------------+
     |  1  |  1      0   |   User information            |
     | ext |layer 2 id. |   layer 2 protocol            | octet 7*
     +-----------------------------------------------------+
```

Figure 10.71/GSM 04.08
Bearer capability information element

NOTE: The coding of the octets of the bearer capability information element is not
         conforming to TS CCITT Q.931.

Table 10.72/GSM 04.08: Bearer capability information element

Radio channel requirement (octet 3), network to MS direction

Bits 6 and 7 are spare bits. The sending side (i.e. the network) shall set bit 7 to value 0 and bit 6 to value 1.

Radio channel requirement (octet 3) MS to network direction

When information transfer capability (octet 3) indicates other values than speech:
Bits
7 6
0 0   reserved
0 1   full rate support only MS
1 0   dual rate support MS/half rate preferred
1 1   dual rate support MS/full rate preferred

When information transfer capability (octet 3) indicates the value speech and no speech version indication is present in octet 3a etc.:
Bits
7 6
0 0   reserved
0 1   full rate support only MS/fullrate speech version 1 supported
1 0   dual rate support MS/half rate speech version 1 preferred, full rate speech version 1 also supported
1 1   dual rate support MS/full rate speech version 1 preferred, half rate speech version 1 also supported

When information transfer capability (octet 3) indicates the value speech and speech version indication(s) is(are) present in octet 3a etc.:
Bits
7 6
0 0   reserved
0 1   the mobile station supports at least full rate speech version 1 but does not support half rate speech version 1. The complete voice codec preference is specified in octet(s) 3a etc.
1 0   The mobile station supports at least full rate speech version 1 and half rate speech version 1. The mobile station has a greater preference for half rate speech version 1 than for full rate speech version 1. The complete voice codec preference is specified in octet(s) 3a etc.
1 1   The mobile station supports at least full rate speech version 1 and half rate speech version 1. The mobile station has a greater preference for full rate speech version 1 than for half rate speech version 1. The complete voice codec preference is specified in octet(s) 3a etc.

Coding standard (octet 3)
Bit
5
0   GSM standardized coding as described below
1   reserved

(continued...)

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Table 10.72/GSM 04.08: Bearer capability information element (continued)

Transfer mode (octet 3)
Bit
4
0   circuit mode
1   packet mode

Information transfer capability (octet 3)
Bits
3 2 1
0 0 0 speech
0 0 1 unrestricted digital information
0 1 0 3.1 kHz audio, ex PLMN
0 1 1 facsimile group 3
1 0 1 Other ITC (See Octet 5a)
1 1 1 reserved, to be used in the network.
          The meaning is: alternate speech/facsimile group 3 - starting with speech.

All other values are reserved

Table 10.72a/GSM 04.08 Bearer capability information element

Octet(s) 3a etc. MS to network direction

Coding

Bit
7
0   octet used for extension of information transfer capability
1   octet used for other extension of octet 3

When information transfer capability (octet 3) indicates speech and coding (bit 7 in octet 3a etc.) is coded as 0, bits 1 through 6 are coded:

Bits 5 and 6 are spare.

Speech version indication (octet(s) 3a etc.)
Bits
4 3 2 1
0 0 0 0   GSM full rate speech version 1
0 0 1 0   GSM full rate speech version 2
0 0 0 1   GSM half rate speech version 1

All other values have the meaning "speech version tbd" and shall be ignored when received.

If octet 3 is extended with speech version indication(s) (octets 3a etc.), all speech versions supported shall be indicated and be included in order of preference (the first octet (3a) has the highest preference and so on).

If information transfer capability (octet 3) indicates speech and coding (bit 7 in octet 3a etc.) is coded as 1, or the information transfer capability does not indicate speech, then the extension octet shall be ignored.

Octet(s) 3a etc. network to MS direction

The octet(s) 3a etc. shall be ignored by the MS.

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Table 10.73/GSM 04.08: Bearer capability information element

Compression (octet 4), network to MS direction:
Bit
7
0   data compression not possible
1   data compression possible

Compression (octet 4), MS to network direction:
Bit
7
0   data compression not allowed
1   data compression allowed

Structure (octet 4)

Bits
6 5
0 0   service data unit integrity
1 1   unstructured

All other values are reserved.

Duplex mode (octet 4)
Bit
4
0   half duplex
1   full duplex

Configuration (octet 4)
Bit
3
0   point-to-point

All other values are reserved.

NIRR (octet 4)
(Negotiation of Intermediate Rate Requested)
Bit
2
0   No meaning is associated with this value.
1   Data up to and including 4.8 kb/s, full rate, non-transparent, 6 kb/s radio
         interface rate is requested.

Establishment (octet 4)
Bit
1
0   demand

All other values are reserved

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Table 10.74/GSM 04.08: Bearer capability information element

Access identity (octet 5)
Bits
7 6
0 0   octet identifier

All other values are reserved

Rate adaption (octet 5)
Bits
5 4
0 0   no rate adaption
0 1   V.110/X.30 rate adaptation
1 0   CCITT X.31 flag stuffing
1 1   Other rate adaption (see octet 5a)

Signalling access protocol (octet 5)

Bits
3 2 1
0 0 1 I.440/450
0 1 0 X.21
0 1 1 X.28 - dedicated PAD, individual NUI
1 0 0 X.28 - dedicated PAD, universal NUI
1 0 1 X.28 - non dedicated PAD
1 1 0 X.32

All other values are reserved.

Table 10.74a/GSM 04.08: Bearer capability information element

Other ITC (octet 5a)
If the value "Other ITC" is not signalled in the field "ITC" then the contents of this field shall be ignored.

Bit
7 6
0 0   restricted digital information

All other values are reserved

Other rate adaption (octet 5a)
If the value " Other rate adaption" is not signalled in the field "Rate adaption" then the contents of this field shall be ignored.

Bit
5 4
0 0   V.120

All other values are reserved.

Table 10.74b/GSM 04.08: Bearer capability information element

Rate adaption header/no header (octet 5b)

Bit
7
0   Rate adaption header not included
1   Rate adaption header included

Multiple frame establishment support in data link (octet 5b)

Bit
6
0   Multiple frame establishment not supported, only UI frames allowed
1   Multiple frame establishment supported

Mode of operation (octet 5b)

Bit
5
0   Bit transparent mode of operation
1   Protocol sensitive mode of operation

Logical link identifier negotiation (octet 5b)

Bit
4
0   Default, LLI=256 only
1   Full protocol negotiation, (note: A connection over which protocol negotiation will
        be executed is indicated in bit 2 of octet 5b)

Assignor/Assignee (octet 5b)

Bit
3
0   Message originator is "default assignee"
1   Message originator is "assignor only"

In band/Out of band negotiation (octet 5b)

Bit
2
0   Negotiation is done in-band using logical link zero
1   Negotiation is done with USER INFORMATION messages on a temporary
        signalling connection

Bit 1 is spare and set to the value "0"

Table 10.75/GSM 04.08: Bearer capability information element

Layer 1 identity (octet 6)
Bits
7 6
0 1   octet identifier

All other values are reserved

User information layer 1 protocol (octet 6)
Bits
5 4 3 2
0 0 0 0   default layer 1 protocol

All other values reserved.

Synchronous/asynchronous (octet 6)
Bit
1
0   synchronous
1   asynchronous

Table 10.76/GSM 04.08: Bearer capability information element

Number of Stop Bits (octet 6a)
Bit
7
0   1 bit (This value is also used in the case of synchronous mode)
1   2 bits

Negotiation (octet 6a)
Bit
6
0   in-band negotiation not possible

NOTE: See Rec. V.110 and X.30

All other values are reserved

Number of data bits excluding parity bit if present (octet 6a)
Bit
5
0   7 bits
1   8 bits (this value is also used in the case of bit oriented protocols)

User rate (octet 6a)
Bits
4 3 2 1
0 0 0 1   0.3 kbit/s Recommendation X.1 and V.110
0 0 1 0   1.2 kbit/s Recommendation X.1 and V.110
0 0 1 1   2.4 kbit/s Recommendation X.1 and V.110
0 1 0 0   4.8 kbit/s Recommendation X.1 and V.110
0 1 0 1   9.6 kbit/s Recommendation X.1 and V.110
0 1 1 0   12.0 kbit/s transparent (non compliance with X.1 and V.110)
0 1 1 1   1.2 kbit/s/75 bit/s Recommendation V.23, (asymmetric) X.1,V.110.

All other values are reserved.

For facsimile group 3 calls the user rate indicates the first and maximum speed the
mobile station is using.

Table 10.77/GSM 04.08: Bearer capability information element

Octet 6b for V.110/X.30 rate adaptation Intermediate rate (octet 6b)

Bits
7 6
0 0   reserved
0 1   reserved
1 0   8 kbit/s
1 1   16 kbit/s

Network independent clock (NIC) on transmission (Tx) (octet 6b) (See Rec. V.110 and X.30)

Bit
5
0   does not require to send data with network independent clock
1   requires to send data with network independent clock

Network independent clock (NIC) on reception (Rx) (octet 6b) (See Rec. V.110 and X.30)

Bit
4
0   cannot accept data with network independent clock (i.e. sender does not
       support this optional procedure)
1   can accept data with network independent clock (i.e. sender does support this
       optional procedure)

Parity information (octet 6b)
Bits
3 2 1
0 0 0 odd
0 1 0 even
0 1 1 none
1 0 0 forced to 0
1 0 1 forced to 1

All other values are reserved.

Table 10.78/GSM 04.08: Bearer capability information element

```
Connection element (octet 6c)
Bit
7 6
0 0    transparent
0 1    non transparent (RLP)
1 0    both, transparent preferred
1 1    both, non transparent preferred

The requesting end (e.g. the one sending the SETUP message) should use the 4
values depending on its capabilities to support the different modes. The answering
party shall only use the codings 00 or 01, based on its own capabilities and the
proposed choice if any. If both MS and network support both transparent and non
transparent, priority should be given to the MS preference.

Modem type (octet 6c)
Bits
5 4 3 2 1
0 0 0 0 0    none
0 0 0 0 1    V.21
0 0 0 1 0    V.22
0 0 0 1 1    V.22 bis
0 0 1 0 0    V.23
0 0 1 0 1    V.26 ter
0 0 1 1 0    V.32
0 0 1 1 1    modem for undefined interface
0 1 0 0 0    autobauding type 1

All other values are reserved.
```

Table 10.78a/GSM 04.08: Bearer capability information element

```
Other modem type (octet 6d)
Bits
7 6
0 0    no other modem type specified in this field
0 1    V.32bis
1 0    V.34

All other values are reserved.

Fixed network user rate (octet 6d)
Bit
5 4 3 2 1
0 0 0 0 0    Fixed network user rate not applicable/No meaning is associated
             with this value.
0 0 0 0 1    9.6 kbit/s Recommendation X.1 and V.110
0 0 0 1 0    14.4 kbit/s Recommendation X.1 and V.110
0 0 0 1 1    19.2 kbit/s Recommendation X.1 and V.110
0 0 1 0 0    28.8 kbit/s Recommendation X.1 and V.110
0 0 1 0 1    38.4 kbit/s Recommendation X.1 and V.110
0 0 1 1 0    48.0 kbit/s Recommendation X.1 and V.110(synch)
0 0 1 1 1    56.0 kbit/s Recommendation X.1 and V.110(synch) /bit transparent
0 1 0 0 0    64.0 kbit/s bit transparent

All other values are reserved.
```

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Table 10.78b/GSM 04.08: Bearer capability information element

Acceptable channel codings (octet 6e), mobile station to network direction:
Bit
7
0   TCH/F14.4 not acceptable
1   TCH/F14.4 acceptable

Bit
6
0   Spare

Bit
5
0   TCH/F9.6 not acceptable
1   TCH/F9.6 acceptable

Bit
4
0   TCH/F4.8 not acceptable
1   TCH/F4.8 acceptable

Acceptable channel codings (octet 6e), network to MS direction:
Bits 4 to 7 are spare and shall be set to "0".

Maximum number of traffic channels (octet 6e), MS to network direction:
Bits
3 2 1
0 0 0   1 TCH
0 0 1   2 TCH
0 1 0   3 TCH
0 1 1   4 TCH
1 0 0   5 TCH
1 0 1   6 TCH
1 1 0   7 TCH
1 1 1   8 TCH

Maximum number of traffic channels (octet 6e), network to MS direction:
Bits 1 to 3 are spare and shall be set to "0".

Table 10.78c/GSM 04.08: Bearer capability information element

UIMI, User initiated modification indication (octet 6f),

7 6 5
0 0 0 User initiated modification not allowed/required/applicable
0 0 1 User initiated modification up to 1 TCH/F allowed/may be requested
0 1 0 User initiated modification up to 2 TCH/F allowed/may be requested
0 1 1 User initiated modification up to 3 TCH/F allowed/may be requested
1 0 0 User initiated modification up to 4 TCH/F allowed/may be requested

All other values shall be interpreted as "User initiated modification up to 4 TCH/F may be requested".

User initiated modification indication is not applicable for transparent connection.

Wanted air interface user rate (octet 6f), MS to network direction:
Bits
4 3 2 1
0 0 0 0   Air interface user rate not applicable/No meaning associated with this value
0 0 0 1   9.6 kbit/s
0 0 1 0   14.4 kbit/s
0 0 1 1   19.2 kbit/s
0 1 0 1   28.8 kbit/s
0 1 1 0   38.4 kbit/s
0 1 1 1   43.2 kbit/s
1 0 0 0   57.6 kbit/s
1 0 0 1   interpreted by the network as 38.4 kbit/s in this version of the protocol
1 0 1 0   interpreted by the network as 38.4 kbit/s in this version of the protocol
1 0 1 1   interpreted by the network as 38.4 kbit/s in this version of the protocol
1 1 0 0   interpreted by the network as 38.4 kbit/s in this version of the protocol

All other values are reserved.

Wanted air interface user rate (octet 6f), network to MS direction:
Bits 1 to 4 are spare and shall be set to "0".

Table 10.79/GSM 04.08: Bearer capability information element

Layer 2 identity (octet 7)
Bits
7 6
1 0   octet identifier

All other values are reserved

User information layer 2 protocol (octet 7)

Bits
5 4 3 2 1
0 0 1 1 0   recommendation X.25, link level
0 1 0 0 0   ISO 6429, codeset 0 (DC1/DC3)
0 1 0 0 1   reserved: was allocated but never used in earlier phases of the protocol
0 1 0 1 0   videotex profile 1
0 1 1 0 0   COPnoFlCt (Character oriented Protocol with no Flow Control
              mechanism)
0 1 1 0 1   X.75 layer 2 modified (CAPI)

All other values are reserved.

Table 10.80/GSM 04.08: Bearer capability information element

Acceptable Channel Codings extended (octet 6g) mobile station to network direction:
Bit
7
0 TCH/F28.8 not acceptable
1 TCH/F28.8 acceptable

Bit
6
0 TCH/F32.0 not acceptable
1 TCH/F32.0 acceptable

Bit
5
0 TCH/F43.2 not acceptable
1 TCH/F43.2 acceptable

EDGE Channel Codings (octet 6g), network to MS direction:
Bits 5 to 7 are spare and shall be set to "0".

Bits 4, 3, 2 and 1 are spare.

10.5.4.5.1   Static conditions for the bearer capability IE contents

If the information transfer capability field (octet 3) indicates "speech", octets 4, 5, 5a, 5b, 6, 6a, 6b, 6c, 6d, 6e, 6f, 6g and 7 shall not be included.

If the information transfer capability field (octet 3) indicates "speech", octet 3a etc. shall be included only if the mobile station supports at least one speech version other than:

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- GSM full rate speech version 1; or
- GSM half rate speech version 1.

If the information transfer capability field (octet 3) indicates a value different from "speech", octets 4, 5, 6, 6a, 6b, and 6c shall be included, octets 6d, 6e, and 6f, and 6g are optional. In the network to MS direction in case octet 6d is included, octets 6e, and octet 6f, and 6g may be included. In the MS to network direction in case octet 6d is included octet 6e shall also be included and 6f and 6g may be included.

If the information transfer capability field (octet 3) indicates "facsimile group 3", the modem type field (octet 6c) shall indicate "none".

If the information transfer capability field (octet 3) indicates "other ITC" or the rate adaption field (octet 5) indicates "other rate adaption", octet 5a shall be included.

If the rate adaption field (octet 5) indicates "other rate adaption" and the other rate adaption field (octet 5a) indicates "V.120", octet 5b shall be included.
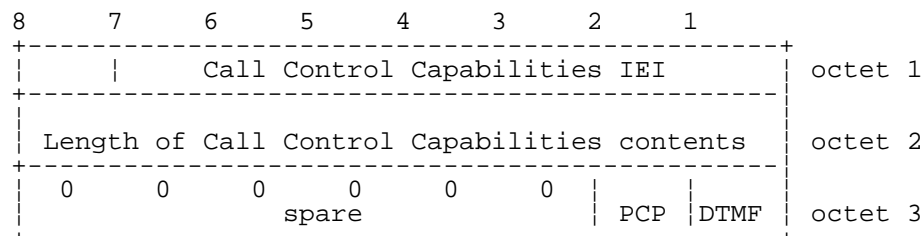
The modem type field (octet 6c) shall not indicate "autobauding type 1" unless the connection element field (octet 6c) indicates "non transparent".

10.5.4.5a   Call Control Capabilities

The purpose of the Call Control Capabilities information element is to identify the call control capabilities of the mobile station.

The Call Control Capabilities information element is coded as shown in figure 10.71a/GSM 04.08 and table 10.79a/GSM 04.08.

The Call Control Capabilities is a type 4 information element with a length of 3 octets.

```
8      7      6      5      4      3      2      1
+-----------------------------------------------+
¦      ¦     Call Control Capabilities IEI       ¦  octet 1
+-----------------------------------------------+
¦                                               ¦
¦ Length of Call Control Capabilities contents  ¦  octet 2
+-----------------------------------------------+
¦  0      0      0      0      0      0  ¦      ¦      ¦
¦                spare                   ¦ PCP  ¦DTMF  ¦  octet 3
+-----------------------------------------------+
```

Figure 10.71a/GSM 04.08
Call Control Capabilities information element

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CHANGE REQUEST No :	**A505**	*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

Technical Specification GSM / UMTS: 04.08   Version   6.3.0

Submitted to SMG [ ]   for approval **X**   Without presentation ("non-strategic") **X**
list plenary meeting or STC here ↑   for information **X**   with presentation ("strategic") [ ]

PT SMG CR cover form. Filename: crf26_3.doc

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

Work item: GPRS

Source: Vodafone.   **Date:**   17.03.1999

Subject: 'GPRS services not allowed' cause in the ATTACH REJECT (combined case).

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

Reason for change:

When the MS receives an ATTACH REJECT with cause # 7 (GPRS services not allowed) as an answer of a Combined GPRS Attach, the present specification states that 'a MS operating in operation mode B *may* then perform an IMSI attach for non-GPRS services by use of the MM IMSI attach procedure'.

However, it seems that there is nothing which prevents the MS to do so. Furthermore, as the user already indicated his wish to attach to non-GPRS, there is de-facto a requirement to perform an action. Making this action mandatory, as proposed, would allow the MS not to miss a CS paging.

Clauses affected: Sub-clause 4.7.3.2.4.

Other specs Affected:

Other releases of same spec	[ ]	→ List of CRs:	
Other core specifications	[ ]	→ List of CRs:	
MS test specifications / TBRs	[ ]	→ List of CRs:	
BSS test specifications	[ ]	→ List of CRs:	
O&M specifications	[ ]	→ List of CRs:	

Other comments:

4.7.3.2.4   Combined GPRS attach not accepted by the network

If the attach request can neither be accepted by the network for GPRS nor for non-GPRS services, an ATTACH REJECT message is transferred to the MS. The MS receiving the ATTACH REJECT message stops timer T3310 and takes one of the following actions depending upon the reject cause:

> # 3   (Illegal MS);
>
> # 6   (Illegal ME); or
>
> # 8   (GPRS services and non-GPRS services not allowed)

> The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (shall store it according to section 4.1.3.2) and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. The new GMM state is GMM-DEREGISTERED. The new MM state is MM IDLE.

> The MS shall set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number. The SIM shall be considered as invalid for GPRS and non-GPRS services until switching off or the SIM is removed.

> # 7   (GPRS services not allowed)

> The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to section 4.1.3.2) and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. The SIM shall be considered as invalid for GPRS services until switching off or the SIM is removed. The new GMM state is GMM-DEREGISTERED; the MM state is MM IDLE. A GPRS MS operating in MS operation mode A shall then perform an IMSI attach for non-GPRS services by use of the MM IMSI attach procedure; a GPRS MS operating in MS operation mode B shall ~~may~~ then perform an IMSI attach for non-GPRS services by use of the MM IMSI attach procedure.

CHANGE REQUEST No :	**A009**	*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

Technical Specification GSM	09.10	Version:	6.0.1

Submitted to SMG		for approval	**X**	Without presentation ("non-strategic")	**X**
list SMG plenary meeting no. here ↑		for information		with presentation ("strategic")	

PT SMG CR cover form is available from: http://docbox.etsi.org/tech-org/smg/Document/smg/tools/CR_form/crf28_1.zip

Proposed change affects: SIM ☐ ME **X** Network **X**
(at least one should be marked with an X)

Work item: GPRS

Source: Vodafone **Date:** March 19, 1999

Subject: GPRS ATTACH Reject cause when 'IMSI unknown'.

Category:

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

(one category and one release only shall be marked with an X)

Reason for change: The value part 'Unknown subscriber (IMSI unknown)' in the Routeing area updating message in GSM 09.02 should be mapped into 'GPRS services and non-GPRS services not allowed' in GSM 04.08, in order not to allow both GPRS and non-GPRS services.

Clauses affected: 3.4

Other specs affected:

Other releases of same spec		→ List of CRs:	
Other core specifications		→ List of CRs:	CR 04.08 A629 (Tdoc N1-99154)
MS test specifications / TBRs		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments: 04.08 CR A629 (Tdoc N1-99154), 'GPRS services and non-GPRS services not allowed: the behaviour of the MS', specifies the behaviour of the MS when receiving this cause value.

help.doc

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

3.4   Routeing area updating

	04.08	09.02	Notes
Forward message	GMM (ROUTEING AREA UPDATE REQUEST) MS classmark 1 MS classmark 4 GPRS Ciphering key seq number Mobile station identity Old routeing area identification	MAP_UPDATE_GPRS_LOCATION_request - - - IMSI -	
Positive results	GMM (ROUTEING AREA UPDATE ACCEPT) Routeing area identification Mobile station identity C Mobile station C Reject: IMSI unknown in HLR C Reject: MSC temporarily not reacheable	MAP_UPDATE_GPRS_LOCATION_response - - - - -	 1 2 3 4
Negative results	GMM (ROUTEING AREA UPDATE REJECT) Network failure GPRS services not allowed GPRS services and non-GPRS services not allowed C GPRS services not allowed C GPRS services and non-GPRS services not allowed MS identity cannot be derived by the network PLMN not allowed LA not allowed Roaming not allowed in this LA PLMN not allowed Illegal MS Illegal ME Network failure Network failure Network failure Network failure Network failure	MAP_UPDATE_GPRS_LOCATION_response - Unknown subscriber (no GPRS subscription) Unknown subscriber (IMSI unknown) Unknown subscriber (no GPRS subscription) Unknown subscriber (IMSI unknown) - Roaming not allowed: PLMN not allowed - - Operator determined barring - - System Failure Unexpected data value MAP_U/P_ABORT MAP_NOTICE MAP_CLOSE	 5 6 7 8 9 10

NOTE 1: The mobile station identity is inserted by the SGSN if the SGSN wants to deallocate or re-allocate a P-TMSI. If the SGSN wants to deallocate the P-TMSI it shall include the IMSI. If the SGSN wants to re-allocate the P-TMSI it shall include the new P-TMSI. If a P-TMSI is included, the MS shall respond with a ROUTEING AREA UPDATE COMPLETE message.

NOTE 2: The mobile station identity is inserted by the SGSN if it is received in a BSSAP+ LOCATION UPDATE ACCEPT message from the VLR. If a TMSI is included, the MS shall respond with a ROUTEING AREA UPDATE COMPLETE message. Only used in the Combined Routeing and Location Area procedure.

NOTE 3: This reject cause is inserted on the positive response by the SGSN if the SGSN receives a BSSAP+ LOCATION UPDATE REJECT message from the VLR indicating in the reject cause IMSI unknown in HLR. Only used in the Combined Routeing and Location Area procedure.

NOTE 4: This reject cause is inserted on the positive response by the SGSN if the SGSN does not receive any response from the VLR to a previous BSSAP+ LOCATION UPDATE REQUEST message. Only used in the Combined Routeing and Location Area procedure.

NOTE 5: The Unknown RA error is only generated as a result of incorrect information being inserted by the BSS.

NOTE 6: The HLR shall send Unknown subscriber with diagnostic value No GPRS subscription if the HLR indicates that there is an error in the type of subscription (i.e. SGSN requests service for a non-GPRS only subscriber).

NOTE 7: The HLR shall send Unknown subscriber with diagnostic value IMSI unknown if the HLR indicates that the IMSI provided by the SGSN is unknown.

NOTE 8: The HLR shall send Unknown subscriber with diagnostic value No GPRS subscription if the HLR indicates that there is an error in the type of subscription (i.e. SGSN requests service for a non-GPRS only subscriber). Used in the Combined Routeing and Location Area procedure.

NOTE 9: This reject cause is inserted if the SGSN receives a MAP GPRS UPDATE LOCATION negative response message indicating IMSI unknown. Used in the Combined Routeing and Location Area procedure.

NOTE 10: This reject cause is inserted if the SGSN does not receive any response from the old SGSN to a previous SGSN CONTEXT REQUEST message.

CHANGE REQUEST No :	**A024r1**	*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

Technical Specification GSM	09.18	Version:	6.3.0

Submitted to SMG		for approval	**X**	Without presentation ("non-strategic")	**X**
list SMG plenary meeting no. here ↑		for information		with presentation ("strategic")	

PT SMG CR cover form is available from: http://docbox.etsi.org/tech-org/smg/Document/smg/tools/CR_form/crf28_1.zip

Proposed change affects: SIM ☐   ME **X**   Network **X**
(at least one should be marked with an X)

Work item: GPRS

Source: Vodafone   **Date:**   March 23, 1999

Subject: Clarification of the null RA and other corrections.

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

Reason for change: Clarified that a null RA is defined by all the cells not supporting GPRS *within a location area*.
Timer T13 should be re-named T14 due to the new clause 13. Also the explanation for its 'relation to other timers' is wrong. This CR also Includes editorial corrections.

Clauses affected: 5.3, 13, 13.1, 14.2, Table 18.4.18 of sub-clause 18.4.18

Other specs affected: Other releases of same spec   → List of CRs:
                              Other core specifications   → List of CRs:
                              MS test specifications / TBRs   → List of CRs:
                              BSS test specifications   → List of CRs:
                              O&M specifications   → List of CRs:

Other comments:

help.doc

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

5.3   Procedures in the SGSN

The SGSN accepts BSSAP+-PAGING-REQUEST messages in any state of the association apart from Gs-NULL. Nevertheless the SGSN also accepts BSSAP+-PAGING-REQUEST messages in the Gs-NULL state if the 'SGSN-Reset' restoration indicator at the SGSN is set to 'true'. When an SGSN receives a BSSAP+-PAGING-REQUEST message from a VLR, the SGSN shall first check if the MS is known by the SGSN. The handling of the paging request depends on the state of the association and the MM context variables at the SGSN:

a)   The MS is known and the restoration indicator 'SGSN-Reset' at the SGSN is set to 'false':

-    If the MS is considered to be IMSI attached for GPRS and non-GPRS services (i.e. the association is not in the state Gs-NULL), the SGSN shall page the MS based on the location information stored in the SGSN.

-    If the MS is marked as IMSI detached for GPRS services or IMSI (implicitly or explicitly) detached for non-GPRS services (i.e. the state of the association is Gs-NULL), the SGSN shall return a BSSAP+-PAGING-REJECT message to that VLR indicating in the Gs Cause IE the detach circumstance ('IMSI detached for GPRS services', 'IMSI detached for non-GPRS services' or 'IMSI implicitly detached for non-GPRS services').

-    If the MS is marked as unreachable (i.e. the PPF flag is set to 'false') the SGSN shall return a BSSAP+-MS-UNREACHABLE message to that VLR indicating in the Gs Cause IE 'MS unreachable'. The state of the association does not change at the SGSN.

b)   The MS is known and the restoration indicator 'SGSN-Reset' at the SGSN is set to 'true':

-    If the BSSAP+-PAGING-REQUEST message includes the Location area identifier IE, the SGSN shall page the MS in all the routeing areas served by the SGSN that are included in the location area indicated in the Location area identifier IE.

-    If the BSSAP+-PAGING-REQUEST message does not include the Location area identifier IE, the SGSN may page in all the routeing areas served by the SGSN that are also served by the sending VLR.

c)   The MS is not known and the restoration indicator 'SGSN-Reset' at the SGSN is set to 'false':

-    The SGSN shall return a BSSAP+-PAGING-REJECT message to that VLR indicating in the Gs Cause IE 'IMSI unknown'.

d)   The MS is not known and the restoration indicator 'SGSN-Reset' at the SGSN is set to 'true':

-    If the VLR provides the Location area identifier IE, the SGSN shall page within the location area indicated by the VLR. Otherwise the SGSN may page in all the routeing areas served by the SGSN that are also served by the sending VLR.

If the SGSN accepts the paging request, the SGSN shall process the BSSAP+-PAGING-REQUEST message before sending the message on the Gb interface. The result of the processing on the BSSAP+-PAGING-REQUEST message is the PAGING CS message (see GSM 08.18) sent on the Gb interface.

The SGSN shall not retransmit the PAGING CS message.

If within the SGSN a location area there are cells that do not support GPRS services, the SGSN shall group these cells under a 'null RA'. The SGSN will perform the paging procedure described above within both the RA(s) derived from the location information and the 'null RA(s)' of the corresponding location area(s) (see GSM 04.08).

Note: the eMLPP priority information element relates to relative priorities within the paged MS and not to the priority in the sending of PAGING CS messages by the BSS.

*** Next modified section ***

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13   HLR failure

This chapter decribes the SGSN behaviour towards the ~~MSC/~~VLR as a consequence of an HLR reset.

13.1   General description

In the case of an HLR failure, the HLR informs the associated SGSNs about the recovery from an internal failure that has affected the association with the SGSNs according to the HLR reset procedure specified in <u>GSM </u>09.02.

This information is used in the SGSN to trigger the VLR to perform a location update towards the HLR in order to restore the HLR subscriber data,

13.2   Procedures in the SGSN

Upon receipt of a HLR reset indication from the HLR, the SGSN shall set the NGAF for all registered MSs in the SGSN for which a valid MSC/VLR-association exists.

Upon detection of any activity (either signalling or data) from the MS, the SGSN shall report to the VLR if the NGAF is set for this MS. If the SGSN detects GPRS signalling that leads to a procedure towards the VLR, the SGSN shall follow this procedure and reset the NGAF. If the SGSN detects activity that does not lead to any procedure towards the VLR, the SGSN shall send an BSSAP+-MS-ACTIVITY-INDICATION message towards the VLR and reset the NGAF. The activity indication may be delayed by the SGSN for a maximum operator-configuration depending time period to avoid high signalling load.

14   MS Information procedure

14.1   General description

The MS Information procedure is used by the VLR to request specific parameters about the MS. If the target MS for an MS Information procedure or a Provide Subscriber Info procedure (GSM 03.18, GSM 09.02) is GPRS attached (i.e. the state of the association to Gs-ASSOCIATED) the VLR may decide to perform the procedure via GPRS. The outcome of the MS Information procedure does not change the state of the association at the VLR or SGSN.

14.2   Procedures in the VLR

If the target MS for the MS information procedure is GPRS attached and the state of the association for the MS Gs-ASSOCIATED, the VLR may initiate the MS information procedure by transferring a BSSAP+-MS-INFORMATION-REQUEST message to the SGSN. If the state of the association is LA-UPDATE PRESENT, the VLR shall wait until this state is exited. The VLR starts the timer T~~13~~14. The BSSAP+-MS-INFORMATION-REQUEST message specifies the requested information parameters in the Information requested information element.

Upon receipt of a BSSAP+-MS-INFORMATION-RESPONSE the VLR shall stop timer T~~13~~14. If no BSSAP+-MS-INFORMATION-RESPONSE for that MS is received before the expiry of timer T~~13~~14 the VLR shall stop the Gs interface MS information procedure. The VLR may perform other actions to obtain the information about the MS (e.g. retry, or send a DTAP IDENTITY REQUEST message on the A interface).

18.4.18 Mobile station state

The Mobile station state IE is a TLV IE that indicates to the VLR the GMM and GSM states of the MS in the SGSN. The coding of the V field is as follows.

	8	7	6	5	4	3	2	1
Octet 1				IEI				
Octet 2				Length indicator				
Octet 3				Mobile station state value				

Figure 18.4.18/GSM 09.18: Mobile station state IE

Table 18.4.18/GSM 09.18: Mobile station state IE value part

```
Mobile station state value   (octet 3)
     Bits
8 7 6 5 4 3 2 1
0 0 0 0 0 0 0 0      IDLE
0 0 0 0 0 0 0 1      STANDBY, 0 PDP contexts active
0 0 0 0 0 0 1 0      STANDBY, 1 or more PDP contexts active
0 0 0 0 0 0 1 1      SUSPENDED, 0 PDP contexts active
0 0 0 0 0 1 0 0      SUSPENDED, 1 or more PDP contexts active
0 0 0 0 0 1 0 1      READY, 0 or more PDP contexts active
0 0 0 0 0 1 1 0      READY, 1 or more PDP contexts active
0 0 0 0 0 1 1 1      IMSI unknown
0 0 0 0 1 0 0 0      Information requested not supported
0 0 0 0 1 0 0 1      Shall not be sent in this version of the protocol.
        to           If received, shall be treated as '00001000'.
1 1 1 1 1 1 1 1
```

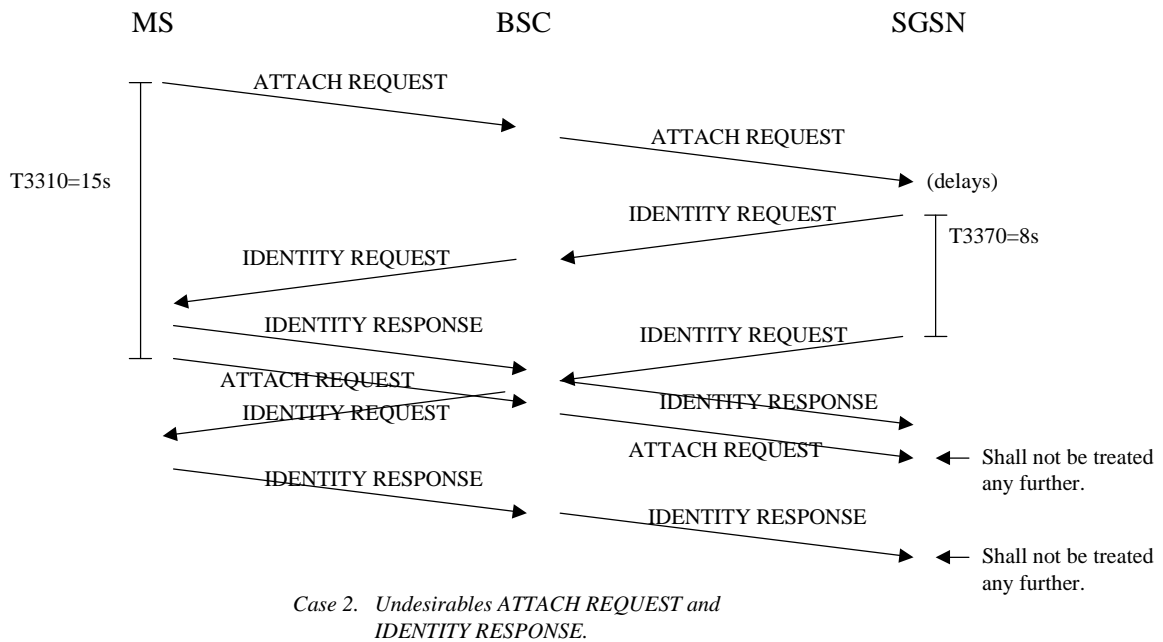# 19   List of system variables

19.1   Timers

This subclause lists the management timers specified for the operation of the BSSAP+ protocol. All the implementation shall support the range of values specified below. The specific value of the timers shall be under the control of the operator.

Table 19.1/GSM 09.18: Management Timers

Timer name	Default value	Timer range	Granula-rity	Notes	Relation to other timers
T5	-	2-20 secs	100 ms	Guards the Paging procedure at the VLR.	Value is correlated to DRX parameter Split PG CYCLE (max possible = 16 sec) Default should be set acc. to max split cycle supported by the SGSN (operator choice)
T6-1	-	10-90 secs	1 sec	Guards the Location Update procedure.	It should be higher than 2 times the maximum transmission time in the Gs interface, plus the supervision timer of the Update Location procedure [GSM 09.02]
T6-2	40 secs	5-60 secs	1 sec	Guards the TMSI reallocation procedure.	It should be higher than 2 times the maximum transmission time in the Gs interface, plus 4 times T3350 [GSM 04.08]
T7	4 secs	1-30 secs	1 sec	Guards the Non-GPRS alert procedure.	None.
T8	4 secs	1-30 secs	1 sec	Guards the Explicit IMSI detach from GPRS services procedure.	None.
T9	4 secs	1-30 secs	1 sec	Guards the Explicit IMSI detach from non-GPRS services procedure.	None.
T10	4 secs	1-30 secs	1 sec	Guards the Implicit IMSI detach from non-GPRS services procedure.	None.
T11	4 secs	1-120 secs	1 sec	Guards the VLR reset procedure.	None.
T12-1	-	8 - 60x384+6 8 secs	1min	Controls the resetting of the 'SGSN-Reset' variable.	It should be longer than the longest Periodic RAU timer running on the SGSN, plus the transmission delay on the radio interface.
T12-2	4 secs	1-120 secs	1 sec	Guards the SGSN reset procedure.	None.
T~~13~~14	-	4-36 secs	1 sec	Guards the MS Information procedure.	~~It should be higher than 2 times the maximum transmission time in the Gs interface, plus 4 times T3370 [GSM 04.08]~~ None.

NOTE : The Default value is the recommended value.

ETSI SMG3 WPA
Sophia-Antipolis, France.
22-25 March, 1999.

Tdoc N1-99184
Revision of Tdoc N1-99037

CHANGE REQUEST No :   **A467r2**   *Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

Technical Specification GSM / UMTS: 04.08   Version   6.3.0

Submitted to SMG | for approval   **X** | without presentation ("non-strategic")   **X**
list plenary meeting or STC here ↑ | for information | With presentation ("strategic")

PT SMG CR cover form. Filename: crf26_3.doc

Proposed change affects: SIM ☐   ME ☐   Network **X**
(at least one should be marked with an X)

Work item: GPRS.

Source: Vodafone.   **Date:** 23/03/99.

Subject: Multiple ATTACH REQUEST attempts and GMM-common procedures: abnormal cases on the network side.

Category:

F	Correction	**X**	
A	Corresponds to a correction in an earlier release		
B	Addition of feature		
C	Functional modification of feature		
D	Editorial modification		

(one category and one release only shall be marked with an X)

Release:

Phase 2	
Release 96	
Release 97	**X**
Release 98	
Release 99	
UMTS	

Reason for change:

MS   BSC   SGSN

Case 1. Undesirable ATTACH REQUEST.

Case 2. Undesirables ATTACH REQUEST and IDENTITY RESPONSE.

(Reason for change:)	In *Case 1* and *Case 2*, we have an undesirable ATTACH REQUEST, due to a loss of the IDENTITY REQUEST message or due to delays before invoking the GMM-common procedure after receiving the ATTACH REQUEST. In *Case 2*, we have in addition an undesirable IDENTITY RESPONSE message (this would be similar for an AUTHENTICATION AND CIPHERING message).
	At the present time, the network will resend the ATTACH ACCEPT message. Then the MS will re-send the ATTACH COMPLETE message if the PTMSI was included, or may as well interpret it as an error. The network may also keep repeating the e.g. IDENTITY REQUEST message as an answer to the ATTACH REQUEST (up to 4 times).
	Therefore, this CR corrects the Abnormal cases on the network side for the GPRS attach and combined attach procedures. It also highlights that this is not an error for the network to receive subsequent IDENTITY RESPONSE or AUTHENTICATION AND CIPHERING MESSAGES (sub-clause 8.4). Also T3322, T3350, T3360 and T3370 were reduced from 8 to 6 seconds.
Clauses affected:	4.7.3.1.6, 4.7.3.2.6, 4.7.7.6, 4.7.8.4, 8.4, and table 11.4 of 11.2.2.

Other specs Affected:	Other releases of same spec		→ List of CRs:	
	Other core specifications		→ List of CRs:	
	MS test specifications / TBRs		→ List of CRs:	
	BSS test specifications		→ List of CRs:	
	O&M specifications		→ List of CRs:	

Other comments:	Also CR 04.08 A469r1 (Tdoc N1-9938) including the detail of the GSM 08.18 FLUSH procedure is useful to understand how the problem can happen.

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

*** For information ***

4.7.3.1 GPRS attach procedure for GPRS services

The GPRS attach procedure is a GMM procedure used by GPRS MSs to IMSI attach for GPRS services only. The attach type information element shall indicate "GPRS attach".

*** First modified section ***

4.7.3.1.6 Abnormal cases on the network side

The following abnormal cases can be identified:

a) Lower layer failure

If a low layer failure occurs before the message ATTACH COMPLETE has been received from the MS and a new P-TMSI (or a new P-TMSI and a new P-TMSI signature) has been assigned, the network shall consider both the old and new P-TMSI each with its corresponding P-TMSI-signature as valid for a certain recovery time and shall not resent the message ATTACH ACCEPT. During this period the network may:

- consider the new P-TMSI only as valid, if it is used by the MS in a subsequent message;
- use the identification procedure followed by a P-TMSI reallocation procedure if the old P-TMSI is used by the MS in a subsequent message.

b) Protocol error

If the ATTACH REQUEST message is received with a protocol error, the network shall return an ATTACH REJECT message with one of the following reject causes:

#96: Mandatory information element error;

#99: Information element non-existent or not implemented;

#100: Conditional IE error;

#111: Protocol error, unspecified.

c) T3350 time-out

On the first expiry of the timer, the network shall retransmit the ATTACH ACCEPT message and shall reset and restart timer T3350.

This retransmission is repeated four times, i.e. on the fifth expiry of timer T3350, the GPRS attach procedure shall be aborted. If a new P-TMSI or a new P-TMSI together with a new P-TMSI signature were allocated in the ATTACH ACCEPT message, the network shall consider both the old and new P-TMSI each together with the corresponding P-TMSI signatures as valid for a certain recovery time. During this period the network acts as specified for case a.

d.1) ~~More than one~~ ATTACH REQUEST received after the ATTACH ACCEPT message has been sent and before the ATTACH COMPLETE message is received

~~If an ATTACH REQUEST message is received before a previously initiated GPRS attach procedure has resulted in a transition into state GMM-REGISTERED~~

- If ~~and the indicated RAI indicated~~ one or more of the information elements in the ATTACH REQUEST message differ~~s~~ from the ~~RAI~~ ones received within the previous ATTACH REQUEST message, the previously initiated GPRS attach procedure shall be aborted and the new GPRS attach procedure shall be progressed ; or~~.~~

- ~~If the RAI does not~~no information element differ, then the ATTACH ACCEPT message shall be resent.

d.2) More than one ATTACH REQUEST received and no ATTACH ACCEPT or ATTACH REJECT message has been sent

- If ~~the RAI indicated~~ one or more of the information elements in the ATTACH REQUEST message differ~~s~~ from the ~~RAI~~ ones received within the previous ATTACH REQUEST message, the previously initiated GPRS attach procedure shall be aborted and the new GPRS attach procedure shall be progressed ;

- If the ~~RAI~~ information elements do~~es~~ not differ, then the network shall continue with the previous attach procedure and shall not treat any further this ATTACH REQUEST message.

e) ATTACH REQUEST received in state GMM-REGISTERED

If an ATTACH REQUEST message is received in state GMM-REGISTERED the network may initiate the GMM common procedures; if it turned out that the ATTACH REQUEST message was send by an MS that has already been attached, the GMM context and PDP contexts, if any, are deleted and the new ATTACH REQUEST is progressed.

f) ROUTING AREA UPDATE REQUEST message received before ATTACH COMPLETE message.

Timer T3350 shall be stopped. The allocated P-TMSI shall be considered as valid and the routing area updating procedure shall be progressed as described in section 4.7.5.
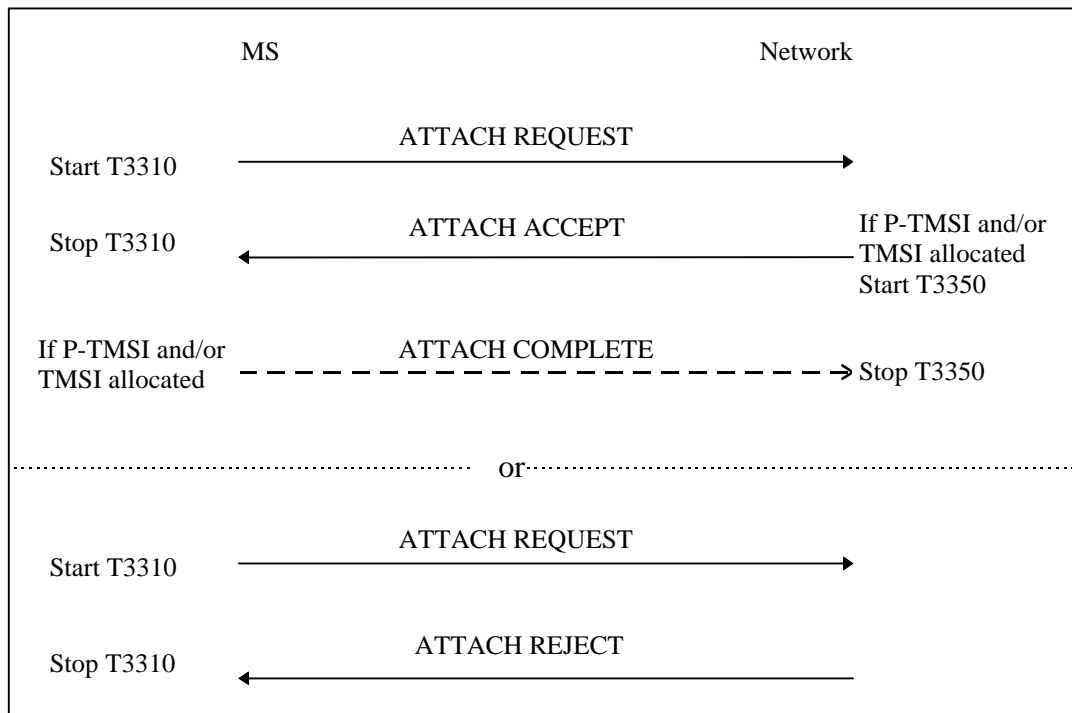
Figure 4.7.3/1 GSM 04.08: GPRS attach procedure and combined GPRS attach procedure

4.7.3.2 Combined GPRS attach procedure for GPRS and non-GPRS services

The combined GPRS attach procedure is a GMM procedure used by a GPRS MS operating in MS operation modes A or B for IMSI attach for GPRS and non-GPRS services.

If a GPRS MS operating in MS operation modes A or B is already attached for non-GPRS services by use of the MM specific IMSI attach procedure, but additionally wishes to perform an IMSI attach for GPRS services, the combined GPRS attach procedure shall also be used.

The attach type information element shall indicate "combined GPRS attach". In this case, the messages ATTACH ACCEPT, ATTACH COMPLETE, and ATTACH REJECT used by the combined GPRS attach procedure carry information for both the GPRS and the non-GPRS services.

*** Next modified section ***

4.7.3.2.6   Abnormal cases on the network side

The abnormal cases specified in section 4.7.3.1.6 apply with the following exception for cases a, c and d in the above referenced section:

a) Low layer failure

If a low layer failure occurs before the message ATTACH COMPLETE has been received from the MS and a new P-TMSI and/or TMSI has been assigned, the network shall consider both the old and new P-TMSI and/or TMSI as valid for a certain recovery time and shall not resent the message ATTACH ACCEPT. During this period the network may:

-   consider the new P-TMSI and/or TMSI only as valid, if it is used by the MS in a subsequent message,
-   use the identification procedure followed by a P-TMSI and/or TMSI reallocation procedure if the old P-TMSI and/or TMSI is used by the MS in a subsequent message.

b) T3350 time-out

On the first expiry of the timer, the network shall retransmit the ATTACH ACCEPT message and shall reset and restart timer T3350. This retransmission is repeated four times, i.e. on the fifth expiry of timer T3350, the GPRS attach procedure shall be aborted. If a new P-TMSI or a new P-TMSI together with a new P-TMSI signature and/or TMSI were allocated in the ATTACH ACCEPT message, the network shall consider both the old and new P-TMSI each together with the corresponding P-TMSI signatures and/or the old and new TMSI as valid for a certain recovery time. During this period the network acts as specified for case a.

c.1)   ~~More than one~~ ATTACH REQUEST received after the ATTACH ACCEPT message has been sent and before the ATTACH COMPLETE message is received

If an ATTACH REQUEST message is received before a previously initiated GPRS attach procedure has resulted in a state transition to the state GMM-REGISTERED state

- ~~and~~If ~~the indicated RAI indicated~~one or more of the information elements in the ATTACH REQUEST message differ~~s~~ from the ~~RAI~~ones included in the previous ATTACH REQUEST message, the previously initiated GPRS attach procedure shall be aborted and the new GPRS attach procedure shall be progressed~~.~~ ; or

- ~~-~~If the ~~RAI~~information elements doe~~s~~ not differ, the ATTACH ACCEPT message shall be re-transmitted with the same P-TMSI and/or P-TMSI signature and/or TMSI as in the earlier message if the P-TMSI and/or TMSI reallocation shall be performed.

c.2)   More than one ATTACH REQUEST received and no ATTACH ACCEPT or ATTACH REJECT message has been sent

- ~~-~~ If ~~the RAI indicated~~ one or more of the information elements in the ATTACH REQUEST message differs from the ~~RAI~~ones received within the previous ATTACH REQUEST message, the previously initiated GPRS attach procedure shall be aborted and the new GPRS attach procedure shall be progressed ;

- If the ~~RAI~~information elements doe~~s~~ not differ, then the network shall continue with the previous attach procedure and shall not treat any further this ATTACH REQUEST message.

*** Next modified section ***

4.7.7.6 Abnormal cases on the network side

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 enter the state GMM-DEREGISTERED.

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 and the network shall enter the state GMM-DEREGISTERED.

 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 ~~the RAI indicated~~ one or more of the information elements in the ATTACH REQUEST message differ~~s~~ from the ~~RAI~~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 ~~RAI~~ information elements do~~es~~ 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 section 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.
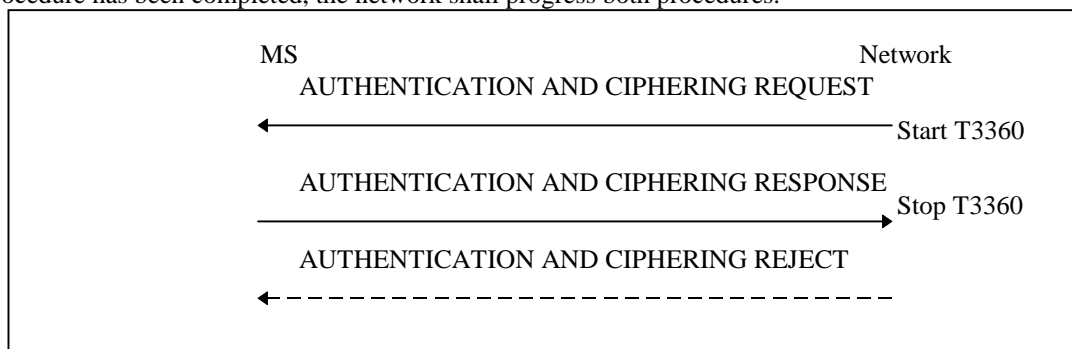
```
MS                                                Network
        AUTHENTICATION AND CIPHERING REQUEST
     <───────────────────────────────────────── Start T3360

        AUTHENTICATION AND CIPHERING RESPONSE
     ─────────────────────────────────────────> Stop T3360

        AUTHENTICATION AND CIPHERING REJECT
     <- - - - - - - - - - - - - - - - - - - - - -
```

Figure 4.7.7/1 GSM 04.08: Authentication and ciphering procedure

4.7.8 Identification procedure

The identification procedure is used by the network to request an MS to provide specific identification parameters to the network e.g. International Mobile Subscriber Identity, International Mobile Equipment Identity (see GSM 03.03). For the presentation of the IMEI, the requirements of GSM 02.09 apply.

4.7.8.1 Identification initiation by the network

The network initiates the identification procedure by transferring an IDENTITY REQUEST message to the MS and starts the timer T3370. The IDENTITY REQUEST message specifies the requested identification parameters in the identity type information element.

4.7.8.2 Identification response by the MS

An MS that has been attached to GPRS shall be ready to respond to an IDENTITY REQUEST message at any time. Upon receipt of the IDENTITY REQUEST message the MS sends back an IDENTITY RESPONSE message. The IDENTITY RESPONSE message shall contain the identification parameters as requested by the network.

4.7.8.3 Identification completion by the network

Upon receipt of the IDENTITY RESPONSE the network shall stop timer T3370.

4.7.8.4 Abnormal cases on the network side

The following abnormal cases can be identified:

a) Lower layer failure

Upon detection of a lower layer failure before the IDENTITY RESPONSE is received, the network shall abort any ongoing GMM procedure.

b) Expiry of timer T3370

The identification procedure is supervised by the network by the timer T3370. The network shall, on the first expiry of the timer T3370, retransmit the IDENTITY REQUEST message and reset and restart the timer T3370. This retransmission is repeated four times, i.e. on the fifth expiry of timer T3370, the network shall abort the identification procedure and any ongoing GMM procedure.

c) Collision of an identification procedure with a GPRS attach procedure

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

d) Collision of an identification procedure with a GPRS attach procedure when the identification procedure has been caused by a GPRS attach procedure

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

-    If the RAI indicated one or more of the information elements in the ATTACH REQUEST message differs from the RAI ones received within the previous ATTACH REQUEST message, the network shall proceed with the GPRS attach procedure ; or

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

Collision of an identification procedure with an MS initiated GPRS detach procedure
GPRS detach containing cause "power off":

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

*** Next modified section ***

8.4   Unknown or unforeseen message type

If a mobile station receives a message with message type not defined for the PD or not implemented by the receiver in unacknowledged mode, it shall ignore the message.

If a mobile station receives a message with message type not defined for the PD or not implemented by the receiver in acknowledged mode, it shall return a status message (STATUS, RR STATUS or MM STATUS or GMM STATUS depending on the protocol discriminator) with cause # 97 "message type non-existent or not implemented".

If the network receives an RR message or MM message with message type not defined for the PD or not implemented by the receiver in a protocol state where reception of an unsolicited message with the given PD from the mobile station is not foreseen in the protocol, the network actions are implementation dependent. Otherwise, if the network receives a message with message type not defined for the PD or not implemented by the receiver, it shall ignore the message except that it should return a status message (STATUS, RR STATUS or MM STATUS or GMM STATUS depending on the protocol discriminator) with cause #97 "message type non-existent or not implemented".

NOTE: A message type not defined for the PD in the given direction is regarded by the receiver as a message type not defined for the PD, see GSM 04.07 [20].

If the mobile station receives a message not compatible with the protocol state, the mobile station shall ignore the message except for the fact that, if an RR connection exists, it returns a status message (STATUS, RR STATUS or MM STATUS depending on the protocol discriminator) with cause #98 "Message type not compatible with protocol state". When the message was a GMM message the GMM-STATUS message with cause #98 "Message type not compatible with protocol state" shall be returned.

If the network receives a message not compatible with the protocol state, the network actions are implementation dependent.

NOTE: The use by GMM and SM of unacknowledged LLC may lead to messages "not compatible with the protocol state".

*** Next modified section ***

Table 11.4/GSM 04.08: GPRS Mobility management timers - network side

TIMER NUM.	TIMER VALUE	STATE	CAUSE OF START	NORMAL STOP	ON THE 1st , 2nd, 3rd , 4th EXPIRY
T3313	Note 1	GMM-REG	Paging procedure initiated	Paging procedure completed	Network dependent
T3322	6s	GMM-DEREG-INIT	DETACH REQ sent	DETACH ACCEPT received	Retransmission of DETACH REQUEST
T3350	6s	GMM-COMMON-PROC-INIT	ATTACH ACCEPT sent with P-TMSI and/or TMSI RAU ACCEPT sent with P-TMSI and/or TMSI P-TMSI REALLOC COMMAND sent	ATTACH COMPLETE received RAU COMPLETE received P-TMSI REALLOC COMPLETE received	Retransmission of the same message type, i.e. ATTACH ACCEPT, RAU ACCEPT or REALLOC COMMAND
T3360	6s	GMM-COMMON-PROC-INIT	AUTH AND CIPH REQUEST sent	AUTH AND CIPH RESPONSE received	Retransmission of AUTH AND CIPH REQUEST
T3370	6s	GMM-COMMON-PROC-INIT	IDENTITY REQUEST sent	IDENTITY RESPONSE received	Retransmission of IDENTITY REQUEST

Table 11.4a/GSM 04.08: GPRS Mobility management timers - network side

TIMER NUM.	TIMER VALUE	STATE	CAUSE OF START	NORMAL STOP	ON EXPIRY
T3314 READY	Default 44 sec Note 2	All except GMM-DEREG	Receipt of a PTP PDU	Forced to Standby	The network shall page the MS if a PTP PDU has to be sent to the MS
T3316 AA-READY	Default 44 sec Note 2	-	Receipt of a PTP PDU	-	-
Mobile Reachable	Default 4 min greater than T3312	All except GMM-DEREG	Change from READY to STANDBY state or Gb interface RESUME message	PTP PDU received or Gb interface SUSPEND message	Network dependent but typically paging is halted on 1st expiry

NOTE 1: The value of this timer is network dependent.
NOTE 2: The default value of this timer is used if neither the MS nor the Network send another value, or if the Network sends this value, in a signalling procedure. The value of this timer should be slightly shorter in the network than in the MS, this is a network implementation issue.
NOTE 3: Typically, the procedures are aborted on the fifth expiry of the relevant timer. Exceptions are described in the corresponding procedure description.

ETSI SMG3 WPA
Sophia-Antipolis, France.
22-25 March, 1999.

Tdoc N1-99182
Revision of Tdoc N1-99038

CHANGE REQUEST No :	**A469r2**	*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

Technical Specification GSM / UMTS: 04.08   Version   6.3.0

Submitted to SMG		for approval	**X**	without presentation ("non-strategic")	**X**
list plenary meeting or STC here ↑		for information		With presentation ("strategic")	

PT SMG CR cover form. Filename: crf26_3.doc

Proposed change affects: SIM ☐   ME ☐   Network **X**
(at least one should be marked with an X)

Work item: GPRS.

Source: Vodafone.   **Date:**   21/01/1999.

Subject: Introduction of the A&C reference number information element in the AUTHENTICATION AND CIPHERING REQUEST and RESPONSE messages.

Category:

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

(one category and one release only shall be marked with an X)

(Reason for change:)
Reason for change:

Change of RA in the same SGSN and same BSC →

MS

The previous diagram depicts how a misunderstanding can happen concerning *which* AUTHENTICATION AND CIPHERING RESPONSE message the network is treating. Therefore, the SRES will not be the one expected. The authentication will then fail. The network will send the AUTHENTICATION AND CIPHERING REJECT to the MS.

It is worth noting that, according to ... when the SGSN detects a cell change of an MS from a cell up ... ate, LLC-SDU(s) for a given TLLI stored at an 'old' BVCI (corresponding to the old cell so far) can be transferred to a 'new' BVCI (corresponding to a new cell so far) with which the TLLI is currently associated, in the case of a cell change within one BSS (see page 6). The message will consequently reach the MS in the new cell.

Therefore, this CR adds A&C reference number information elements in the AUTHENTICATION AND CIPHERING REQUEST and RESPONSE messages. The network can then choose to allocate a value different for each message for each RA. Then it can know what it is treating and react accordingly.

BSS
SGSN

ATTACH REQUEST
ATTACH REQUEST
ATTACH REQUEST
AUTHENTICATION AND CIPHERING REQUEST
A&C REQUEST 1
FLUSH-LL
(old cell) (new cell)
A&C REQUEST 2
A&C RESPONSE 1

Misunderstanding concerning the A&C RESPONSE message.

Message 1 is perceived as an answer of Message 2.

Clauses affected: 4.7.7.2, 4.7.7.3, 9.4.9, 9.4.10 and 10.5.5.19 (created).

Other specs Affected:

Other releases of same spec		→ List of CRs:	
Other core specifications		→ List of CRs:	
MS test specifications / TBRs		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments: *'Upon receipt of an AUTHENTICATION AND CIPHERING REJECT message, the MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED and shall delete the P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number stored. If available, also the TMSI, LAI, ciphering key sequence number shall be deleted and the update status shall be set to U3 ROAMING NOT ALLOWED.* **The SIM shall be**

considered as invalid until switching off or the SIM is removed'. GSM 04.08, 6.3.0.
It is then not possible to solve this problem by any re-attempt.

(This CR does not complicate the treating of the error cases at the MS, which only has to copy the received information element).

When the AUTHENTICATION AND CIPHERING REQUEST message is re-sent due to timer T3360 expiry on the network side, then the value of the A&C reference number information element in the re-transmitted message is the same than in the previous one (as it is always the case for an IE within a re-transmitted message).

4.7.7 Authentication and ciphering procedure

The purpose of the authentication and ciphering procedure is threefold:
- First, to permit the network to check whether the identity provided by the MS is acceptable or not see GSM 03.20 [13]); and
- Second, to provide parameters enabling the MS to calculate a new GPRS ciphering key; and
- Third, to let the network set the ciphering mode (ciphering/no ciphering) and algorithm.

The cases in which the authentication and ciphering procedure shall be used are defined in GSM 02.09 [5].

The authentication and ciphering procedure is always initiated and controlled by the network. It shall be performed in a non ciphered mode because of the following reasons:
- the network cannot decipher a ciphered AUTHENTICATION AND CIPHERING RESPONSE from an unauthorised MS and put it on the black list; and
- to be able to define a specific point in time from which on a new GPRS ciphering key should be used instead of the old one.

The network should not send any user data during the authentication and ciphering procedure.

4.7.7.1 Authentication and ciphering initiation by the network

The network initiates the authentication and ciphering procedure by transferring an AUTHENTICATION AND CIPHERING REQUEST message across the radio interface and starts timer T3360. The AUTHENTICATION AND CIPHERING REQUEST message shall contain all parameters necessary to calculate the response parameters (see GSM 03.20 [13]). It also contains the GPRS ciphering key sequence number, allocated to the GPRS ciphering key, and the GPRS ciphering algorithm.

The network includes the A&C reference number information element in the AUTHENTICATION AND CIPHERING REQUEST message. Its value is chosen in order to link an AUTHENTICATION AND CIPHERING REQUEST in a RA with its RESPONSE. The A&C reference number value might be based on the RA Colour Code value.

Additionally, the network may request the MS to include its IMEISV in the AUTHENTICATION AND CIPHERING RESPONSE message.

4.7.7.2 Authentication and ciphering response by the MS

An MS that is attached to GPRS shall be ready to respond upon an AUTHENTICATION AND CIPHERING REQUEST message at any time. Upon receipt of the message, it processes the challenge information and sends an AUTHENTICATION AND CIPHERING RESPONSE message to the network. The value of the received A&C reference number information element shall be copied into the A&C reference number information element in the AUTHENTICATION AND CIPHERING RESPONSE message. The new GPRS ciphering key calculated from the challenge information shall overwrite the previous one. It shall be stored and shall be loaded into the ME before the AUTHENTICATION AND CIPHERING RESPONSE message is transmitted. The GPRS ciphering key sequence number shall be stored together with the calculated key.

The GMM layer shall notify the LLC layer if ciphering shall be used or not and if yes which algorithm and GPRS ciphering key that shall be used (see GSM 04.64 [76]).

4.7.7.3 Authentication and ciphering completion by the network

Upon receipt of the AUTHENTICATION AND CIPHERING RESPONSE message, the network stops the timer T3360 and checks the validity of the response (see GSM 03.20 [13]). For this, it may use the A&C reference number information element within the AUTHENTICATION AND CIPHERING RESPONSE message to determine whether the response is correlating to the last request that was sentd out which response it is treating.

The GMM layer shall notify the LLC sublayer if ciphering shall be used or not and if yes which algorithm and GPRS ciphering key that shall be used (see GSM 04.64 [76]).

*** Next modified section ***

9.4.9 Authentication and ciphering request

This message is sent by the network to the MS to initiate authentication of the MS identity. Additionally, the ciphering mode is set, indicating whether ciphering will be performed or not. See table 9.4.9/GSM 04.08.

Message type: AUTHENTICATION AND CIPHERING REQUEST
Significance: dual
Direction: network to MS

Table 9.4.9/GSM 04.08: AUTHENTICATION AND CIPHERING REQUEST 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
	Authentication and ciphering request message identity	Message type 10.4	M	V	1
	Ciphering algorithm	Ciphering algorithm 10.5.5.3	M	V	1/2
	GPRS ciphering key sequence number	Ciphering key sequence number 10.5.1.2	M	V	1/2
	IMEISV request	IMEISV request 10.5.5.10	M	V	1/2
	Force to standby	Force to standby 10.5.5.7	M	V	1/2
	A&C reference number	A&C reference number 10.5.5.19	M	V	1/2
	Spare half octet	Spare half octet 10.5.1.8	M	V	1/2
2A	GPRS ciphering key sequence number	Ciphering key sequence number 10.5.1.2	O	TV	1
21	Authentication parameter RAND	Authentication parameter RAND 10.5.3.1	O	TV	17

9.4.9.1 GPRS ciphering key sequence number

This IE shall only be included if authentication shall be performed.

9.4.9.2 Authentication Parameter RAND

This IE shall only be included if authentication shall be performed.

9.4.10 Authentication and ciphering response

This message is sent by the MS to the network in response to an *Authentication and ciphering request* message. See table 9.4.10/GSM 04.08.

Message type: AUTHENTICATION AND CIPHERING RESPONSE
Significance: dual
Direction: MS to network

Table 9.4.10/GSM 04.08: AUTHENTICATION AND CIPHERING RESPONSE 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
	Authentication and ciphering response message identity	GPRS message type 10.4	M	V	1
	A&C reference number	A&C reference number 10.5.5.19	M	V	1/2
	Spare half octet	Spare half octet 10.5.1.8	M	V	1/2
22	Authentication parameter SRES	Authentication parameter SRES 10.5.3.2	O	TV	5
23	IMEISV	Mobile identity 10.5.1.4	O	TLV	11

9.4.10.1 Authentication Parameter SRES

This IE is included if authentication was requested within the corresponding *authentication and ciphering request* message.

9.4.10.2 IMEISV

This IE is included if requested within the corresponding *authentication and ciphering request* message.

*** For information only ***

## 10.5.5 GPRS mobility management information elements

*** Next modified section ***

10.5.5.19   A&C reference number

The purpose of the A&C reference number information element is to indicate to the network in the AUTHENTICATION AND CIPHERING RESPONSE message which AUTHENTICATION AND CIPHERING REQUEST message the MS is replying to.

The A&C reference number is a type 1 information element.

The A&C reference number information element is coded as shown in figure 10.5.123/GSM 04.08 and table 10.5.140/GSM 04.08.

8	7	6	5	4	3	2	1	
A&C reference number IEI				A&C reference number value				octet 1
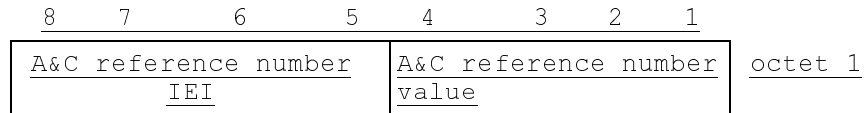
Figure 10.5.134/GSM 04.08: A&C reference number information element

Table 10.5.152/GSM 04.08: A&C reference number information element

A&C reference number value (octet 1)
Unformatted 4 bit field

8   Signalling procedures between NM SAPs

8.1   FLUSH-LL (logical link) procedure

When an SGSN detects a cell change of an MS from a cell update or a routing area update, the SGSN shall send a FLUSH-LL PDU to the old BVC to initiate the following procedures:

- At a cell change within one NSE (e.g. the BSS is a NSE), LLC-SDU(s) for a given TLLI stored at an "old" BVCI (corresponding to the old cell) are either deleted or transferred to a "new" BVCI (corresponding to the new cell) with which the TLLI is currently associated; or
- At a cell change between two NSEs, LLC-SDU(s) stored at the "old" BVCI for the TLLI are deleted.

The SGSN provides the BSSGP with:

- a MS´s TLLI identifying the MS;
- the "old" BVCI identifying the cell in which to find buffered LLC-SDU(s) for the MS; and
- the "new" BVCI identifying the cell to which the MS is currently associated (only when within the same NSE).

If a "new" BVCI is not provided, then the FLUSH-LL PDU shall be interpreted as an instruction to delete the queued LLC-SDU(s) at the old BVC.

Queued BSSGP signalling, e.g. pages, shall not be affected by this procedure.

In response to a FLUSH-LL PDU the BSS shall send a FLUSH-LL-ACK PDU to the SGSN containing:

- the TLLI received in the FLUSH-LL PDU; and
- an indication of whether the LLC-SDU(s) were "transferred" (when in the same NSE) or "deleted".

On receipt of a FLUSH-LL-ACK PDU by the SGSN, indicating that the LLC-SDU(s) associated with the old BVC have been "deleted", the SGSN may choose to:

- immediately re-transmit all un-acknowledged LLC-SDU(s) (in acknowledged LLC operation) to the MS at the new BVC (ie new cell); or
- relay on LLC retransmission mechanism to transmit un-acknowledged LLC-SDU(s).

On receipt of a FLUSH-LL-ACK PDU by the SGSN, indicating that the LLC-SDU(s) associated with the old BVC have been "transferred" within the NSE, the SGSN shall not take any of the above actions.

8.1.1 Abnormal Conditions

If the BSS receives a FLUSH-LL PDU for an unknown BVCI or TLLI not associated with the given BVCI, then the FLUSH-LL PDU is discarded and no FLUSH-LL-ACK PDU is returned.

If the SGSN does not receive a FLUSH-LL-ACK PDU in response to a FLUSH-LL PDU, no further action is taken.

CHANGE REQUEST No :	**A051r1**	*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

Technical Specification GSM / UMTS:	04.64	Version	6.3.0

Submitted to SMG **#28**
list plenary meeting or STC here ↑

for approval	**X**	without presentation ("non-strategic")	
for information		with presentation ("strategic")	

PT SMG CR cover form. Filename: crf26_3.doc

Proposed change affects: SIM [ ] ME [X] Network [X]
(at least one should be marked with an X)

Work item: GPRS

Source: Rapporteur   **Date:** 4 March, 1999

Subject: Signalling SAPI 1 information field length

Category:

(one category and one release only shall be marked with an X)

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

Reason for change:

The minimum value for N201-U for SAPI 1 may be too short to allow LLC to carry the longest GPRS mobility management and session management messages. Currently, the longest message is the SM Activate PDP Context Request message that carries the Access Point Name and Protocol Configuration Options information elements. APN is limited to 100 octets, while PCO can be 150 octets. A longer PCO than 150 octets is foreseen for the future.

In order to allow long SM and GMM messages, it is proposed to increase the minimum value for N201-U for SAPI 1to 400 octets.

Clauses affected: 6.4.1.6,

Other specs affected:

Other releases of same spec		→ List of CRs:
Other core specifications		→ List of CRs:
MS test specifications / TBRs		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

help.doc

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

6.4.1.6 Exchange Identification (XID) command/response

Text not changed.

Table 1: LLC layer parameter negotiation

Parameter Name	Type	Length	Format (87654321)	Range	Units	Sense of Negotiation
Version (LLC version number)	0	1	0000bbbb	0 through 15	-	down
IOV-UI (ciphering Input offset value for UI frames), common for all SAPIs of a TLLI	1	4	bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb	0 through 2^{32} - 1	-	-
IOV-I (ciphering Input offset value for I frames), for the SAPI under negotiation	2	4	bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb	0 through 2^{32} - 1	-	-
T200 (retransmission time-out)	3	2	0000bbbb bbbbbbbb	1 through 4 095	0.1 seconds	up
N200 (maximum number of retransmissions)	4	1	0000bbbb	1 through 15	-	up
N201-U (maximum information field length for U and UI frames)	5	2	00000bbb bbbbbbbb	140 through 1 520	octets	down
N201-I (maximum information field length for I frames)	6	2	00000bbb bbbbbbbb	140 through 1 520	octets	down
mD (I frame buffer size in the downlink direction)	7	2	0bbbbbbb bbbbbbbb	0 through 24 320	16 octets	down
mU (I frame buffer size in the uplink direction)	8	2	0bbbbbbb bbbbbbbb	0 through 24 320	16 octets	down
kD (window size in the downlink direction)	9	1	bbbbbbbb	1 through 255	frames	down
kU (window size in the uplink direction)	10	1	bbbbbbbb	1 through 255	frames	down
Layer-3 Parameters	11	Variable	See GSM 04.65			
Reset	12	0	-	-	-	-
- The Range for N201-U for SAPI~~s~~ 1 ~~and 7~~ is 400~~270~~ through 1 520 octets, and for SAPI 7 270 through 1 520 octets. - All other Types and Ranges are reserved for future versions of this specification. - The length for Layer-3 Parameters shall be set equal to the number of octets received from layer 3.						

Version shall not be negotiated while in ABM.

Reset shall only be negotiated with an XID frame, and only be transmitted in the downlink direction. If Reset is present in an XID frame, then it shall be the first XID parameter in the XID information field.

IOV-UI shall only be negotiated in ADM, and only before ciphering is enabled. IOV-I shall only be negotiated with SABM and UA frames. IOV-UI and IOV-I shall only be transmitted in the downlink direction.

T200, N200, and N201-U can be negotiated in ADM and ABM. The new values of T200 shall only apply to timers set after the negotiation has been completed.

N201-I, mD, mU, kD, and kU can be negotiated to any value in Range in ADM. In ABM, N201-I, mD, mU, kD, and kU can only be negotiated to the same or higher value as previously used.

8.9.5 Maximum number of octets in an information field (N201)

The maximum number of octets in an information field (N201) is an LLC layer parameter. See also subclause 5.4. The default value of N201 for each SAPI is given in Table 2. The minimum value of N201 shall be 140 octets, and the maximum value shall be 1 520 octets.

The value of N201 may be different for I frames and U and UI frames. N201-U is used for U and UI frames, and N201-I is used for I frames.

8.9.8 Maximum number of outstanding I frames (k)

The maximum number (k) of sequentially-numbered I frames that may be outstanding (i.e., unacknowledged) at any given time is an LLC layer parameter that shall not exceed 255. k is also denoted window size. The default values of k are given in Table 2.

The value of k can be different in each direction of transmission. kD is k in the downlink direction, and kU is k in the uplink direction.

8.9.9 LLC layer parameter default values

Table 2: LLC layer parameter default values

LLC Parameter	SAPI 1 GMM	SAPI 3 User Data 1	SAPI 5 User Data 2	SAPI 7 SMS	SAPI 9 User Data 3	SAPI 11 User Data 4
Version	0					
IOV-UI	0					
IOV-I	Note 2	$2^{27} \cdot$ SAPI	$2^{27} \cdot$ SAPI	Note 2	$2^{27} \cdot$ SAPI	$2^{27} \cdot$ SAPI
T200	5 s	5 s	10 s	20 s	20 s	40 s
N200	3	3	3	3	3	3
N201-U	400~~270~~	500	500	270	500	500
N201-I	Note 2	1 520	1 520	Note 2	1 520	1 520
mD	Note 2	1 520	760	Note 2	380	190
mU	Note 2	1 520	760	Note 2	380	190
kD	Note 2	16	8	Note 2	4	2
kU	Note 2	16	8	Note 2	4	2
NOTE 1: Proper LLC operation requires that timer T200 be greater than the maximum time between transmission of command frames and the reception of their corresponding response or acknowledgement frames.						
NOTE 2: This parameter applies to ABM procedures. ABM operation is not allowed for GMM and SMS that use only UI frames for information transfer.						
NOTE 3: The default values for SAPIs 3, 5, 9, and 11 have been chosen to correspond with the four GPRS quality of service delay classes, see GSM 02.60. However, there is no fixed relationship between SAPI and delay class. The LLC layer parameters for any SAPI can be negotiated to support any QoS profile, see GSM 03.60.						

CHANGE REQUEST No : **A055r1** ·

Technical Specification GSM / UMTS: **GSM 04.64** Version **6.3.0**

Submitted to SMG **#29**   for approval **X**   without presentation ("non-strategic") **X**
list plenary meeting or STC here ↑   for information   with presentation ("strategic")

PT SMG CR cover form. Filename: crf26_3.doc

Proposed change affects: SIM ☐   ME **X**   Network **X**
(at least one should be marked with an X)

Work item: GPRS

Source: Siemens AG and Rapporteur   **Date:**   23.03.1999

Subject: Discarding outstanding LL-DATA-REQ in the case of LLC re-establishment

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

Reason for change: It is important that in the case of LLC layer re-establishment the LLEs discard all outstanding LL-DATA-REQ primitives in addition to discard all queued I frames. This avoids duplicate transmission of L3-PDUs in the case where an LL-ESTABLISH-IND (as a result of LLC layer re-establishment) collides with a DATA-REQ primitive.

Clauses affected: 8.7.2

Other specs affected: Other releases of same spec   ☐   → List of CRs:
    Other core specifications   ☐   → List of CRs:
    MS test specifications / TBRs   ☐   → List of CRs:
    BSS test specifications   ☐   → List of CRs:
    O&M specifications   ☐   → List of CRs:

Other comments:

8.7 Re-establishment of ABM operation

8.7.1 Criteria for re-establishment

The criteria for re-establishing the ABM mode of operation are defined in this clause by the following conditions:

- the receipt, while in the ABM state, of a SABM;

- the receipt of an LL-ESTABLISH-REQ primitive from layer 3 (see subclause 8.5.1.1);

- the occurrence of N200 retransmission failures (see subclauses 8.6.4 and 8.6.6);

- the occurrence of a frame rejection condition as identified in subclause 8.8.2;

- the receipt of a FRMR response frame (see subclause 8.8.3) while in ABM state; and

- the receipt of an unsolicited DM response with the F bit set to 0 (see subclause 8.8.4) while in ABM state.

8.7.2 Procedures

In all re-establishment situations, the LLE shall follow the procedures defined in subclause 8.5.1. All locally-generated conditions for re-establishment shall cause the transmission of the SABM.

In the case of LLC layer and peer-initiated re-establishment, the LLE shall issue an LL-ESTABLISH-IND primitive to layer 3 and discard all outstanding LL-DATA-REQ primitives and all queued I frames, and LLME shall issue an LLGMM-STATUS-IND primitive to GMM.

In case of layer 3-initiated re-establishment, or if an LL-ESTABLISH-REQ primitive occurs pending re-establishment, the LL-ESTABLISH-CNF primitive shall be used.
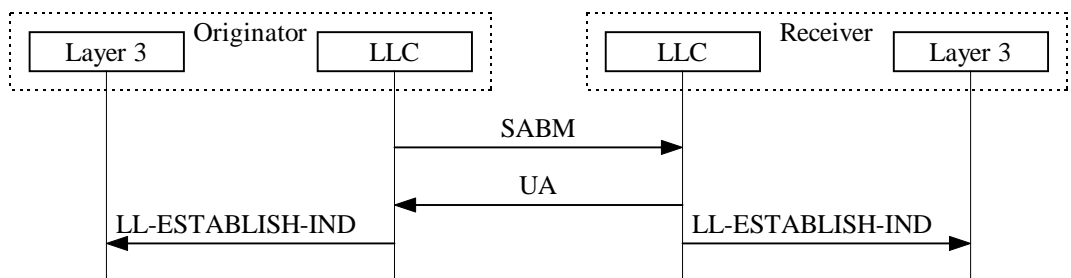

Figure 1: LLC-initiated ABM re-establishment procedure