3GPP TSG_CN **Tdoc NP-000432**
Plenary Meeting #9, Oahu, Hawaii
20th – 22nd September 2000.

Source: **TSG_N WG 1**

Title: **LSes sent from TSG_CN WG1 since TSGN#8**

Agenda item: **6.1**

Document for: **Information**

Introduction:

This document contains Liaison statements which have been agreed by TSG_N WG1 and sent to the corresponding groups, is forwarded to TSG_N Plenary meeting #9 for information.

Tdoc number	Title	WI	Attachments	To	Cc
N1-000971	Response to LS on Support of additional GPRS ciphering algorithms	Security	N1-001028, N1-001029	TSG CN, TSG SA2	TSG SA, TSG S3, TSG N4
N1-000973	UMTS Service Request procedure	GSM/UMTS interworking	N1-001001, N1-001031	TSG-S2	-
N1-000974	Reply to LS from SA4 (000327R) on codec types for different access technologies	OoBTC	N1-001005	SA4/SMG11	CN4(TrFO/TFO RAN3
N1-000978	Response to "LS on RAB Assignment QoS Negotiation" from RAN 3	QoS	N1-000837	TSG RAN WG3	TSG SA WG2, TSG CN WG4, TSG S2, TSG T2
N1-000979	Response to LS on 3.1 kHz multimedia calls at 33.6 kbit/s data rate	CS Multimedia	N1-001021	TSG_CN WG3	TSG_T WG2
N1-000980	Answer to the liaison statement on the modified lengths of parameters AUTN and AUTS.	-	-	CN4	-
N1-000997	Answer to Proposal of exchange of the terms “in GSM“ and “in UMTS“	TEI	-	TSG-SA WG1, TSG-SA WG2, TSG-GERAN WG2, TSG-R2	TSG-CN
N1-000998	GPRS Stage 2	GSM / UMTS interworking	-	TSG-S2	TSG-CN
N1-001010	LS on MS Network Capability Conflict	GPRS	N1-001041	TSG-SA WG2, TSG-CN WG4	-
N1-001011	Question about the RRC Flow Id concept	GSM/UMTS interworking	-	TSG-RAN WG2	-

N1-001023	Liaison statement on the introduction of GEA2	Security	-	SA2, TSG CN	CN4, SA3, TSG SA
N1-001027	LS back on Race conditions avoidance	-	-	TSG-CN WG4	TSG-SA WG2
N1-001038	Response to LS on timing between RAB Assignment Response and user data	GSM – UMTS interworking	N1-000592, N1-000832	RAN WG3, SA WG2	RAN WG2
N1-001039	Missing definition of high quality signal	GSM / UMTS interworking	-	TSG-RAN WG2	TSG-RAN WG4
N1-001040	Answer to LS on 2G/3G QoS profiles	QoS	-	SA5	SA2
N1-001044	UE-Triggered Re-Authentication	UE-Triggered Re-Authentication	-	TSG SA WG3	TSG T WG3, TSG RAN WG2
N1-001045	Liaison on Directed Retry in UMTS and Inter-System	GSM / UMTS interworking	N1-000990	TSG-RAN WG3	TSG-SA WG2

3GPP TSG-CN-WG1, Meeting #12
22-26 May, 2000
Oahu/Hawaii, USA

Tdoc N1-000592

TSG-RAN Working Group 3 meeting #11
Sophia Antipolis, France, 28 Feb – 3 Mar, 2000

R3-000887

To: **SA WG2, CN WG 1**

CC:

Source: **TSG RAN WG3**

Title: **LS on timing between RAB Assignment Response and user data**

TSG RAN WG3 would like to have the view from SA2 and CN1 regarding the possibility that user data can be received in SGSN from the RNC prior to receiving the RAB Assignment Response message.

In the normal case of RAB establishment it is assumed that the user plane connection needs to be available only after the completion of the RAB Assignment procedure, i.e. user data will not arrive in the SGSN prior to receiving the RAB Assignment Response message.

In the case of re-establishment of a RAB it is, however, unclear to RAN3 if the SGSN must be prepared to receive uplink user data before the RAB Assignment Response message has been received. RAN3 would thus like to have this clarified.

RAN3 would also like to have it confirmed that no service acceptance message is used in the case of re-establishment of a RAB.

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3GPP-CN1/SMG3WPA Meeting #12
Oahu/Hawaii, USA. 22-26 May, 2000

***Document* N1-000722**
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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

24.008	CR	211r1	Current Version:	3.3.1

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

For submission to: TSGN#8 *list expected approval meeting # here ↑*	for approval	X	strategic		*(for SMG use only)*
	for information		non-strategic		

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

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

Source: Motorola, Ericsson **Date:** May 25, 2000

Subject: Addition of PFC Feature and Extended GEA in MS Network Capability IE

Work item: QoS & GSM/UMTS Interoperability

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

Reason for change:

1) Stage 3 work has been completed in SMG2 WPA for BSS Involvement in QoS. In order for the MS to receive an SGSN-assigned PFI in the Activate PDP Context Accept message, the MS shall set a "PFC feature" indicator in the MS Network Capabilities IE in the GMM Attach Request. For this reason, the CR proposes the *addition of a PFC Feature indicator in the Network Capabilities IE*.

In addition, the CR proposes to *add support for more GPRS Encryption Algorithms.* This is in line with SA3/SMG10 that suggest the MS Network Capability IE to be extended by a another octet and the additional bits to be used to indicate the capability to support GEA/2, …, GEA/7 (see Tdoc N1-000690). Note that the GEA II ciphering algorithm has already been approved by SMG to be mandatory in R'99 starting after 31st of December 2002.

The proposed additions would increase the total length of the Network Capabilities IE from 3 to 4 octets.

2) During inter-SGSN RAU's the MS Network Capability IE is transferred to another SGSN in the MM Context IE of the SGSN Context Response message (see 3G TS 29.060). Given the different lengths of the MS Network Capability IE expected by 2G- and 3G-SGSN's this may result to incompatibility problems. Consider for instance the case where an MS is attached to a 3G-SGSN and then roams into an area controlled by a 2G-SGSN. The 2G-SGSN will receive the MS Network Capability IE from the 3G-SGSN and it *may* discard the octets after the 3rd since it cannot process them. If afterwards the MS roams again into an area controlled by a 3G-SGSN, the latter will receive the MS Network Capability IE from the 2G-SGSN but with some octets missing. Hence the new features supported by the missing octets will not be visible to the new 3G-SGSN. This can be characterized as a GSM/UMTS Interoperability problem. It must be noted that this problem may be encountered in the future for other IE's as well.

To resolve this problem the CR proposes to include the MS Network Capability IE in the RAU message.

Clauses affected:	9.4.1, 9.4.14, 10.5.5.3, 10.5.5.12			
Other specs affected:	Other 3G core specifications	X	→ List of CRs:	
	Other GSM core specifications		→ List of CRs:	
	MS test specifications		→ List of CRs:	
	BSS test specifications		→ List of CRs:	
	O&M specifications		→ List of CRs:	
Other comments:	Note that a PFC_FEATURE_MODE indicator (see GSM 04.60 section 12.24 “GPRS Cell Options”) is specified in the system information to indicate to R99 MSs that the PFC feature is supported by the network and therefore the R99 MS may initiate PFC procedures in the uplink direction by including a PFI in TBF establishment procedures.			

help.doc

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

9.4 GPRS Mobility Management Messages

9.4.1 Attach request

This message is sent by the MS to the network in order to perform a GPRS or combined GPRS attach. See table 9.4.1/TS 24.008.

Message type: ATTACH REQUEST

Significance: dual

Direction: MS to network

Table 9.4.1/TS 24.008: ATTACH 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	½
	Attach request message identity	Message type 10.4	M	V	1
	MS network capability	MS network capability 10.5.5.12	M	LV	~~2~~3-9
	Attach type	Attach type 10.5.5.2	M	V	½
	GPRS ciphering key sequence number	Ciphering key sequence number 10.5.1.2	M	V	½
	DRX parameter	DRX parameter 10.5.5.6	M	V	2
	P-TMSI or IMSI	Mobile identity 10.5.1.4	M	LV	6 - 9
	Old routing area identification	Routing area identification 10.5.5.15	M	V	6
	MS Radio Access capability	MS Radio Access capability 10.5.5.12a	M	LV	6 - 52
19	Old P-TMSI signature	P-TMSI signature 10.5.5.8	O	TV	4
17	Requested READY timer value	GPRS Timer 10.5.7.3	O	TV	2
9-	TMSI status	TMSI status 10.5.5.4	O	TV	1

9.4.1.1 Old P-TMSI signature

This IE is included if a valid P-TMSI and P-TMSI signature are stored in the MS.

9.4.1.2 Requested READY timer value

This IE may be included if the MS wants to indicate a preferred value for the READY timer.

9.4.1.3 TMSI status

This IE shall be included if the MS performs a combined GPRS attach and no valid TMSI is available.

********** Next Modification **********

9.4.14 Routing area update request

This message is sent by the MS to the network either to request an update of its location file or to request an IMSI attach for non-GPRS services. See table 9.4.14/TS 24.008.

Message type: ROUTING AREA UPDATE REQUEST

Significance: dual

Direction: MS to network

Table 9.4.14/TS 24.008: ROUTING AREA UPDATE 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
	Routing area update request message identity	Message type 10.4	M	V	1
	Update type	Update type 10.5.5.18	M	V	1/2
	GPRS ciphering key sequence number	Ciphering key sequence number 10.5.1.2	M	V	1/2
	Old routing area identification	Routing area identification 10.5.5.15	M	V	6
	MS Radio Access capability	MS Radio Access capability 10.5.5.12a	M	LV	6 - 52
19	Old P-TMSI signature	P-TMSI signature 10.5.5.8	O	TV	4
17	Requested READY timer value	GPRS Timer 10.5.7.3	O	TV	2
27	DRX parameter	DRX parameter 10.5.5.6	O	TV	3
9-	TMSI status	TMSI status 10.5.5.4	O	TV	1
18	P-TMSI	Mobile identity 10.5.1.4	O	TLV	7
31	MS network capability	MS network capability 10.5.5.12	~~O~~O	TLV	~~3~~4-~~9~~10

9.4.14.1 Old P-TMSI signature

This IE is included by the MS if it was received from the network in an ATTACH ACCEPT or ROUTING AREA UPDATE ACCEPT message.

9.4.14.2 Requested READY timer value

This IE may be included if the MS wants to indicate a preferred value for the READY timer.

9.4.14.3 DRX parameter

This IE may be included if the MS wants to indicate new DRX parameters.

9.4.14.4 TMSI status

This IE shall be included if the MS performs a combined routing area update and no valid TMSI is available.

9.4.14.5 P-TMSI (UMTS only)

This IE shall be included by the MS.

9.4.14.x MS network capability

This IE shall be included by the MS to indicate it's capabilities to the network.

********** Next Modification **********

10.5.5.3 Ciphering algorithm

The purpose of the *ciphering algorithm* information element is to specify which ciphering algorithm shall be used.

The *ciphering algorithm* is a type 1 information element.

The *ciphering algorithm* information element is coded as shown in figure 10.5.119/TS 24.008 and table 10.5.136/TS 24.008.

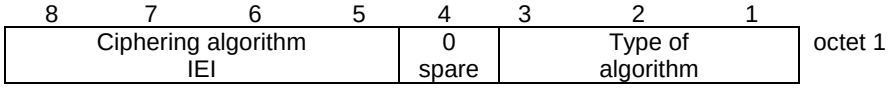

Figure 10.5.119/TS 24.008: *Ciphering algorithm* information element

Table 10.5.136/TS 24.008: *Ciphering algorithm* information element

Type of ciphering algorithm (octet 1)			
Bits			
3	**2**	**1**	
0	0	0	ciphering not used
0	0	1	GPRS Encryption Algorithm GEA/1
0	1	0	GPRS Encryption Algorithm GEA/2
0	1	1	GPRS Encryption Algorithm GEA/3
1	0	0	GPRS Encryption Algorithm GEA/4
1	0	1	GPRS Encryption Algorithm GEA/5
1	1	0	GPRS Encryption Algorithm GEA/6
1	1	1	GPRS Encryption Algorithm GEA/7

~~All other values are interpreted *reserved* by this version of the protocol.~~

********** Next Modification **********

10.5.5.12 MS network capability

The purpose of the *MS network capability* information element is to provide the network with information concerning aspects of the mobile station related to GPRS. The contents might affect the manner in which the network handles the operation of the mobile station. The *MS network capability* information indicates general mobile station characteristics and it shall therefore, except for fields explicitly indicated, be independent of the frequency band of the channel it is sent on.

The *MS network capability* is a type 4 information element with a maximum of ~~3~~ 10 octets length.

The value part of a *MS network capability* information element is coded as shown in figure 10.5.128/TS 24.008 and table 10.5.145/TS 24.008.

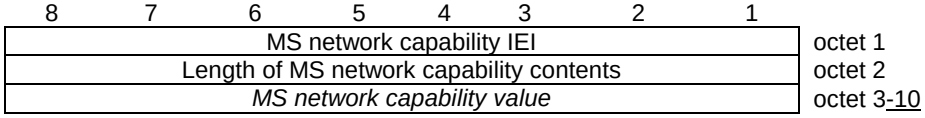

Figure 10.5.128/TS 24.008 MS network capability information element

Table 10.5.145/TS 24.008 *MS network capability* information element

<MS network capability value part> ::=

<**GEA1 bits**>
<**SM capabilities via dedicated channels**: bit>
<**SM capabilities via GPRS channels**: bit>
<**UCS2 support**: bit>
<**SS Screening Indicator**: bit string(2)>
<SoLSA Capability : bit>
<Revision level indicator: bit>
<PFC feature mode: bit>
<Extended GEA bits>
<Spare bits>;

<**GEA1 bits**> ::= < **GEA/1** :bit>;

<Extended GEA bits> ::= <GEA/2:bit><GEA/3:bit>< GEA/4:bit >< GEA/5:bit >< GEA/6:bit ><GEA/7:bit>;

<**Spare bits**> ::= null | {<spare bit> < **Spare bits** >};

SS Screening Indicator

0 0 defined in TS 24.080

0 1 defined in TS 24.080
1 0 defined in TS 24.080
1 1 defined in TS 24.080

SM capabilities via dedicated channels

0 Mobile station does not support mobile terminated point to point SMS via dedicated signalling channels
1 Mobile station supports mobile terminated point to point SMS via dedicated signalling channels

SM capabilities via GPRS channels

0 Mobile station does not support mobile terminated point to point SMS via GPRS packet data channels
1 Mobile station supports mobile terminated point to point SMS via GPRS packet data channels

UCS2 support

This information field indicates the likely treatment by the mobile station of UCS2 encoded character strings.

0 the ME has a preference for the default alphabet (defined in GSM 03.38) over UCS2.
1 the ME has no preference between the use of the default alphabet and the use of UCS2.

GPRS Encryption Algorithm GEA/1

0 encryption algorithm **GEA/1**not available
1 encryption algorithm **GEA/1** available

SoLSA Capability

0 The ME does not support SoLSA.
1 The ME supports SoLSA.

Revision level indicator

0 used by a mobile station supporting earlier versions of the protocol
1 used by a mobile station supporting this version of the protocol

PFC feature mode

0 Mobile station does not support BSS packet flow procedures
1 Mobile station does support BSS packet flow procedures

GEA/2

0 encryption algorithm GEA/2 not available
1 encryption algorithm GEA/2 available

GEA/3

0 encryption algorithm GEA/3 not available

1 encryption algorithm GEA/3 available

GEA/4

0 encryption algorithm GEA/4 not available
1 encryption algorithm GEA/4 available

GEA/5

0 encryption algorithm GEA/5 not available
1 encryption algorithm GEA/5 available

GEA/6

0 encryption algorithm GEA/6 not available
1 encryption algorithm GEA/6 available

GEA/7

0 encryption algorithm GEA/7 not available
1 encryption algorithm GEA/7 available

3GPP-CN1 Meeting #13
Vancouver/Canada, 14-18 August 2000

Document N1-000873
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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43.068	CR	001	Current Version:	4.0.0

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

For submission to: CN#9					
list expected approval meeting # here ↑	for approval	X	strategic		*(for SMG use only)*
	for information		non-strategic		

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

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

Source: Nortel Networks **Date:** 7 August 2000

Subject: Uplink Release dataFlow correction

Work item: ASCI

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

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

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	
Release 00	X

Reason for change: Wrong procedure description which can lead to interworking problem

Clauses affected: 11.3.8, 11.4, 11.5

Other specs affected:

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

Other comments: UPLINK RELEASE INDICATION direction is only from BSS to MSC (see 08.08)

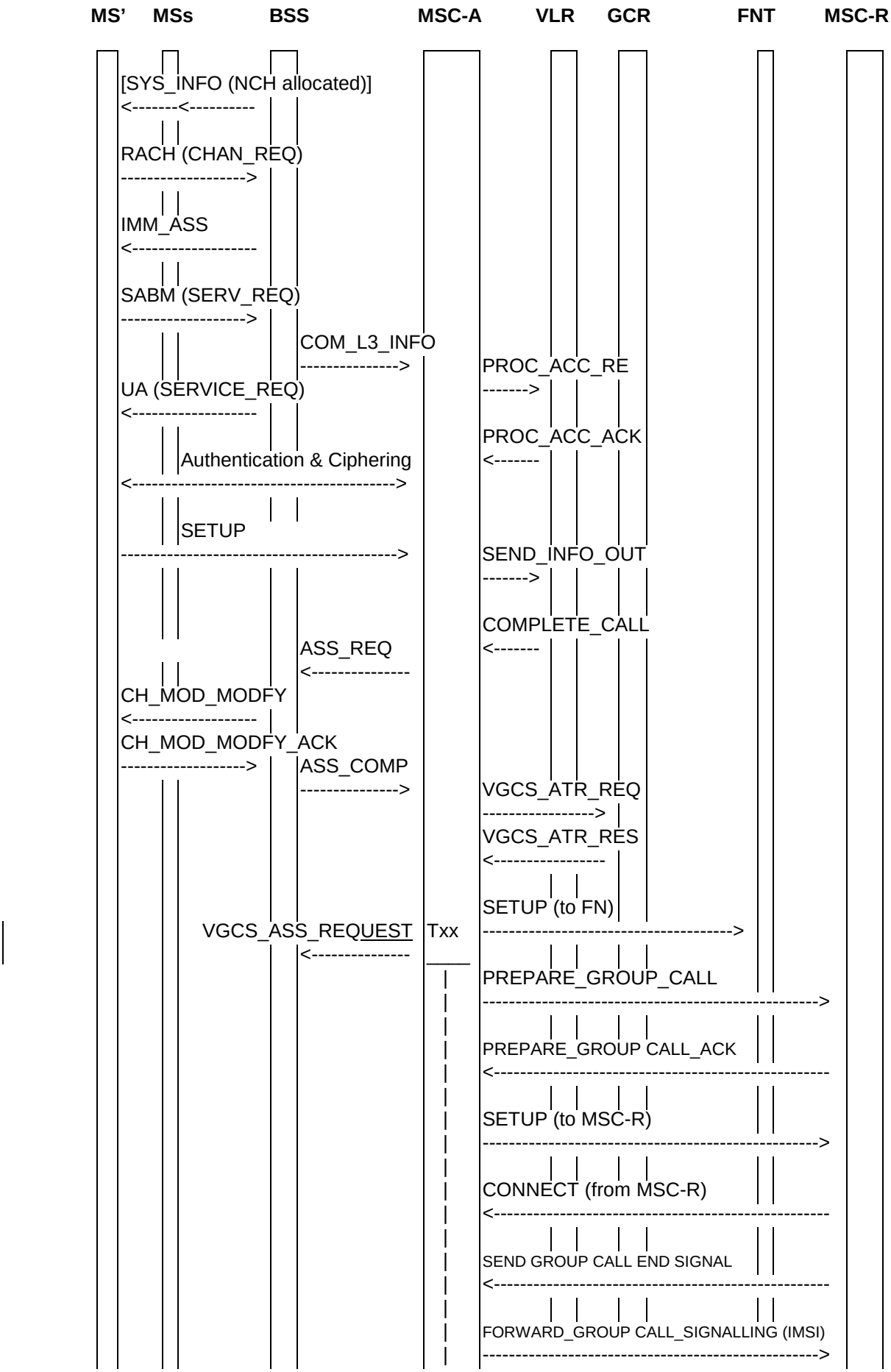
help.doc

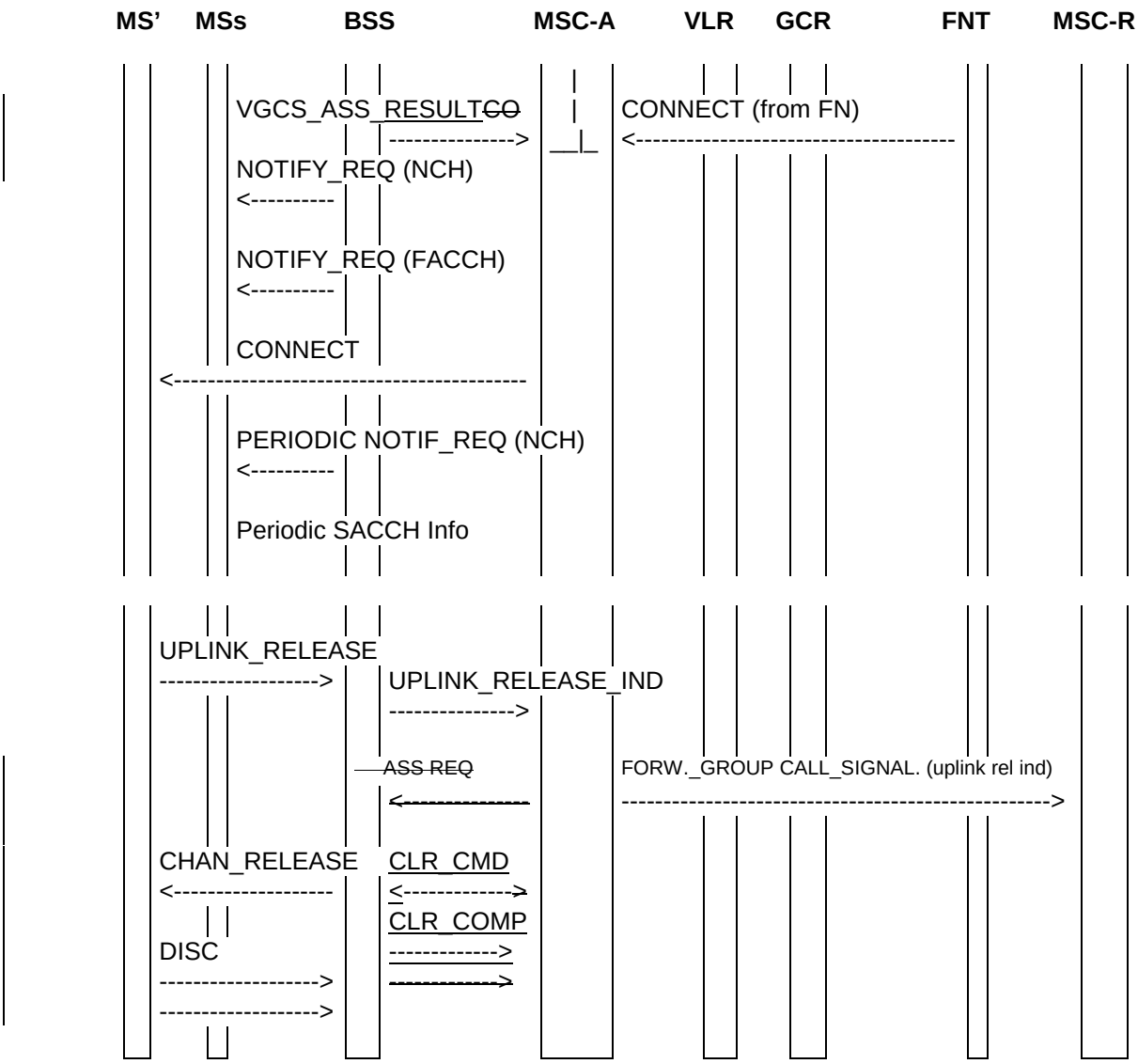
<--------- double-click here for help and instructions on how to create a CR.

11.3.8 Overview of signalling

In this overview, the messages required to implement the specified concept are identified, and brief details are given of each message.

A diagrammatic representation of the voice group call message structure proposed and actions required is given in figures 2 to 7a.


MS'
MSs
BSS
MSC-A
VLR
GCR
FNT
MSC-R
[SYS_INFO (NCH allocated)]
RACH (CHAN_REQ)
IMM_ASS
SABM (SERV_REQ)
COM_L3_INFO
PROC_ACC_RE
UA (SERVICE_REQ)
PROC_ACC_ACK
Authentication & Ciphering
SETUP
SEND_INFO_OUT
COMPLETE_CALL
ASS_REQ
CH_MOD_MODFY
CH_MOD_MODFY_ACK
ASS_COMP
VGCS_ATR_REQ
VGCS_ATR_RES
SETUP (to FN)
VGCS_ASS_REQUEST
Txx
PREPARE_GROUP_CALL
PREPARE_GROUP CALL_ACK
SETUP (to MSC-R)
CONNECT (from MSC-R)
SEND GROUP CALL END SIGNAL
FORWARD_GROUP CALL_SIGNALLING (IMSI)



NOTE: MS' = calling subscriber mobile station;
MSs = destination subscriber mobile stations;
FNT = fixed network user terminal;
MSC-A = anchor MSC;
MSC-R = relay MSC

Figure 2: Signalling information required for establishing voice group calls by a service subscriber roaming in the anchor MSC area

SYS_INFO (NCH allocated): Message used to indicate if the NCH is allocated on the CCCH in the cell.

Initial RACH CHAN_REQ: Standard message.

IMM_ASS: Standard message send on the PCH.

SERV_REQ (voice group call): Modified form of the current call request message L3-MM CM SERVICE REQUEST sent on the allocated channel. Teleservice Voice group call is indicated.

UA (SERV_REQ): This message is used to acknowledge the layer 2 link and provide contention resolution of the service request.

COM_L3_INFO: The MSC is provided with initial information about the voice group call.

NOTE 2: Messages flows for authentication and ciphering are not represented although performed as normal.

PROC_ACC_REQ: The MAP_PROCESS_ACC_REQ message is sent to the VLR to check the requested VGCS teleservice against the subscription data.

PROC_ACC_ACK: The MAP_PROCESS_ACC_ACK message acknowledges the requested service.

Authentication and Ciphering: Authentication and Ciphering may be performed. Acknowledgement of the service request can also be performed by sending the CM SERVICE ACCEPT.

SETUP: The MSC is provided with details about the voice group call.

NOTE 3: Alternatively, an IMMEDIATE_SETUP may have been send as the initial message including all details of the voice group call. In this case no SETUP message must be sent.

SEND_INFO_OUT: The requested group ID is transferred to the VLR in the MAP_SEND_INFO_FOR_OUTGOING_CALL message.

COMPLETE_CALL: The VLR returns the MAP_COMPLETE_CALL message confirming the use of the requested group ID.

ASSIGNMENT_REQUEST: Standard message.

CHAN_MOD_MODFY: Standard message to modify the channel mode in case of very early assignment.

CHAN_MOD_MODFY_ACK: Standard message to acknowledge the modification of the channel mode.

ASSIGNMENT_COMPLETE: Standard message.

NOTE 4: Alternatively, early assignment or OACSU procedures might be applied with the corresponding assignment messages not presented in figure 2.

VGCS_ATR_REQ: The group call attributes are requested from the GCR.

VGCS_ATR_RES: The requested information is returned from the GCR.

VGCS_ASSIGNMENT_REQ: This message is sent from the MSC to all affected BSCs, [including the group call reference, the channel type and possibly the call priority and details on the ciphering.

NOTE 5: As an operator option the voice group call channels, the links to them and optionally also the links to dispatchers can already be established and permanently reserved in order to speed up the call set-up for emergency voice group calls.

VGCS_ASSIGNMENT RESULT~~COMPLETE~~: Acknowledgement message from the affected BSC in answer to the assignment requests. If the assignment is not successful, a VGCS_ASSIGNMENT_FAILURE message shall be sent instead.

SETUP to fixed network users: Based on the information determined about the users of external networks to be involved in the call, the MSC shall initiate calls to these users in the normal manner, depending on their mode of connection into the MSC, and shall connect them into the conference bridge. Alternatively normal calls to GSM subscribers may be established for dispatchers being GSM subscribers which is not presented in the diagram.

PREPARE_GROUP CALL: The group call attributes are sent to every relay MSC and a Group Call number for call set-up to is requested.

PREPARE_GROUP CALL ACK: The Group Call number for call set-up is returned to the anchor MSC.

SETUP to MSC-R: The ISUP connection is set-up to the relay MSC.

CONNECT from MSC-R: Set-up of the ISUP connection to the relay MSC is confirmed.

SEND_GROUP CALL_END_SIGNAL: Indicates to the anchor MSC that conversation can start.

FORWARD_GROUP CALL_SIGNALLING (IMSI): The IMSI of the service subscriber who has established the voice group call and who is allowed to terminate the call is sent to every relay MSC.

Txx: Timer implemented in the MSC which is started with the incoming VGCS SETUP message and stops with the outgoing paging message. If the timer expires before the MSC receives all of the expected CHAN_REQ_ACK from the BSCs and the CONNECT messages from the external networks and SEND_GROUP CALL_END_SIGNALs from the relay MSCs, the VGCS shall be established by the MSC to all available parts of the group call area.

NOTIF_REQ (NCH): Messages for notification which contain the group call reference, the priority of the call if eMLPP is applied, and possibly the channel description of the voice group call channel to which the mobile stations shall listen and the number of the group key used for ciphering.

NOTIF_REQ (FACCH): Message for notification sent on the FACCH to the mobile stations currently involved in other calls. The notification on the FACCH shall include the group call reference, and the priority level and may also include the channel description and the group ciphering key numbers.

Periodic NOTIF_REQ (NCH): The notifications are sent periodically so that mobile stations moving into the area can join the voice group call.

Periodic SACCH Info: Periodic messages sent on SACCH. This message may include:

- information of changes of notifications;
- information used for cell re-selection.

CONNECT: Information to the mobile station of the calling subscriber that the VGCS is established with the related group call reference as the connected number.

UPLINK_RELEASE: When the calling service subscriber wants to become a listening service subscriber for the first time, a message indicating release of the uplink is required to be sent from the MS to the BSS in order to set the uplink free.

UPLINK_RELEASE_INDICATION: The BSS informs the MSC on the uplink release.

FORWARD_GROUP CALL_SIGNALLING (uplink release indication): This message is sent to every relay MSC to indicate that the uplink is free.

CLEAR COMMAND : The MSC requests the BSS to clear radio and terrestrial resources associated with originator dedicated link if not already done.

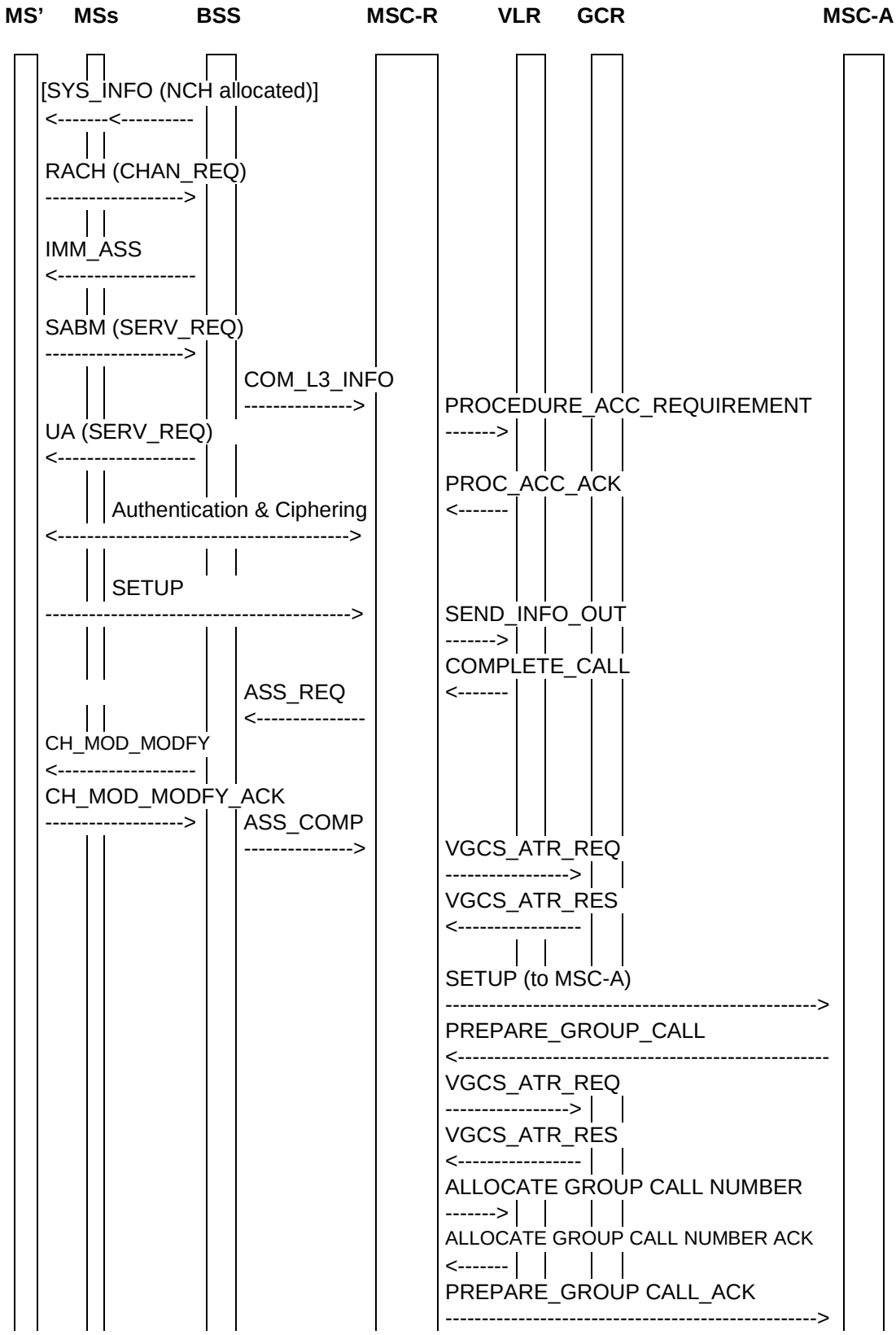
~~**ASSIGNMENT REQUEST:** The MSC requests the BSC to assign the mobile to a Group call channel to the calling service subscriber. The ASSIGNMENT REQUEST shall contain the group call reference.~~

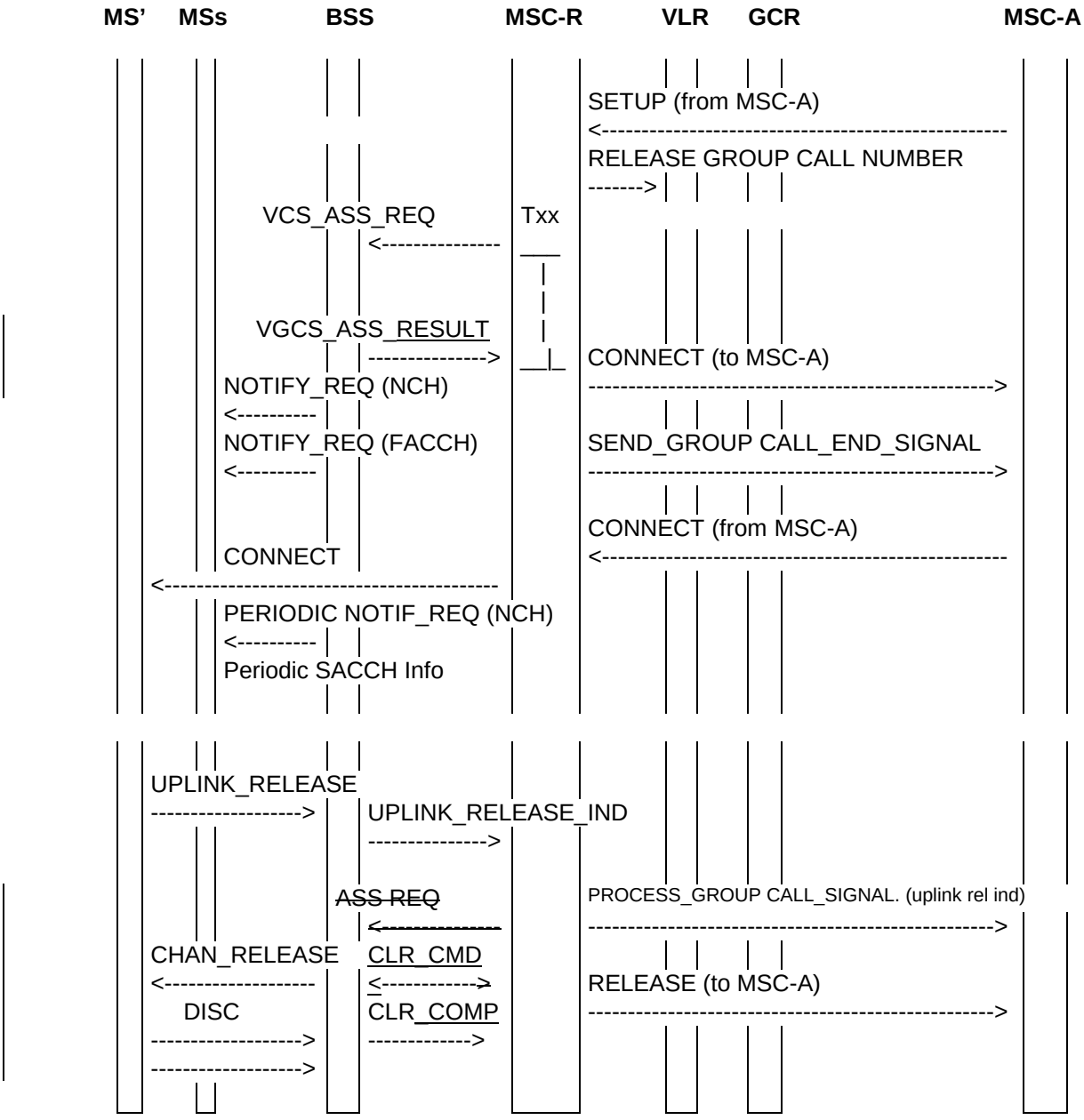
CHAN_RELEASE: The BSS sends a channel release message to the calling service subscriber's mobile station including the channel description of the voice group call channel to which the mobile station shall tune to.

ASSIGNMENT COMPLETE and CLR_REQ: When the MS moves the Group call channel the BSS sends the ASSIGNMENT CMPLETE and then the CLR REQ.

NOTE 6: Alternatively, if no UPLINK_RELEASE has been sent to the network by the mobile station, the network may transfer the mobile station to the voice group call channel by the channel mode modify procedure or by an assignment procedure or by a handover procedure.

DISC: Two layer 2 disconnect messages shall be sent by the mobile station to the network.


MS'
MSs
BSS
MSC-R
VLR
GCR
MSC-A
[SYS_INFO (NCH allocated)]
RACH (CHAN_REQ)
IMM_ASS
SABM (SERV_REQ)
COM_L3_INFO
PROCEDURE_ACC_REQUIREMENT
UA (SERV_REQ)
PROC_ACC_ACK
Authentication & Ciphering
SETUP
SEND_INFO_OUT
COMPLETE_CALL
ASS_REQ
CH_MOD_MODFY
CH_MOD_MODFY_ACK
ASS_COMP
VGCS_ATR_REQ
VGCS_ATR_RES
SETUP (to MSC-A)
PREPARE_GROUP_CALL
VGCS_ATR_REQ
VGCS_ATR_RES
ALLOCATE GROUP CALL NUMBER
ALLOCATE GROUP CALL NUMBER ACK
PREPARE_GROUP CALL_ACK



NOTE: MS' = calling subscriber mobile station;
MSs = destination subscriber mobile stations;
MSC-A = anchor MSC;
MSC-R = relay MSC

Figure 3: Signalling information required for establishing voice group calls by a service subscriber roaming in the relay MSC area

SYS_INFO (NCH allocated): Message used to indicate if the NCH is allocated on the CCCH in the cell.

Initial RACH CHAN_REQ: Standard message.

IMM_ASS: Standard message send on the PCH.

SERV_REQ (voice group call): Modified form of the current call request message L3-MM CM SERVICE REQUEST sent on the allocated channel. Teleservice Voice group call is indicated.

UA (SERV_REQ): This message is used to acknowledge the layer 2 link and provide contention resolution of the service request.

COM_L3_INFO: The MSC is provided with initial information about the voice group call.

NOTE 1: Messages flows for authentication and ciphering are not represented although performed as normal.

PROC_ACC_REQ: The MAP_PROCESS_ACC_REQ message is sent to the VLR to check the requested VGCS teleservice against the subscription data.

PROC_ACC_ACK: The MAP_PROCESS_ACC_ACK message acknowledges the requested service.

Authentication & Ciphering: Authentication and Ciphering may be performed. Acknowledgement of the service request can also be performed by sending the CM SERVICE ACCEPT.

SETUP: The MSC is provided with details about the voice group call.

NOTE 2: Alternatively, an IMMEDIATE_SETUP may have been send as the initial message including all details of the voice group call. In this case no SETUP message must be sent.

SEND_INFO_OUT: The requested group ID is transferred to the VLR in the MAP_SEND_INFO_FOR_OUTGOING_CALL message.

COMPLETE_CALL: The VLR returns the MAP_COMPLETE_CALL message confirming the use of the requested group ID.

ASSIGNMENT_REQUEST: Standard message.

CHAN_MOD_MODFY: Standard message to modify the channel mode in case of very early assignment.

CHAN_MOD_MODFY_ACK: Standard message to acknowledge the modification of the channel mode.

ASSIGNMENT_COMPLETE: Standard message.

NOTE 3: Alternatively, early assignment or OACSU procedures might be applied with the corresponding assignment messages not presented in figure 3.

VGCS_ATR_REQ: The group call attributes are requested from the GCR.

VGCS_ATR_RES: The requested information (MSC-A address) is returned from the GCR.

SETUP to MSC-A: Based on information received from the GCR the relay MSC shall set-up a dedicated connection for the initiating service subscriber to the anchor MSC.

PREPARE_GROUP CALL: The group call attributes (parts) are received from the anchor MSC.

VGCS_ATR_REQ: The group call attributes are requested from the GCR.

VGCS_ATR_RES: The requested information (cell list) is returned from the GCR.

ALLOCATE GROUP CALL NUMBER: The Group Call number is requested from the VLR.

ALLOCATE GROUP CALL NUMBER ACK: The Group Call number is returned from the VLR.

PREPARE_GROUP_CALL_ACK: The Group Call number is sent to MSC-A.

SETUP from MSC-A: The ISUP connection is set-up between MSC-A and MSC-R.

RELEASE GROUP CALL NUMBER: The VLR is requested to release the Group Call number.

VGCS_ASSIGNMENT_REQ: This message is sent from the MSC to all affected BSCs, [one dedicated message for every requested channel in a cell,] including the group call reference, the channel type and possibly the call priority and details on the ciphering.

NOTE 4: As an operator option the voice group call channels, the links to them and optionally also the links to dispatchers can already be established and permanently reserved in order to speed up the call set-up for emergency voice group calls.

VGCS_ASSIGNMENT RESULT~~**COMPLETE**~~: Acknowledgement message from the affected BSC in answer to the assignment requests. If the assignment is not successful, a VGCS_ASSIGNMENT_FAILURE message shall be sent instead.

CONNECT to MSC-A: Set-up of the ISUP connection from the anchor MSC is confirmed.

SEND_GROUP CALL_END_SIGNAL: Indicates to the anchor MSC that conversation can start. In addition the IMSI of service subscriber who has established the voice group call and who is allowed to terminate the call is included.

Txx: Timer implemented in the relay MSC which is started with the incoming SETUP message from the anchor MSC and stops with the outgoing paging message. If the timer expires before the MSC receives all of the expected CHAN_REQ_ACK from the BSCs, the VGCS shall be established by the relay MSC to all available parts of the group call area and the anchor MSC shall be informed that conversation can start.

NOTIF_REQ (NCH): Messages for notification which contain the group call reference, the priority of the call if eMLPP is applied, and possibly the channel description of the voice group call channel to which the mobile stations shall listen and the number of the group key used for ciphering.

NOTIF_REQ (FACCH): Message for notification sent on the FACCH to the mobile stations currently involved in other calls. The notification on the FACCH shall include the group call reference, and the priority level and may include also the channel description and the group ciphering key numbers.

Periodic NOTIF_REQ (NCH): The notifications are sent periodically so that mobile stations moving into the area can join the voice group call.

Periodic SACCH Info: Periodic messages sent on the downlink of the SACCH informing mobile stations of:

- information of changes of notifications;
- information used for cell re-selection.

CONNECT (from MSC-A): Call set-up of the dedicated connection for the calling service subscriber is confirmed.

CONNECT: Information to the mobile station of the calling subscriber that the VGCS is established with the related group call reference as the connected number.

UPLINK_RELEASE: When the calling service subscriber wants to become a listening service subscriber for the first time, a message indicating release of the uplink is required to be sent from the MS to the BSS in order to set the uplink free.

UPLINK_RELEASE_INDICATION: The BSS informs the MSC on the uplink release.

PROCESS_GROUP CALL_SIGNALLING (uplink release indication): To indicate to the anchor MSC that the uplink is free.

CLEAR COMMAND : The MSC requests the BSS to clear radio and terrestrial resources associated with originator dedicated link if not already done.

~~**ASSIGNMENT_REQUEST**: The MSC requests the BSC to assign a Group call channel to the calling service subscriber. The ASSIGNMENT_REQUEST shall contain the group call reference.~~

CHAN_RELEASE: The BSS sends a channel release message to the calling service subscriber's mobile station including the channel description of the voice group call channel to which the mobile station shall tune to.

~~**ASSIGNMENT_COMPLETE & CLR_REQ**: When the MS moves the Group call channel the BSS sends the ASSIGNMENT COMPLETE and then the CLR REQ.~~

NOTE 5: Alternatively, if no UPLINK_RELEASE has been sent to the network by the mobile station, the network may transfer the mobile station to the voice group call channel by the channel mode modify procedure or by an assignment procedure or by a handover procedure.

DISC: Two layer 2 disconnect messages shall be sent by the mobile station to the network.

RELEASE to MSC-A: The dedicated connection for the initiating service subscriber is released.

11.4 Functional requirement of Anchor MSC

The VGCS handling process in the anchor MSC is shown in figure 8.

Successful call set-up

When the VGCS handling process in the anchor MSC receives a VGCS call set-up request from either a dispatcher or a service subscriber currently located in the anchor MSC's area or a service subscriber currently located in a relay MSC's area, it interrogates its associated GCR to retrieve the group call attributes, and waits for a response.

If the GCR returns a positive response containing the group call attributes, the anchor MSC sets up the downlinks to the cells inside the MSC area of the group call anchor MSC into which the call is to be sent, sets up the connections to the dispatchers to which a dedicated link is to be established, sets up the connections to the relay MSCs into which the call is to be sent, starts the No Activity Timer, sends Forward Group Call Signalling messages containing the IMSI of the service subscriber who has initiated the call -if the call was not initiated by a dispatcher- to all relay MSCs (however not to the relay MSC from which the IMSI was received within the Send Group Call End Signal message if the call was initiated by a service subscriber located in the relay MSC area), and waits for uplink management messages.

Procedure Set-up Connections to Relay MSCs

The procedure is shown in figure 9.

The procedure sends PREPARE_GROUP_CALL messages to all relay MSCs and waits for the responses.

If a positive response containing a Group Call number is received from a relay MSC, the anchor MSC constructs an IAM using the Group Call number as called party address, sends it to the relay MSC and waits for the SEND_GROUP CALL_END_SIGNAL message.

If the SEND_GROUP CALL_END_SIGNAL message is received, the procedure checks whether responses from other relay MSCs are outstanding. Relay MSCs that do not send positive responses on the PREPARE_GROUP_CALL message are no longer considered to belong to the list of relay MSCs for this VGCS call.

Negative response received from the GCR

If the GCR returns a negative response to the anchor MSC indicating that the call is already on-going, the anchor MSC checks whether the call was initiated by a dispatcher. If so, the dispatcher is connected to the on-going call and the process returns to the idle state. If the call was initiated by a service subscriber, a Release message indicating "user busy" is returned in order to force the mobile station of the service subscriber to look for notifications of the respective group ID on the NCH and join the group call.

If the negative response from the GCR indicates any other reason than "on-going call" the VGCS call set-up request is rejected by sending a release message back to the initiator and the process returns to the idle state.

Uplink management

If the anchor MSC receives an Uplink Release message from a BSC, it marks the uplink as free, sends Forward Group Call Signalling messages indicating "uplink release indication" to all relay MSCs, sends Uplink Release ~~indication~~ command messages to all other BSCs, restarts the No Activity Timer and waits for further uplink management messages.

If the anchor MSC receives an Uplink Request message from a BSC, it checks whether the uplink is marked as free. If so, an Uplink Request Confirm message is returned to the BSC, Forward Group Call Signalling messages indicating that the uplink is no longer free are sent to all relay MSCs, Uplink Seized Command messages are sent to all other BSCs, the uplink is marked busy and the process waits for further uplink management messages. If the uplink was not free when receiving the Uplink Request, the request is rejected.

If the anchor MSC receives an Uplink Cnf message from a BSC, it stores the received data and waits for further uplink management messages.

If the anchor MSC receives a Process Group Call Signalling message from a relay MSC indicating "uplink release indication", it ~~clears the dedicated connection which possibly has been established to the relay MSC,~~ marks the uplink as free, sends Forward Group Call Signalling messages indicating "uplink release indication" to all other relay MSCs, sends Uplink Release ~~indication~~ command messages to all BSCs, restarts the No Activity Timer and waits for further uplink management messages.

If the anchor MSC receives a Process Group Call Signalling message from a relay MSC indicating "uplink request", it checks whether the uplink is marked as free. If so, a Forward Group Call Signalling message indicating "uplink request confirm" is returned to the relay MSC, Forward Group Call Signalling messages indicating that the uplink is no longer free are sent to all other relay MSCs, Uplink Seized Command messages are sent to all BSCs, the uplink is marked busy and the process waits for further uplink management messages. If the uplink was not free when receiving the Process Group Call Signalling message (Uplink Request), the request is rejected.

If the anchor MSC receives an ABORT message from a relay MSC, the connection to the relay MSC is released and the relay MSC is no longer considered to be part of the call.

Call release

If the anchor MSC receives a Release message from an entitled dispatcher or from the initiating service subscriber who currently has access to the uplink, it sends Send Group Call End Signal ACK messages to all relay MSCs, sends Release messages to all relay MSCs, sends Release messages to all dispatchers and BSCs, informs the GCR that the call is no longer on-going and the process returns to the idle state.

If the anchor MSC receives a Process Group Call Signalling message from a relay MSC indicating "release group call", it sends Send Group Call End Signal ACK messages to all relay MSCs, sends Release messages to all relay MSCs, sends Release messages to all dispatchers and BSCs, informs the GCR that the call is no longer on-going and the process returns to the idle state.

If the no activity time in the anchor MSC expires indicating that no voice activity has been detected for the time specified in the GCR, the anchor MSC sends Send Group Call End Signal ACK messages to all relay MSCs, sends Release messages to all relay MSCs, sends Release messages to all dispatchers and BSCs, informs the GCR that the call is no longer on-going and the process returns to the idle state.

11.5 Functional requirement of Relay MSC

The VGCS handling process in the relay MSC is shown in figure 10.

Successful call set-up initiated by a service subscriber

When the VGCS handling process in the relay MSC receives a VGCS call set-up request from a service subscriber currently located in a relay MSC's area, it interrogates its associated GCR to retrieve the anchor MSC address and waits for a response.

If the GCR returns a positive response containing the anchor MSC address, the relay MSC sets up a dedicated connection for the initiating service subscriber to the anchor MSC by constructing an IAM with CLI set to the NDC plus prefix for VGCS plus group call reference, sending it to the anchor MSC, and waits for call release.

Negative response received from the GCR

If the GCR returns a negative response to the relay MSC indicating that the call is already on-going, the relay MSC sends a Release message indicating "user busy" to the service subscriber in order to force the mobile station of the service subscriber to look for notifications of the respective group ID on the NCH and join the group call.

If the negative response from the GCR indicates any other reason than "on-going call" the VGCS call set-up request is rejected by sending a release message back to the initiator and the process returns to the idle state.

Successful call set-up initiated by the anchor MSC

When the VGCS handling process in the relay MSC receives a PREPARE_GROUP_CALL message from the anchor MSC, it interrogates its associated GCR to retrieve the list of cells inside the relay MSC area into which the call is to be sent.

If the GCR returns a positive response, the relay MSC requests an Group Call number from its VLR.

If the VLR returns an Group Call number, a PREPARE_GROUP CALL acknowledgement containing the Group Call number is returned to the anchor MSC and the relay MSC waits for the incoming call.

If the incoming call identified by the Group Call number is received, the relay MSC releases the Group Call number, sets up the downlinks to the cells inside the relay MSC area into which the call is to be sent, sends a SEND_GROUP CALL END_SIGNAL message to the anchor MSC and waits for uplink management messages.

Negative response received from the GCR

If the GCR returns a negative response to the relay MSC, the relay MSC returns a PREPARE_GROUP_CALL negative response to the anchor MSC and returns to the idle state.

No Group Call number received from VLR

If the VLR could not allocate a Group Call number, the relay MSC returns a PREPARE_GROUP CALL_CALL negative response to the anchor MSC, informs the GCR that the call is no longer on-going and returns to the idle state.

Uplink management

If the relay MSC receives an Uplink Release message from a BSC, it marks the uplink as free, sends a Process Group Call Signalling message indicating "uplink release indication" to the anchor MSC, sends Uplink Release ~~indication~~ command messages to all other BSCs, releases the dedicated connection to the anchor MSC which possibly has been established and waits for further uplink management messages.

If the relay MSC receives an Uplink Request message from a BSC, it checks whether the uplink is marked as free. If so, a Process Group Call Signalling message indicating "uplink request" is sent to the anchor

MSC, Uplink Seized Command messages are sent to all other BSCs, the uplink is marked busy and the process waits for further uplink management messages. If the uplink was not free when receiving the Uplink Request, the request is rejected.

If the relay MSC receives an Uplink Cnf message from a BSC, it stores the data and waits for further uplink management messages.

If the relay MSC receives a Forward Group Call Signalling message from a anchor MSC indicating "uplink release indication", it marks the uplink as free, sends Uplink Release ~~indication~~ command messages to all BSCs and waits for further uplink management messages.

If the relay MSC receives a Forward Group Call Signalling message from a anchor MSC indicating "uplink seized command", it marks the uplink as busy, sends Uplink Seized Command messages to all BSCs and waits for further uplink management messages.

If the relay MSC receives a Forward Group Call Signalling message from an anchor MSC indicating "uplink reject", it returns an Uplink Reject message to the BSC which has requested the uplink and waits for further uplink management messages.

If the relay MSC receives a Forward Group Call Signalling message from an anchor MSC indicating "uplink request confirm", it returns an Uplink Request Confirm message to the BSC which has requested the uplink, sets up a dedicated connection for the new talker to the anchor MSC (implementation option) and waits for further uplink management messages.

If the relay MSC receives a Forward Group Call Signalling message from an anchor MSC indicating "uplink release command", it sends an Uplink Release Command message to the BSC which currently has access to the uplink and waits for further uplink management messages.

If the relay MSC receives an ABORT message from a anchor MSC, it sends release messages to all BSCs, informs the GCR that the call is no longer on-going and the process returns to the idle state.

Call release

When receiving a release message from the anchor MSC for the dedicated connection which was set-up to for the initiating service subscriber located in the relay MSC area, the relay MSC releases the connection to the service subscriber and the process returns to the idle state.

When the initiating service subscriber releases the call while a dedicated connection to the anchor MSC is established, the relay MSC sends a release message for the dedicated connection to the anchor MSC and the process returns to the idle state.

When the initiating service subscriber releases the call, the relay MSC sends a Process Group Call Signalling message to the anchor MSC indicating "release group call" and waits for the Send Group Call End Signal Acknowledgement.

When receiving a Send Group Call End Signal Acknowledgement from the anchor MSC, the relay MSC releases all downlinks to cells inside the relay MSC area, informs the GCR that the call is no longer on-going and the process returns to the idle state.

3GPP TSG-CN-WG1, Meeting #13
14-18 August, 2000
Vancouver/Canada

Tdoc N1-000971

Title: **Response to LS on Support of additional GPRS ciphering algorithms**

Source: **CN WG1**

TO [1]: **TSG CN, TSG SA2**

Cc: **TSG SA, TSG S3, TSG N4**

WI: **Security**

Contact Person:

Name: **Monica Wifvesson, Ericsson**
E-mail Address: **Monica.Wifvesson@ecs.ericsson**

Tel. Number: **+46 46 193000**

Attachments: **N1-001028, N1-001029**

Date: **18. August 2000**

TSG CN1 has been informed that TSG CN has been asked by TSG SA to reconsider the matter of introducing the possibility for the MS in Release 97 and R98 to signal it's support of the GEA/2 encryption algorithm.

TSG CN1 would like to inform TSG CN that N1 has agreed CR's to GSM 04.08 R97 and R98 regarding support of additional GPRS ciphering algorithms, which can be found in the attached Tdoc's N1-001028 and N1-001029. With this change, a R97 and R98 MS has the ability to signal its capabilities on 7 GPRS ciphering algorithms (GEA1, GEA 2, GEA3 etc.) to the network in the "MS Network Capability" IE which has been extended with one octet. Notice that a R97 and R98 network does not support the GEA2 Encryption Algorithm and will accordingly ignore the new octet in the extended MS network capability IE in the Attach Request message and also the MS Network Capability IE added as an optional IE to the Routing Area Update Request message.

While studying the issue N1 spotted an related problem which is discussed in a separate LS in N1-001023.

[1] Please write any action required from the groups in a clear way.

3GPP TSG-CN-WG1, Meeting #13
14-18 August, 2000
Vancouver/Canada

Tdoc N1-000973

Title: **UMTS Service Request procedure**

Source: **TSG-CN WG1**

TO [1]: **TSG-S2**

Cc:

WI: **GSM / UMTS interworking**

Contact Person:

Name:	**Sunil chotai**
E-mail Address:	**Sunil.chotai@bt.com**
Tel. Number:	**+44 1473 605603**

Attachments: N1-001001, N1-001031
(Please list document numbers to be attached)

Date: **16/08/00**

N1 thanks S2 for the response to their LS on Removal of Service Accept (S2-001054 = N1-00834).

N1 has further discussed this issue at the ad-hoc joint N1/S2 meeting. The meeting came to the conclusion that the stage 2 and stage 3 need to be aligned and clarification to Service Request procedure is required. The following was agreed :

1) If the Service Request procedure was initiated when the MS is in PMM-IDLE mode, then an implicit indication is used to indicate a successful completion of the procedure.

2) If the Service Request procedure was initiated when the MS is in PMM-CONNECTED mode then an explict Service Accept message is used to indicate a successful completion of the procedure.

To reflect this, changes requests to TS 23.060 and TS 24.008 have been drafted.

N1 has agreed to the CR244r2 on 24.008 in tdoc N1-001001(attached).

N1 kindly requests S2 to review the corresponding change request to 23.060 (attached), and to approve this CR if it is acceptable.

[1] Please write any action required from the groups in a clear way.

3GPP TSG-CN-WG1, Meeting #13
14-18 August, 2000
Vancouver/Canada

Tdoc N1-000974

Title: **Reply to LS from SA4 (000327R) on codec types for different access technologies**

Source: **CN1**

TO: **SA4/SMG11**

Cc: **CN4(TrFO/TFO), RAN3**

WI: **OoBTC**

Contact Person:
Name: **Phil Hodges**
E-mail Address: **phil.hodges@eed.ericsson.se**
Tel. Number: **+49 2407 5756628**

Attachments: N1-001005

Date: **18.08.00**

CN1 would like to thank SA4/SMG11 for their response to our question regarding the handling of codec types for different radio access technologies.

CN1 have taken heed of the proposal and implemented CC signalling to support separate codec lists for each radio access type. The codec lists are coded according to the bitmap defined in TFO specification (3G TS 28.062). A length field is added to allow for future extensions of this bitmap. The radio access types are coded according to the Sys_Id from the same TFO specification.

For the downlink notification of the selected codec type the NAS Synchronisation Identifier, contained in RANAP (3G TS 25.413), is used. For R00 this is coded according to the last 4 bits of the long form codec type as defined in TFO specification.

These additions to the call control protocol specification (3G TS 24.008) are described in CR 073R5, Tdoc N1-001005.

CN1 asks SA4 if they would consider moving such definitions from 3G TS 28.062 to the 3GTS 26.103 so that a common location for these definitions exists, for both TrFO and TFO applications. CN1 understands that the 3G TS 26.103 must also contain definitions for codec types for use in NNI OoBTC where the list is defined with an order of priority. The suggestion by CN1 is to include both types of definition.

The coding of the codec types as proposed by CN1 for the CC signalling does not include the supported codec set (SCS) in the uplink or the active codec set (ACS) in the downlink direction. It is assumed that also for future multirate codecs to be specified by SA4, the ME shall support all modes of the respective codec. CN1 kindly asks SA4 to confirm this assumption. [CN1 assumes that this is also a requirement defined by SA4.]

3GPP TSG-CN-WG1, Meeting #13
14-18 August, 2000
Vancouver/Canada

Tdoc N1-000978

Title: **Response to "LS on RAB Assignment QoS Negotiation" from RAN 3**

Source: **TSG CN WG1**

TO [1]: **3GPP TSG RAN WG3**

Cc: **3GPP TSG SA WG2, 3GPP TSG CN WG4, 3GPP TSG S2, 3GPP TSG T2**

WI: **QoS**

Contact Person:

Name: Janne Muhonen
E-mail Address: janne.m.muhonen@nokia.com
Tel. Number: +358 9 511 29638

Attachments: **N1-000837**
(Please list document numbers to be attached)

Date: **17.08.2000**

N1 thanks R3 for their liaison statement. The question contained in this liaison statement which was found to be relevant for N1 was, if it would be possible to include a bitrate range or a set of bitrates in the QoS information element in session management messages to support the QoS negotiation process during the RAB setup with additional information coming from the application.

The issue was discussed in N1, and it was found to be technically feasible to include this kind of additional information in the QoS information element in 24.008.

N1 will await a decision from S2 on this issue before taking further action.

[1] Please write any action required from the groups in a clear way.

3GPP TSG-CN-WG1, Meeting #13
14-18 August, 2000
Vancouver/Canada

Tdoc N1-000979

Title: **Response to LS on 3.1 kHz multimedia calls at 33.6 kbit/s data rate**

Source: **TSG_CN WG1**

TO [1]: **TSG_CN WG3**

Cc: **TSG_T WG2**

WI: **Multimedia**

Contact Person:

Name:	**Janne Muhonen**
E-mail Address:	**janne.m.muhonen@nokia.com**
Tel. Number:	**+358 9 511 29638**

Attachments: **N1-001021**
(Please list document numbers to be attached)

Date: **18th Aug 2000**

TSG_CN WG1 thanks the TSG_CN WG3 for their LS (tdoc N1-000838/ N3-000389) on 3.1 kHz multimedia calls at 33.6 kbit/s data rate.

TSG_CN WG1 has studied existing MODIFY procedures of the TS 24.008 for informing the MS about the new fixed network user rate. As a conclusion it has been identified that the current procedures do not support functionality described in the LS from TSG_CN WG3.

However, TSG_CN WG1 has introduced required changes to the TS 24.008 (see attached change request N1-001021).

[1] Please write any action required from the groups in a clear way.

3GPP TSG-CN-WG1, Meeting #13
14-18 August, 2000
Vancouver/Canada

Tdoc N1-000980

Title: **Answer to the liaison statement on the modified lengths of parameters AUTN and AUTS.**

Source: **CN1**

TO: **CN4**

WI: **Security**

Contact Person:
Name: **Robert Zaus**
E-mail Address: **robert.zaus@icn.siemens.de**
Tel. Number: **+49 89 722 26899**

Date: **15.08.00**

CN1 would like to thank CN4 for their liaison statement on the modified lengths of parameters AUTN and AUTS (N4-000537).

CN1 noted these changes already and drafted 2 CRs to TS 24.008 which were approved at TSG CN#8 plenary as CR 216r2 and 217r1.

3GPP-CN1 Meeting #13
Vancouver/Canada, 14-18 August 2000

Document N1-000990
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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

23.009	CR	011r1	Current Version:	3.3.0

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

For submission to:	CN#9	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

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

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

Source: Nortel Networks **Date:** 7 August 2000

Subject: Directed Retry in UMTS and Inter-system

Work item: GSM/UMTS interworking

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

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

Reason for change: Directed retry in the cases of inter-system handover and SRNS relocation is marked as FFS. In UMTS, all procedures to execute directed retry are already defined. This contribution adds text to clarify directed retry for inter-system handovers and relocation.

Clauses affected: 14

Other specs affected:

Other 3G core specifications	X	→ List of CRs:	25.413
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

help.doc

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

3G TS 23.009 V3.3.0 (2000-06)

Technical Specification

3rd Generation Partnership Project; Technical Specification Group Core Network; Handover procedures (Release 1999)

14 Directed retry handover

~~[Directed retry in the cases of inter-system handover and SRNS relocation is FFS]~~

The directed retry procedure allows the network to select the optimum cell for the ~~Mobile Station~~UE/MS. The process of directed retry involves the assignment of a ~~Mobile Station~~UE/MS to a radio channel on a cell other than the serving cell. This process is triggered by the assignment procedures, as described in GSM 08.08 for GSM [5] and 25.413 for UMTS, and employs internal or external handover procedures as described in clauses 6, ~~and~~ 7 and 8.

The successful procedure for a directed retry in the case of of an Intra-MSC handover is as shown in figure 40 and as described below.

If during the assignment phase, as represented by the A-ASSIGNMENT-REQUEST message, a handover becomes necessary, due to either radio conditions or congestion, then the Mobile Station may be handed over to a different cell. When the decision has been made to handover the MS the BSS-A may send an A-ASSIGNMENT-FAILURE message, indicating 'directed retry', before sending the A-HANDOVER-REQUIRED message to MSC-A, indicating 'directed retry'. However BSS-A may alternatively send the A-HANDOVER-REQUIRED message, indicating 'directed retry', without sending the A-ASSIGNMENT-FAILURE message. Other cause values may be used instead of "Directed Retry" in the A-HANDOVER-REQUIRED message, this will allow the MSC to take different actions dependent on the received cause. Upon receipt of the A-HANDOVER-REQUIRED message from BSS-A, then MSC-A shall initiate the handover as described in clauses 6 and 7. No resources shall be cleared in the MSC-A or BSS-A for this connection.

After receipt of the A-HANDOVER-COMPLETE message from BSS-B the assignment procedure shall be considered to be complete and the resources on BSS-A shall be cleared.

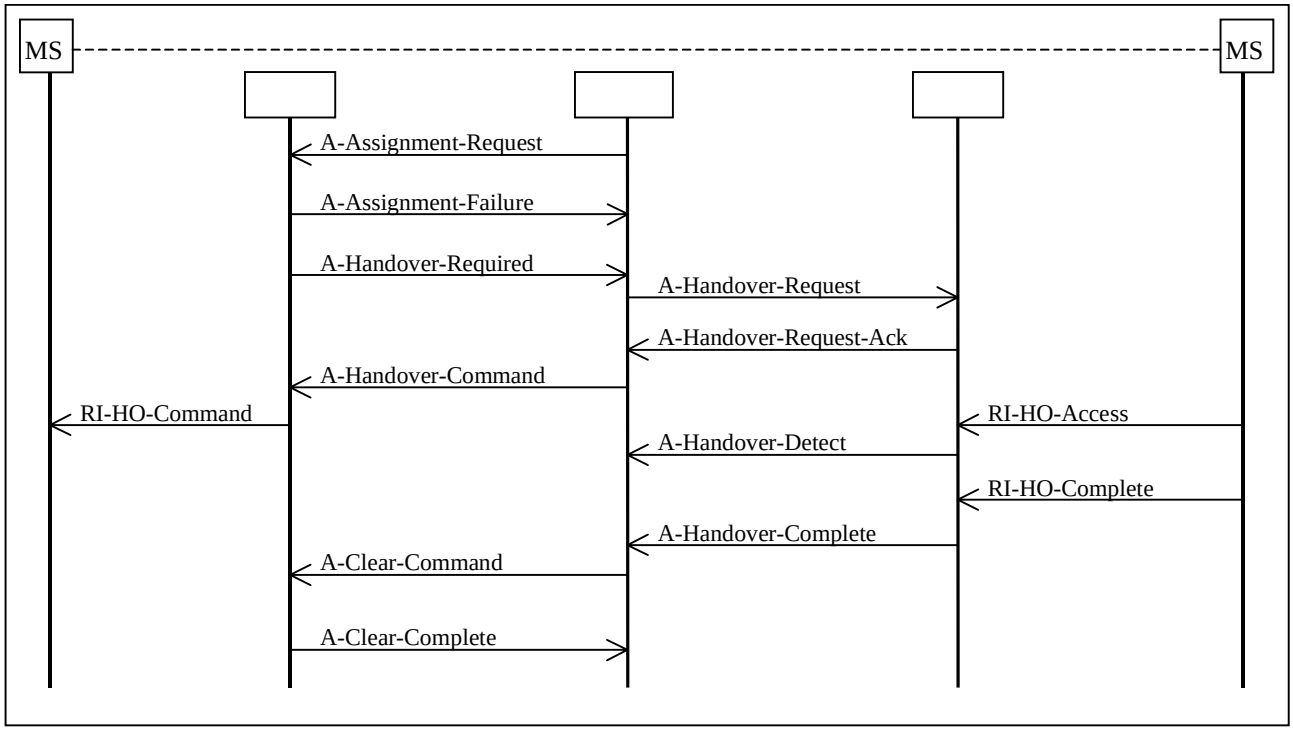


Figure 40: Example of a Directed Retry Intra-MSC Handover Procedure

If a failure occurs during the handover attempt, for example A-HANDOVER-FAILURE returned from BSS-A or BSS-B, then MSC-A will terminate the handover to BSS-B. Under these conditions MSC-A may optionally take one of a number of actions:

i) retry the handover to the same cell;

ii) select the next cell from the list contained in the A-HANDOVER-REQUIRED message and attempt a handover to the new cell;

iii) send an A-HANDOVER-REQUIRED-REJECT to BSS-A, if an A-HANDOVER-COMMAND has not already been sent;

iv) retry the assignment procedure to BSS-A, if the failure message was returned from BSS-A. This option is additional to those for normal handover;

v) Clear the complete call.

The procedures for Inter-MSC handover are also applicable to the directed retry process. If an Inter-MSC handover is necessary then the assignment process should be considered to have completed successfully upon receipt of the A-HO-COMPLETE included in the MAP-SEND-END-SIGNAL request.

The successful procedure for a directed retry in the case of an Intra-3G_MSC SRNS relocation is as shown in figure 41 and as described below.

If during the assignment phase, as represented by the Iu-RAB-ASSIGNMENT-REQUEST message, a handover becomes necessary, due to either radio conditions or congestion, then the UE may be handed over to a different cell. When the decision has been made to handover the UE the RNS-A may send an Iu-RAB-ASSIGNMENT-RESPONSE message, indicating a failure to establish and a cause of 'directed retry', before sending the Iu-RELOCATION-REQUIRED message to 3G_MSC-A, indicating 'directed retry'. However RNS-A may alternatively send the Iu-RELOCATION-REQUIRED message, indicating 'directed retry', without sending the Iu-RAB-ASSIGNMENT-RESPONSE message indicating the failure to establish. Other cause values may be used instead of "Directed Retry" in the Iu-RELOCATION-REQUIRED message, this will allow the 3G_MSC to take different actions dependent on the received cause. Upon receipt of the Iu-RELOCATION-REQUIRED message from RNS-A, then 3G_MSC-A shall initiate the handover as described in clauses 6 and 8. No resources shall be cleared in the 3G_MSC-A or RNC-A for this connection. After receipt of the Iu-RELOCATION -COMPLETE message from RNS-B the assignment procedure shall be considered to be complete and the resources on RNS-A shall be cleared.

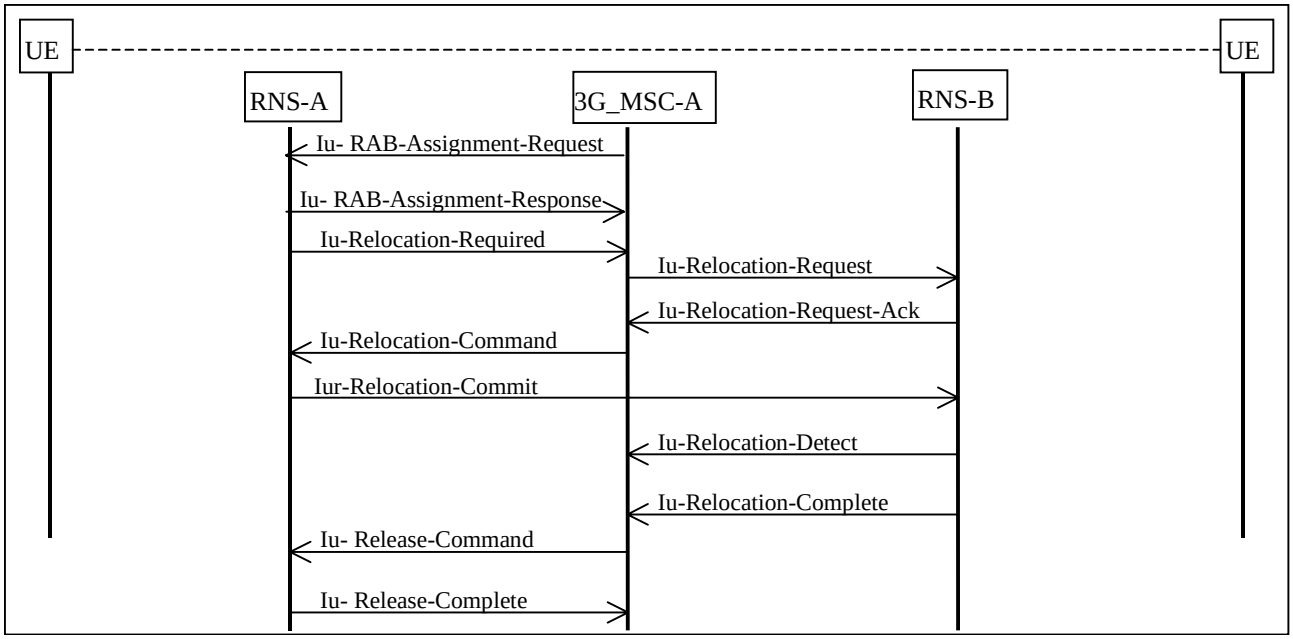


Figure 41 Example of a Directed Retry Intra-3G_MSC SRNS Relocation Procedure

If a failure occurs during the relocation attempt, for example Iu-RELOCATION-FAILURE returned from RNS-B, then 3G_MSC-A will terminate the handover to RNS-B. Under these conditions 3G_MSC-A may optionally take one of a number of actions:

i) retry the handover to the same cell;

ii) send an Iu-RELOCATION-PREPARATION FAILURE to RNS-A, if an Iu-RELOCATION-COMMAND has not already been sent;

iii) retry the assignment procedure to RNS-A, if the failure message was returned from RNS-A. This option is additional to those for normal handover;

iv) Clear the complete call.

The procedures for Inter-3G_MSC relocation are also applicable to the directed retry process. If an Inter-3G_MSC handover is necessary then the assignment process should be considered to have completed successfully upon receipt of the Iu-RELOCATION-COMPLETE included in the MAP-SEND-END-SIGNAL request.

The directed retry procedure is also applicable to Inter-system handovers, specifically Intra-3G_MSC handover from UMTS to GSM, Intra-3G_MSC handover from GSM to UMTS, Inter-3G_MSC handover from UMTS to GSM, and Inter-3G_MSC handover from GSM to UMTS.

3GPP TSG-CN-WG1, Meeting #13
14-18 August, 2000
Vancouver/Canada

Tdoc N1-000997

Title: **Answer to Proposal of exchange of the terms “in GSM“ and “in UMTS“**

Source: **TSG-CN WG1**

TO [1]: **TSG-SA WG1, TSG-SA WG2, TSG-GERAN WG2, TSG-R2**

Cc: **TSG-CN**

WI: **TEI**

Contact Person:

Name: Hannu Hietalahti / Nokia
E-mail Address: Hannu.Hietalahti@nokia.com
Tel. Number: +358-40-5021724

Attachments:

Date: **16.8.2000**

TSGN1 thanks TSGS2 for their LS (S2-000989 / N1-000957) on R99 terminology.

TSGN1 agree that the current terminology "In GSM" and "In UMTS" is not very clear and that it will not be applicable as such for R00.

However, as these labels have been used systematically in R99 to distinguish the requirements for the MS depending on the serving radio access network, it will not be easy to change the interpretation given to these terms. Changing only the label means clarification of the terminology while changing the label and its definition would change the mobile station and network requirements causing implementation rework. Due to this TSGN1 does not see any possibility to change the meaning of the terms at this stage.

For R00 and later TSGN1 sees that a change of the functionality will be needed as the serving radio access network can not be taken as an indication of the network architecture behind it.

Therefore TSGN1 can not accept the change proposed by TSGS2 but the following counterproposal is made:

For R99
The terms proposed by TSGS2 are used with the existing definitions from e.g. 24.008. This would produce the following definitions (24.008, section 2):

- **In ~~GSM~~A/Gb mode,...** Indicates this paragraph applies only to GSM System. For multi system case this is determined by the current serving radio access network.
- **In ~~UMTS~~Iu mode,...** Indicates this paragraph applies only to UMTS System. For multi system case this is determined by the current serving radio access network.

For R99 system the definitions would still be correct as the Iu/A –inteface can be deduced from the serving access network.

[1] Please write any action required from the groups in a clear way.

3GPP TSG-CN-WG1, Meeting #13
14-18 August, 2000
Vancouver/Canada

Tdoc N1-000997

For R00
The terms defined for R99 would still be used but due to the changes in R00 architecture the criteria (*in italics)* must change to e.g. what has been proposed by TSGS2. This change will be an essential change on the mobile and network implementation but this is acceptable for R00.

- In A/Gb mode,... ***Indicates this paragraph applies only to GSM System. For multi system case this is determined by the current serving radio access network.*** (–> this will need to change to some indication of the A- or Iu interface)

- In Iu mode,... ***Indicates this paragraph applies only to UMTS System. For multi system case this is determined by the current serving radio access network.*** (–> this will need to change to some indication of the A- or Iu interface)

Questions:
TSGN1 is willing to do the proposed change of terminology to all R99 specifications under its control for TSGN #9. Before doing the work we would like to have a confirmation for our proposal from TSGS1 and TSGS2.

TSGS1, TSGS2:
Is the proposal outlined in this document acceptable?

TSG-GERAN WG2, TSG-R2, TSGS2:
For R00 it seems that a DL indication of the network configuration is needed. RR layer indication, possibly in system information messages was seen by TSGN1 as one alternative. TSGN1 would like to hear the opinion of the WGs responsible for the radio networks.

3GPP TSG-CN-WG1, Meeting #13
14-18 August, 2000
Vancouver/Canada

Tdoc N1-000997

The original LS text for background information:

Liaison Statement

Source: TSG SA WG2
Title: Proposal of exchange of the terms "in GSM" and "in UMTS"
To: TSG CN WG1, TSG SA WG1
Cc:

In 23.060, 24.008 and other specifications handled by at least S2, N1 and N3, the terms "in GSM" and "in UMTS" are used to describe a behaviour or "mode of operation" in a UE and a 2G/3G SGSN. This behaviour is depending on if the A/Gb interfaces or the Iu-CS/Iu-PS interfaces are in use due to the different function division in GSM and UMTS.

The introduction of GERAN in R00 may not fit very well with the terms "in GSM" and "in UMTS" used in e.g. 23.060 since GERAN has both a Gb interface and an Iu-PS interface. Therefore, it would be good to make an editorial modification of the use of terminology.

It is important to make an editorial modification that makes it easy to update all the all ready approved R99 specifications and that, at the same time, do not constrain the development of standards in at least R00 and R01.

TSG SA WG2 agreed to use the terms "in A/Gb mode" and "in Iu mode" to replace the terms "in GSM" and "in UMTS", respectively.
The following definitions was made:

> **In A/Gb mode:** indicates that this (sub)clause or paragraph applies only to a system or sub-system which operate in A/Gb mode of operation, i.e. with a functional division that is in accordance with the use of an A or a Gb interface between the radio access network and the core network.
>
> **In Iu mode:** indicates that this (sub)clause or paragraph applies only to a system or sub-system which operate in Iu mode of operation, i.e. with a functional division that is in accordance with the use of an Iu-CS or Iu-PS interface between the radio access network and the core network..

TSG SA WG2 suggests that the definitions above are adopted. However, TSG SA WG2 would like especially TSG CN WG1 to verify the applicability of these definitions in the R99 specifications such as 24.008. Furthermore, to consider if these definitions could circumvent ambiguity in R00.

3GPP TSG-CN-WG1, Meeting #13
14-18 August, 2000
Vancouver/Canada

Tdoc N1-000998

Title: **GPRS Stage 2**

Source: **TSG-CN WG1**

TO [1]: **TSG-S2**

Cc: **TSG-CN**

WI: **GSM / UMTS interworking**

Contact Person:

Name:	**Sunil chotai**
E-mail Address:	**Sunil.chotai@bt.com**
Tel. Number:	**+44 1473 605603**

Attachments:

(Please list document numbers to be attached)

Date: **15/08/00**

Following on from the N1/S2 joint session on SIP issues, some urgent R99 GPRS related issues were progressed in an ad-hoc N1/S2 session, and the issue of future maintenance of GPRS stage 2 was raised.

Considering that the detailed architecture aspects of GPRS signaling protocols is now stable, S2 may wish to review whether GPRS stage 2 (TS 23.060 and earlier releases TS 03.60) should be moved to one of the TSG Core Networks group. Before the transfer to TSG S2, TSG N1 was responsible for GPRS Stage 2.

TSG N1 is responsible for the stage 3 protocols impacting the Mobile Station including GPRS Session Management (SM) and GPRS Mobility Management (GMM) (TS 24.008).

With the Stage 2 in a different TSG, N1 notes that keeping stage 3 in line with stage 2 (TS 23.060) adds delays when changes need to be made to these specifications, for example recent GPRS issues related to P-TMSI signature, Service Request, compatibility between R97 & R99.

N1 believe that S2 is the appropriate group for GPRS stage 2 and support for it to continue its current role. However, if S2 see the need to transfer this work to one of the TSG Core Network group, then N1 see some benefits in moving it to N1 as both stage 2 and stage 3 (SM, GMM etc) would be in one group.

N1 would welcome views on the future development/maintenance of GPRS Stage 2 (23.060) specification.

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[1] Please write any action required from the groups in a clear way.

3GPP/SMG Meeting TSG-CN1 #13
Vancouver, Canada, 14-18 August 2000

Document N1-001001
revised N1-000984
revised N1-000885

CHANGE REQUEST

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

24.008	CR	244 r2	Current Version:	3.4.1

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

For submission to:	TSG CN #9	For approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

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

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

Source: Ericsson, Siemens AG **Date:** 2000-08-08

Subject: Clarification to Service Request procedure

Work item: GSM-UMTS Interworking

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

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

Reason for change:

This CR proposes that:

- If the Service Request procedure was initiated when the MS is in PMM-IDLE mode, then an indication from the lower layers that the security mode control procedure is completed shall be treated as a successful completion of the procedure.
- If the Service Request procedure was initiated when MS is in PMM-CONNECTED mode, then the reception of the SERVICE ACCEPT message, shall be treated as a completion of the procedure when the Service Type indicates ‘data’.

Clauses affected: 4.7.13, 9.4.21, 9.4.22, 11.2.2

Other specs affected:

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

Other comments:

4.7.13 Service Request procedure (UMTS only)

The purpose of this procedure is to transfer the PMM mode from PMM-IDLE to PMM-CONNECTED mode, and/or to assign radio access bearer in case of PDP contexts are activated without radio access bearer assigned. In latter case, the PMM mode may be PMM-IDLE or PMM-CONNECTED mode. This procedure is used for;

- the initiation of CM layer service (e.g. SM or SMS) procedure from the MS in PMM-IDLE mode.
- the network to transfer down link signalling,
- uplink and downlink user packet.

For downlink transfer of signalling or user packet, the trigger is given from the network by the paging request procedure, which is out of scope of this specification.

Service type can take either of the following values, “signalling”, “data” or “paging response”. Each of the values shall be selected according to the criteria to initiate the Service request procedure.

The criteria to invoke the Service request procedure are when;

a) the MS has any signalling message, that requires security protection, to be sent to the network in PMM-IDLE mode (i.e., no secure PS signalling connection has been established). In this case, the service type shall be set to “signalling”.

b) the MS, either in PMM-IDLE and PMM-CONNECTED mode, has pending user packet to be sent and no radio access bearer is established for the PDP context. The procedure is initiated by an indication from the lower layers (see TS 24.007). In this case, the service type shall be set to “data”.

c) the MS receives a paging request for PS domain from the network in PMM-IDLE mode. In this case, the service type shall be set to “paging response”.

After completion of a Service request procedure, the pending service is resumed and uses then the connection established by the procedure. If the service type is indicating “data”, then the radio access bearers for all the activated PDP contexts are re-established. The selective re-assignment capability is not supported for the simplicity of the function.

4.7.13.1 Service Request procedure initiation

The MS initiates the Service request procedure by sending a SERVICE REQUEST message. The timer T3317 shall be started after the SERVICE REQUEST message has been sent and state GMM-SERVICE-REQUEST-INITIATED is entered. The message SERVICE REQUEST shall contain the P-TMSI and the Service type shall indicate either data, signalling or paging response.

4.7.13.2 GMM common procedure initiation

The network may initiate GMM common procedures, e.g. the GMM identification or the GMM authentication and ciphering procedure, depending on the received information such as GPRS ciphering key sequence number and P-TMSI.

4.7.13.3 Service request procedure accepted by the network

An indication from the lower layers that the security mode ~~setting~~ control procedure is completed, or reception of a SERVICE ACCEPT message, shall be treated as a successful completion of the procedure. The timer T3317 shall be stopped, and the MS enters GMM-REGISTERED state and PMM-CONNECTED mode.

4.7.13.4 Service request procedure not accepted by the network

- If the Service request cannot be accepted, the network returns a SERVICE REJECT message to the mobile station. An MS that receives a SERVICE REJECT message stops timer T3317. The MS shall then take different actions depending on the received reject cause value:

  # 3 (Illegal MS); or

  # 6 (Illegal ME)

- 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 enter the state GMM-DEREGISTERED. Furthermore, it shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number and shall consider the SIM as invalid for GPRS services until switching off or the SIM is removed.

- A GPRS MS operating in MS operation mode A shall in addition set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ~~GPRS~~ ciphering key sequence number. The new MM state is MM IDLE. The SIM shall be considered as invalid also for 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 4.1.3.2.9) 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 state is GMM-DEREGISTERED.

  # 9 (MS identity cannot be derived by the network)

- The MS shall set the GPRS update status to GU2 NOT UPDATED (and shall store it according to section 4.1.3.2), enter the state GMM-DEREGISTERED, and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. Subsequently, the MS may automatically initiate the GPRS attach procedure.

  # 10 (Implicitly detached)

- The MS shall change to state GMM-DEREGISTERED.NORMAL-SERVICE. The MS shall then perform a new attach procedure. The MS should also activate PDP context(s) to replace any previously active PDP contexts.

NOTE: In some cases, user interaction may be required and then the MS cannot activate the PDP context(s) automatically.

  # 11 (PLMN not allowed);

  # 12 (Location area not allowed); or

  # 13 (Roaming not allowed in this location area)

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

- A GPRS MS operating in MS operation mode A shall in addition set the update status to U3 ROAMING NOT ALLOWED and shall delete any TMSI, LAI and ~~GPRS~~ ciphering key sequence number. The new MM state is MM IDLE.

- The MS shall store the LAI or the PLMN identity in the appropriate forbidden list, i.e. in the “forbidden PLMN list” for cause #11, in the list of “forbidden location areas for regional provision of service” for cause #12 or in the list of “forbidden location areas for roaming” for cause #13. If #11or #13 was received, the MS shall perform a PLMN selection instead of a cell selection.

  # 40 (No PDP context activated)

- The MS shall deactivate locally all active PDP contexts and the MS shall enter the state GMM-REGISTERED.NORMAL-SERVICE. The MS may also activate PDP context(s) to replace any previously active PDP contexts.

NOTE: In some cases, user interaction may be required and then the MS cannot activate the PDP context(s) automatically.

Other values are considered as abnormal cases. The specification of the MS behaviour in those cases is described in section 4.7.13.5.

4.7.13.5 Abnormal cases in the MS

The following abnormal cases can be identified:

a) Access barred because of access class control

The Service request procedure shall not be started. The MS stays in the current serving cell and applies normal cell reselection process. The Service request procedure may be started by CM layer if it is still necessary, i.e. when access is granted or because of a cell change.

b) Lower layer failure before the security mode ~~setting~~ control procedure is completed, SERVICE ACCEPT or SERVICE REJECT message is received

The procedure shall be aborted.

c) T3317 expired

The MS shall enter GMM-REGISTERED state.

If the MS is in PMM-IDLE mode then ~~T~~the procedure shall be aborted and the MS shall initiate a PS signalling connection release.

If the MS is in PMM-CONNECTED mode, then an expiry of the timer T3317 shall be treated as a completion of the service request procedure.

d) SERVICE REJECT received other causes than those treated in section 4.7.x.4

The procedure shall be aborted.

e) Routing area update procedure is triggered

If a cell change into a new routing area occurs and the necessity of routing area update procedure is determined before the security mode ~~setting~~ control procedure is completed, a SERVICE ACCEPT or SERVICE REJECT message has been received, the Service request procedure shall be aborted and the routing area updating procedure is started immediately. Follow-on request pending may be indicated in the ROUTING AREA UPDATE REQUEST for the service, which was the trigger of the aborted Service request procedure, to restart the pending service i~~f~~tself or the Service Request procedure after the completion of the routing area updating procedure. If the service type of the aborted SERVICE REQUEST was indicating “data”, then the routing area update procedure may be followed by a re-initiated Service request procedure indicating “data”, if it is still necessary.

f) Power off

If the MS is in state GMM-SERVICE-REQUEST-INITIATED at power off, the GPRS detach procedure shall be performed.

g) Procedure collision

If the MS receives a DETACH REQUEST message from the network in state GMM-SERVICE-REQUEST-INITIATED, the GPRS detach procedure shall be progressed and the Service request procedure shall be aborted. If the cause IE, in the DETACH REQUEST message, indicated a “reattach request”, the GPRS attach procedure shall be performed.

4.7.13.6 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 security mode ~~setting~~ control procedure is completed a SERVICE ACCEPT or SERVICE REJECT message has been sent to the MS, the network enters/stays in PMM-IDLE.

b) Protocol error

If the SERVICE REQUEST message is received with a protocol error, the network shall return a SERVICE 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.

The network stays in PMM-IDLE mode.

~~c.1) SERVICE REQUEST received~~

~~If one or more of the information elements in the SERVICE REQUEST message differ from the ones received within the previous SERVICE REQUEST message, the previously initiated Service request procedure shall be aborted and the new Service request procedure shall be progressed, or.~~

~~If no information element differ, then the SERVICE ACCEPT message shall be resent.~~

c~~.2~~) More than one SERVICE REQUEST received and the procedure has not been completed (i.e., the security mode ~~setting~~ control procedure has not been completed or SERVICE ACCEPT, SERVICE REJECT message has not been sent),

- If one or more of the information elements in the SERVICE REQUEST message differs from the ones received within the previous SERVICE REQUEST message, the previously initiated Service request procedure shall be aborted and the new Service request procedure shall be progressed ;

- If the information elements do not differ, then the network shall continue with the previous Service request procedure and shall not treat any further this SERVICE REQUEST message.

d) ATTACH REQUEST received before the security mode ~~setting~~ control procedure has been completed or an SERVICE ACCEPT or an SERVICE REJECT message has been sent.

If an ATTACH REQUEST message is received and the security mode ~~setting~~ control procedure has not been completed or an SERVICE ACCEPT or an SERVICE REJECT message has not been sent, the network may initiate the GMM common procedures, e.g. the GMM authentication and ciphering procedure. The network may e.g. after a succesful GMM authentication and ciphering procedure execution, abort the Service request procedure, the GMM context and PDP contexts, if any, are deleted and the new ATTACH REQUEST is progressed.

e) ROUTING AREA UPDATE REQUEST message received before the security mode ~~setting~~ control procedure has been completed or an SERVICE ACCEPT or an SERVICE REJECT message has been sent

If an ROUTING AREA UPDATE REQUEST message is received and the security mode ~~setting~~ control procedure has not been completed or an SERVICE ACCEPT or an SERVICE REJECT message has not been sent, the network may initiate the GMM common procedures, e.g. the GMM authentication and ciphering procedure. The network may e.g. after a successful GMM authentication and ciphering procedure execution, abort the Service request procedure and progress the routing area update procedure.

f) If the Service Type indicates 'data' and the network fails to re-establish some or all RAB(s) then the SGSN may determines if PDP Context Modification or PDP Context Deactivation should be initiated. The appropriate action depends on the QoS profile of the PDP Context and is an operator choice.

9.4.22 Service Reject (UMTS only)

This message is sent by the network to the UE in order to reject the Service request procedure. See table 9.4.22/TS 24.008.

Message type: Service ~~Accept~~ Reject

Significance: dual

Direction: network to MS

Table 9.4.22/TS 24.008: Contents of Service Reject 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
	Service Reject	Message type 10.4	M	V	1
	GMM cause	GMM cause 10.5.5.14	M	V	1

***** Next Modification *****

11.2.2 Timers of GPRS mobility management

Table 11.3/TS 24.008: GPRS Mobility management timers - MS side

TIMER NUM.	TIMER VALUE	STATE	CAUSE OF START	NORMAL STOP	ON THE 1st , 2nd, 3rd , 4th EXPIRY Note 3
T3310	15s	GMM-REG-INIT	ATTACH REQ sent	ATTACH ACCEPT received ATTACH REJECT received	Retransmission of ATTACH REQ
T3311	15s	GMM-DEREG ATTEMPTING TO ATTACH or GMM-REG ATTEMPTING TO UPDATE	ATTACH REJ with other cause values as described in chapter 'GPRS Attach' ROUTING AREA UPDATE REJ with other cause values as described in chapter 'Routing Area Update' Low layer failure	Change of the routing area	Restart of the Attach or the RAU procedure with updating of the relevant attempt counter
T3321	15s	GMM-DEREG-INIT	DETACH REQ sent	DETACH ACCEPT received	Retransmission of the DETACH REQ
T3330	15s	GMM-ROUTING-UPDATING-INITIATED	ROUTING AREA UPDATE REQUEST sent	ROUTING AREA UPDATE ACC received ROUTING AREA UPDATE REJ received	Retransmission of the ROUTING AREA UPDATE REQUEST message

Table 11.3a/TS 24.008: GPRS Mobility management timers – MS side

TIMER NUM.	TIMER VALUE	STATE	CAUSE OF START	NORMAL STOP	ON EXPIRY
T3302	Default 12 min Note 1	GMM-DEREG or GMM-REG	At attach failure and the attempt counter is greater than or equal to 5. At routing area updating failure and the attempt counter is greater than or equal to 5.	At successful attach At successful routing area updating	On every expiry, initiation of the GPRS attach procedure Or RAU procedure
T3312	Default 54 min Note1	GMM-REG	In GSM, when READY state is left. In UMTS, when PMM-CONNECTED mode is left.	When entering state GMM-DEREG	Initiation of the Periodic RAU procedure
T3314 READY (GSM only)	Default 44 sec Note 2	All except GMM-DEREG	Transmission of a PTP PDU	Forced to Standby	No cell-updates are performed
T3317 (UMTS only)	10s	GMM-SERVICE-REQUEST-INITIATED~~GMM-REG~~	SERVICE REQ sent	Security mode ~~setting~~ control procedure is completed, SERVICE ACCEPT received, or SERVICE REJECT received	Abort the procedure

NOTE 1: The value of this timer is used if the network does not indicate another value in a GMM signalling procedure.

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.

NOTE 3: Typically, the procedures are aborted on the fifth expiry of the relevant timer. Exceptions are described in the corresponding procedure description.

Table 11.4/TS 24.008: GPRS Mobility management timers - network side

TIMER NUM.	TIMER VALUE	STATE	CAUSE OF START	NORMAL STOP	ON THE 1st, 2nd, 3rd, 4th EXPIRY Note 3
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 AUTHENT- AND CIPHER- FAILURE received	Retransmission of AUTH AND CIPH REQUEST Procedural behaviour is FFS
T3370	6s	GMM-COMMON-PROC-INIT	IDENTITY REQUEST sent	IDENTITY RESPONSE received	Retransmission of IDENTITY REQUEST

Table 11.4a/TS 24.008: GPRS Mobility management timers - network side

TIMER NUM.	TIMER VALUE	STATE	CAUSE OF START	NORMAL STOP	ON EXPIRY
T3313	Note1	GMM_REG	Paging procedure initiated	Paging procedure completed	Network dependent
T3314 READY (GSM only)	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
Mobile Reachable	Default 4 min greater than T3312	All except GMM-DEREG	In GSM, change from READY to STANDBY state In UMTS, change from PMM-CONNECTED mode to PMM-IDLE mode.	PTP PDU received	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.

3GPP TSG-N WG1 #13
Vancouver, Canada 14 Aug– 18 Aug 2000

Document ***N1-001005***
N1-000921
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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

24.008	**CR**	**073R5**	Current Version:	3.4.1

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

For submission to:	TSG-N#9	for approval	X	strategic		*(for SMG use only)*
list expected approval meeting # here ↑		for information		non-strategic		

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

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

Source: Ericsson L.M **Date:** 11Aug2000

Subject: CC enhancements to cover UMTS codec negotiation and selection procedures

Work item: Out-of-Band Transcoder Control

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

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

Reason for change:

Handling of codec types in CC protocol requires a more generic negotiation mechanism to support new codec types from the UE and to indicate & modify the codec type to be used by the UE.

Supported speech codec information received from the mobile terminal must differentiate between codecs supported in UMTS and codecs supported in GSM for intersystem handover. This means additional information is required to what is currently received by the MSC in the Bearer Capabilities IE.

No codec information is supported by the Radio Network compared to GSM where the GSM BSC returns chosen speech versions to the mobile terminal via RR messages, thus a new Non Access Stratum container is required for this purpose in a UMTS system.

The requirement for Out Of Band Transcoder Negotiation highlights the need for a standardised format for this information.

Clauses affected: 5.2.1, 5.2.2.3, 5.2.3.2, 5.2.3.3, 5.2.3.4, 5.3.3, 5.3.4.3.2, 9.3.2, 9.3.8,9.3.17b, 9.3.23.2, 10.5.4

Other specs affected:

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

Other comments:

help.doc

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

First Paragraph Changed

5.2.1 Mobile originating call establishment

The call control entity of the mobile station initiates establishment of a CC connection by requesting the MM sublayer to establish a mobile originating MM connection and entering the "MM connection pending" state. There are two kinds of a mobile originating call: basic call and emergency call. The request to establish an MM connection shall contain a parameter to specify whether the call is a basic or an emergency call. This information may lead to specific qualities of services to be provided by the MM sublayers. Timer T303 is started when the CM SERVICE REQUEST message is sent.

For mobile stations supporting eMLPP basic calls may optionally have an associated priority level as defined in GSM 03.67. This information may also lead to specified qualities of service to be provided by the MM sublayers.

While being in the "MM connection pending" state, the call entity of the mobile station may cancel the call prior to sending the first call control message according to the rules given in section 4.5.1.7.

The mobile station supporting multicall that is initiating an emergency call shall release one or more existing call to ensure the emergency call can be established if the multicall supported information stored in the mobile station described in section 5.2.1.2 and 5.2.2.1 indicates the network doesn't support multicall and some ongoing calls exists.

Having entered the "MM connection pending" state, upon MM connection establishment, the call control entity of the mobile station sends a setup message to its peer entity. This setup message is

- a SETUP message, if the call to be established is a basic call, and
- an EMERGENCY SETUP message, if the call to be established is an emergency call.

For UMTS speech calls no UMTS speech versions shall be included in *bearer capability IE*. For a ME which supports GSM and UMTS and supports more than GSM speech version 1 then speech versions for GSM shall be included in *Bearer Capability* IE. For a UMTS established call these GSM speech versions shall be used by the network for handover to GSM. ~~For UMTS speech calls~~ A ME which supports more than the default UMTS AMR codec shall include a list of supported codecs in *Supported Codec List* IE. Otherwise default UMTS AMR speech version shall be assumed.

For a GSM established call the list shall be used by the network for handover to UMTS.

It then enters the "call initiated" state. Timer T303 is not stopped.

The setup message shall contain all the information required by the network to process the call. In particular, the SETUP message shall contain the called party address information. If the mobile station supports multicall, it shall include the Stream Identifier (SI) information element. For the first call i.e. when there are no other ongoing calls the SI value shall be 1.

If timer T303 elapses in the "MM connection pending" state, the MM connection in progress shall be aborted and the user shall be informed about the rejection of the call.

5.2.1.1 Call initiation

The "call initiated" state is supervised by timer T303.For normal MO calls, this timer will have already been started after entering the "MM connection pending" state. For network-initiated MO calls this timer will be started in the recall present state as defined in section 5.2.3.4

When the call control entity of the mobile station is in the "call initiated" state and if it receives:

i) a CALL PROCEEDING message, it shall proceed as described in section 5.2.1.3;

ii) an ALERTING message, it shall proceed as described in section 5.2.1.5;

iii) a CONNECT message, it shall proceed as described in section 5.2.1.6;

iv) a RELEASE COMPLETE message it shall proceed as described in section 5.2.1.2.

Abnormal case:

- If timer T303 elapses in the "call initiated" state before any of the CALL PROCEEDING, ALERTING, CONNECT or RELEASE COMPLETE messages has been received, the clearing procedure described in section 5.4 is performed.

5.2.1.2 Receipt of a setup message

In the "null" or "recall present" states, upon receipt of a setup message (a SETUP message or an EMERGENCY SETUP message, see section 5.2.1.1), the call control entity of the network enters the "call initiated" state. It shall then analyse the call information contained in the setup message.

In UMTS, network shall include the SI received in the SETUP message into the RABid and send it back to the mobile station. For RABid see TS 25.413. If the network receives the SETUP message with no SI, the network shall set the SI value to 1.

i) If, following the receipt of the setup message, the call control entity of the network determines that the call information received from the mobile station is invalid (e.g. invalid number), then the network shall initiate call clearing as defined in section 5.4 with one of the following cause values:

   # 1 "unassigned (unallocated) number"

   # 3 "no route to destination"

   # 22 "number changed"

   # 28 "invalid number format (incomplete number)"

ii) If, following the receipt of the setup message, the call control entity of the network determines that a requested service is not authorized or is not available, it shall initiate call clearing in accordance with section 5.4.2 with one of the following cause values:

   # 8 "operator determined barring",

   # 57 "bearer capability not authorized",

   # 58 "bearer capability not presently available",

   # 63 "service or option not available, unspecified", or

   # 65 "bearer service not implemented".

iii) Otherwise, the call control entity of the network shall either:

   - send a CALL PROCEEDING message to its peer entity to indicate that the call is being processed; and enter the "mobile originating call proceeding" state.

   - or: send an ALERTING message to its peer entity to indicate that alerting has been started at the called user side; and enter the "call received" state.

   - or: send a CONNECT message to its peer entity to indicate that the call has been accepted at the called user side; and enter the "connect request" state.

   The call control entity of the network may insert bearer capability information element(s) in the CALL PROCEEDING message to select options presented by the mobile station in the Bearer Capability information element(s) of the SETUP message. The bearer capability information element(s) shall contain the same parameters as received in the SETUP except those presenting a choice. Where choices were offered, appropriate parameters indicating the results of those choices shall be included.

   The CALL_PROCEEDING message may also contain the priority of the call in the case where eMLPP is applied and where the network has assigned a different priority to the call than that requested by the user, or where the user has not requested a priority and the network has assigned a default priority. Mobile stations supporting eMLPP shall indicate this priority level to higher sublayers and store this information for the duration of the call for further action. Mobile stations not supporting eMLPP shall ignore this information element if provided in a CALL PROCEEDING message.

- The CALL_PROCEEDING message shall contain the multicall supported information in the network call control capabilities in the case where the network supports multicall and there are no other ongoing calls to the MS. Mobile stations supporting multicall shall store this information until the call control state for all calls

returns to null. Mobile stations not supporting multicall shall ignore this information if provided in a CALL PROCEEDING message. If the multicall supported information is not sent in the CALL_PROCEEDING message, the mobile station supporting multicall shall regard that the network doesn't support multicall.

The call control entity of the network having entered the "mobile originating call proceeding" state, the network may initiate the assignment of a traffic channel according to section 5.2.1.9 (early assignment).

For UMTS speech calls no UMTS speech versions shall be included in *bearer capability IE;* if the SETUP includes a list of supported codecs in *Supported Codec List IE* then the network shall use this list to select the required codec type, see Chapter 5.2.1.x. Otherwise the default UMTS AMR speech version shall be assumed.

For a GSM established call the list shall be used by the network for handover to UMTS.

GSM speech versions received by the network in *Bearer Capability* IE. Shall be used by the network for GSM call establishment and handover to GSM. For GSM speech calls where no speech versions are included in *bearer capability IE* the network shall assume GSM speech version 1.

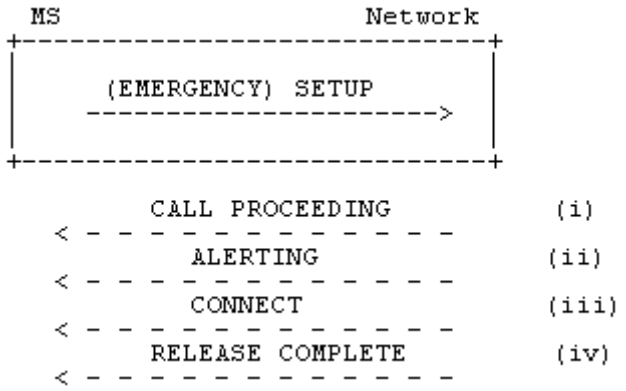

Figure 5.2/TS 24.008 Mobile originated call initiation and possible subsequent responses.

Next Paragraph Changed

5.2.1.X Speech Codec Selection

The network can receive ~~*supported code*~~*Supported Codec List* IE in call establishment messages from the ME to inform the network of the codec types that it supports.

If the network does not receive *Supported Codec List IE* then default UMTS AMR speech version shall be assumed.

The network shall select a codec from the list of codecs and indicate this to the ME via RANAP and RRC protocol in NAS Synchronisation Indicator IE. See TS 25.413 and TS 25.331.

Coding of the codec type shall be according to the last 4 bits of the long form (CoID), as defined in 3G TS 28.062.

The network shall determine the preference for the selected codec type; codec type prioritisation is not provided by the ME.

The ME shall activate the codec type received in the NAS Synchronisation Indicator IE.

If the mobile station does not receive the NAS Synchronisation Indicator IE (RRC protocol) then it shall assume default UMTS AMR speech version.

For adaptive multirate codec types no indication of subsets of modes is supported in this protocol, from the ME or to the ME. It is a pre-condition that the support of such codec types by the ME implicitly includes all modes defined for that codec type.

Next Paragraph Changed

5.2.2.3.1 Response to SETUP

Having entered the "call present state" the call control entity of the mobile station shall - with the exception of the cases described below - acknowledge the SETUP message by a CALL CONFIRMED message, and enter the "mobile terminating call confirmed" state.

If the mobile station supports multicall, it shall include the Stream Identifier (SI) information element in the CALL CONFIRMED message.

- If the mobile station is located in the network supporting multicall, it shall never include the SI that is in use and shall include with either of the following two values:
- SI="no bearer"
- SI=new value (not used by any of the existing bearers)

If the mobile station supporting multicall is located in the network not supporting multicall, it shall include the SI with value 1.

The call control entity of the mobile station may include in the CALL CONFIRMED message to the network one or two bearer capability information elements to the network, either preselected in the mobile station or corresponding to a service dependent directory number (see TS 29.007). The mobile station may also include one or two bearer capabilities in the CALL CONFIRMED message to define the radio channel requirements. For UMTS speech calls no UMTS speech versions shall be included in *bearer capability IE*. For a ME which supports GSM and UMTS and supports more than GSM speech version 1 then speech versions for GSM shall be included in *Bearer Capability* IE. For a UMTS established call these GSM speech versions shall be used by the network for handover to GSM. A ME which supports more than UMTS AMR codec shall include the supported codecs in *Supported Codec List* IE in the CALL CONFIRMED message, otherwise ~~For UMTS speech calls~~ default UMTS AMR speech version shall be assumed. In any case the rules specified in section 9.3.2.2 shall be followed.

NOTE: The possibility of alternative responses (e.g., in connection with supplementary services) is for further study.

A busy MS which satisfies the compatibility requirements indicated in the SETUP message shall respond either with a CALL CONFIRMED message if the call setup is allowed to continue or a RELEASE COMPLETE message if the call setup is not allowed to continue, both with cause #17 "user busy".

If the mobile user wishes to refuse the call, a RELEASE COMPLETE message shall be sent with the cause #21 "call rejected".

In the cases where the mobile station responds to a SETUP message with RELEASE COMPLETE message the mobile station shall release the MM connection and enter the "null" state after sending the RELEASE COMPLETE message.

The network shall process the RELEASE COMPLETE message in accordance with section 5.4.

5.2.2.3.2 Receipt of CALL CONFIRMED and ALERTING by the network

The call control entity of the network in the "call present" state, shall, upon receipt of a CALL CONFIRMED message: stop timer T303, start timer T310 and enter the "mobile terminating call confirmed" state.

In UMTS, network shall include the SI received in the CALL CONFIRMED message into the RABid and send it back to the mobile station. For RABid see TS 25.413. If the network receives the CALL CONFIRMED message with no SI, the network shall set the SI value to 1.

For UMTS speech calls no UMTS speech versions shall be included in *bearer capability IE;* if the CALL CONFIRMED message includes a list of supported codecs in *Supported Codec List IE* then the network shall use this list to select the required codec type, see Chapter 5.2.1.x. If no *Supported Codec List IE* is received by the network then default UMTS AMR speech version shall be assumed.

GSM speech versions received by the network in *Bearer Capability* IE. Shall be used by the network for GSM call establishment and handover to GSM. For GSM speech calls where no speech versions are included in *bearer capability IE* the network shall assume GSM speech version 1.

The call control entity of the mobile station having entered the "mobile terminating call confirmed" state, if the call is accepted at the called user side, the mobile station proceeds as described in 5.2.2.5. Otherwise, if the signal information element was present in the SETUP message user alerting is initiated at the mobile station side; if the signal information element was not present in the SETUP message, user alerting is initiated when an appropriate channel is available.

Here, initiation of user alerting means:

- the generation of an appropriate tone or indication at the mobile station; and
- sending of an ALERTING message by the call control entity of the MS to its peer entity in the network and entering the "call received" state.

The call control entity of the network in the "mobile terminated call confirmed" state shall, upon receipt of an ALERTING message: send a corresponding ALERTING indication to the calling user; stop timer T310; start timer T301, and enter the "call received" state.

In the "mobile terminating call confirmed" state or the "call received" state, if the user of a mobile station is User Determined User Busy then a DISCONNECT message shall be sent with cause #17 "user busy". In the "mobile terminating call confirmed" state, if the user of a mobile station wishes to reject the call then a DISCONNECT message shall be sent with cause #21 "call rejected".

Next Paragraph Changed

5.2.3.2.1 Recall Alignment Procedure

The recall alignment procedure consists of three parts :

- basic service group alignment,
- facility alignment, and
- stream identifier alignment.

Basic service group alignment:

The mobile station shall check that the *Bearer Capability*, *HLC* and *LLC* and *Repeat Indicator* fields, which are embedded in the *Setup Container IE*, match a basic service group supported by the mobile station.

If this check fails, then the recall alignment procedure has failed. The mobile station shall use the cause #88 "incompatible destination" afterwards.

Otherwise, the mobile station is allowed to alter the content within the *Bearer Capability*, *HLC*, ~~and~~ *LLC* and *Supported Codec List* Information Elements (e.g. the speech codec~~r~~ version(s), the data rate, the radio channel requirement) provided that the basic service group is not changed. The result shall be that the mobile station has derived *Bearer Capability*, *HLC* and *LLC* Information Elements, which it can use for a later call setup according to its configuration and capabilities.

Facility alignment:

> This only applies if the *Setup Container* contains 1 or more *Facility IEs.* Each *Facility IE* within the *Setup Container* will be associated with the common *SS Version IE*, if present. The handling for each *Facility IE* is defined below. The mobile station shall align each facility IE contained in the *Setup Container*. The rules defined in GSM 04.10 also apply.

The *Facility IE* is encoded as 'simple recall alignment', 'advanced recall alignment' or 'recall alignment not essential' (see GSM 04.10). If the encoding indicates, that

- a simple recall alignment is required, the mobile station shall copy the Facility IE and the common SS version IE from the *Setup Container* to the SETUP message without modifying the content.
- an advanced recall alignment is required, the mobile station must recognise and support the operation defined in the facility. If the mobile station does not recognise or support the operation, then the recall alignment procedure has failed and the mobile station shall use the cause #29 "facility rejected" in the subsequent rejection of the CC establishment request.
- the recall alignment is not essential, then the facility operation is not an essential part of the SETUP. If the MS does not recognise the operation then the SS Version IE and Facility IE are discarded, and NOT copied into the SETUP message.

NOTE. A mobile station may include a *Facility IE* without an associated *SS Version IE*. This would indicate that the SS operation is encoded using Phase 1 protocols.

Further details on Facility handling are given in GSM 04.10

Stream identifier alignment:

The mobile station shall check whether the *Stream Identifier* field is contained in the *Setup Container* or not.

If the *Stream Identifier* is contained in the *Setup Container*, the mobile station shall behave as one of the following.

- the mobile station re-assign the *Stream Identifier* value, and modify the *Stream Identifier* field.
- the mobile station remove the *Stream Identifier* field.

If the *Stream Identifier* is not contained in the *Setup Container*, the mobile station may behave as follows.

- the mobile station assign the *Stream Identifier* value, and add the *Stream Identifier IE* to the end of the SETUP message.

Next Paragraph Changed

5.2.3.3 CC-Establishment confirmation

The call control entity of the network in the "CC-establishment present" state, shall, upon receipt of a CC-ESTABLISHMENT CONFIRMED message, stop timer T333 and enter the "CC-establishment confirmed" state.

Additionally, for UMTS speech calls a ME which supports more than UMTS AMR codec shall include the list of supported codecs in *Supported Codec List* IE in the ESTABLISHMENT CONFIRMED message.

If a *Supported Codec List* IE is received the network shall use the codec list for codec selection. See 5.2.1.X. If no *Supported Codec List*IE is received by the network then default UMTS AMR is assumed.

In the "CC-establishment confirmed" state, the network sends a RECALL message. This message initiates user alerting and also shall include the Facility IE (providing additional information to be presented to the user for notification). The network starts timer T334 and enters the 'recall present' state.

Upon reception of the RECALL message the Mobile station stops T335 and enters the "recall present" state.

Figure 5.7b/TS 24.008 Recall

5.2.3.4 Recall present

In the "recall present" state, the call control entity in the mobile station waits for acceptance of the Recall by the user. Once confirmation is received, the mobile station indicates acceptance of a recall by

- sending a SETUP message to its peer entity in the network;
- starting Timer T303; and
- entering the "call initiated" state and proceeding as described in section 5.2.1.1.

The MS shall ensure that the contents of the *Bearer Capability IE(*s) and *Supported Codec List* IE sent in the SETUP message are the same as the *Bearer Capability IE(*s) and *Supported Codec List* IE in the previous CC-ESTABLISHMENT CONFIRMED message related to this Network Initiated MO Call.

In the "recall-present" state, if the user of a mobile station is User Determined User Busy then a RELEASE COMPLETE message shall be sent with cause #17 "user busy" In the "recall-present" state. If the user of a mobile station wishes to reject the recall then a RELEASE COMPLETE message shall be sent with cause #21 "call rejected".

In either case, the mobile shall release the connection in accordance with section 5.4.2

On receipt of the SETUP message in the "recall present" state, the network shall stop timer T334 and proceed as specified in section 5.2.1.2.

If the call control entity of the network does not receive a SETUP message before the expiry of timer T334, then the network shall send a RELEASE COMPLETE message to the mobile using cause #102 "recovery on timer expiry", release the MM connection, enter the "null" state and shall inform all appropriate entities within the network.

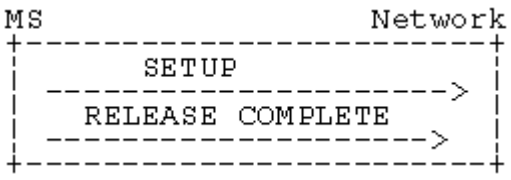

Figure 5.7b/TS 24.008 Recall acceptance or rejection by user

Next Paragraph Changed

5.3 Signalling procedures during the "active" state

5.3.1 User notification procedure

The mobile terminating user notification procedure allows the network to notify a mobile station of any appropriate call-related event during the "active" state of a call. The procedure consists in the network sending a NOTIFY message to the mobile station. No state change occurs at any of the interface sides following the sending or the receipt of this message (but an appropriate indication may optionally be generated in the mobile station).

The mobile originating notification procedure allows the mobile station to notify the remote user of any appropriate call-related event during the "active" state of a call by sending a NOTIFY message containing a notification indicator to the network; upon receipt of this message, the network sends a NOTIFY message containing the same notify indicator to the other user involved in the call. No state change occurs at any of the interface sides following the sending or the receipt of this message.

5.3.2 Call rearrangements

Call rearrangements on the radio interface are not supported by explicit messages (e.g. SUSPEND and RESUME messages as defined in ETS 300 102-1). However if a remote non-PLMN user initiates call rearrangements, the network shall inform the mobile station by means of a NOTIFY message. In a similar way the mobile station can inform the network about rearrangements by sending a NOTIFY message (e.g. change of user equipment connected to the mobile station).

~~5.3.3 Not used~~5.3.3 Codec Change Procedure

If a ME supports more than UMTS AMR speech codec (*Supported Codec List* IE received by the network) the network can modify the codec due to Out Of Band Transcoder Control procedures. If this is the case, the network shall send a codec type in RANAP NAS Synchronisation Indicator IE in order to inform the mobile station to change codec. See 5.2.1.X.

Next Paragraph Changed

5.3.4.3.2 Successful completion of in-call modification

If the destination network/mobile station receives a MODIFY message with a new mode which is already the actual one of the call the network/mobile station shall remain in the "active" state; send a MODIFY COMPLETE message with the actual mode; and shall not initiate anything else.

If the requested mode is a speech mode and the call is UMTS then if the ME supports more than UMTS AMR codec (*Supported Codec List* IE received by the network) then the network shall select a codec from this list, otherwise default UMTS AMR speech version shall be assumed. If a codec is selected other than default AMR, the network shall send the selected codec type to the ME via RANAP NAS Synchronisation Indicator IE (see 5.2.1.X),

If the requested mode is speech and the call is GSM then if speech versions are included in *Bearer Capability IE* then the network shall use these speech versions, if none are included then GSM speech version 1 shall be assumed.

If the requested mode is not the actual one and can be supported by the destination interface it shall change the channel configuration, if required, and step on to any internal resources necessary to support the next call mode. If the requested mode is a data or facsimile mode, it shall also perform the appropriate means to take the direction of the data call into account. After successful change of the channel configuration it shall start sending user information according to the next call mode and start interpreting received user channel information according to the next call mode; send a MODIFY COMPLETE message with the new call mode included and enter the "active" state (mobile station or network side). If the MODIFY message had contained a *reverse call setup direction* IE, the same IE shall be included in the MODIFY COMPLETE message.

In case of an alternate speech/facsimile group 3 service (refer to section 5.3.4) the old resources may still be kept reserved.

Upon receipt of the MODIFY COMPLETE message the originating side shall: initiate the alternation to those resources necessary to support the next call mode; stop timer T323; and enter the "active" state (mobile station or network side). The reaction of the originating side if it had included a reverse call setup direction IE in the MODIFY message, but the destination side did not include the IE in the MODIFY COMPLETE message is implementation dependent.

Next Paragraph Changed

9.3.2 Call confirmed

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

See table 9.56/TS 24.008.

Message type: CALL CONFIRMED

Significance: local

Direction: mobile station to network

Table 9.56/TS 24.008: CALL CONFIRMED message content

IEI	Information element	Type / Reference	Presence	Format	Length
	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	3-16
04	Bearer capability 2	Bearer capability 10.5.4.5	O	TLV	3-16
08	Cause	Cause 10.5.4.11	O	TLV	4-32
15	CC Capabilities	Call Control Capabilities 10.5.4.5a	O	TLV	3
2D	Stream Identifier	Stream Identifier 10.5.4.28	O	TLV	3
40	Supported Codecs	Supported Codec List 10.5.4.xx	O	TLV	5-n

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; Except in the case of UMTS speech where (if no *Supported Codec List* IE is included) default UMTS AMR speech version shall be assumed.

- 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 TS 27.001, 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 TS 27.001.

If the mobile station wishes to indicate capability for an ~~altenative~~alternative call mode, which can be entered during the call through in-call modification, this is indicated by adding a *bearer capability information ele*ment (bearer capability) 2 element (see section 5.3.6).

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.

9.3.2.5 Stream Identifier

This information element shall be included by the mobile station supporting multicall.

9.3.2.6 Supported Codecs

This information element shall be included by the ME for UMTS speech calls for a ME which supports more than UMTS AMR codec types.

Next Paragraph Changed

9.3.8 Emergency setup

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

See table 9.62/TS 24.008.

Message type: EMERGENCY SETUP

Significance: global

Direction: mobile station to network

Table 9.62/TS 24.008: EMERGENCY SETUP message content

IEI	Information element	Type / Reference	Presence	Format	Length
	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
2D	Stream Identifier	Stream Identifier 10.5.4.28	O	TLV	3
40	Supported Codecs	Supported Codec List 10.5.4.xx	O	TLV	5-n

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.

For UMTS speech if no *Supported Codec List* IE is included then the default UMTS AMR speech version shall be assumed.

9.3.8.2 Stream Identifier

This information element shall be included by the mobile station supporting multicall.

9.3.8.3 Supported Codecs

This information element may be included by the mobile station for UMTS speech calls for a ME which supports more than the default UMTS AMR codec type. If this information element is not included then the network shall assume default UMTS AMR speech codec.

Next Paragraph Changed

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/TS 24.008.

Message type: CC-ESTABLISHMENT CONFIRMED

Significance: local

Direction: mobile station to network

Table 9.67b/TS 24.008: CC-ESTABLISHMENT CONFIRMED message content

IEI	Information element	Type / Reference	Presence	Format	Length
	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
40	Supported Codecs	Supported Codec List 10.5.4.xx	O	TLV	5-n

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.

For UMTS speech if no *Supported Codec List* IE is included then the default UMTS AMR speech version shall be assumed.

9.3.17b.3 Cause

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

9.3.17b.4 Supported Codecs

This information element shall be included by the mobile station for UMTS speech calls for a ME which supports more than UMTS AMR codec type.

Next Paragraph Changed

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/TS 24.008.

Message type: SETUP

Significance: global

Direction: mobile station to network

Table 9.70a/TS 24.008: SETUP message content (mobile station to network direction)

IEI	Information element	Type / Reference	Presence	Format	Length
	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	3-16
04	Bearer capability 2	Bearer capability 10.5.4.5	O	TLV	3-16
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	2-18
7C	Low layer compatibility II	Low layer comp. 10.5.4.18	O	TLV	2-18
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-?
2D	Stream Identifier	Stream Identifier 10.5.4.28	O	TLV	3
40	Supported Codecs	Supported Codec List 10.5.4.xx	O	TLV	5-n

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 TS 24.010. This information element should not be transmitted unless explicitly required by TS 24.010.

9.3.23.2.11 CLIR suppression

The information element may be included by the MS (see TS 24.081). 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 TS 24.081). 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.

9.3.23.2.14 Stream Identifier

This information element shall be included by the mobile station supporting multicall.

9.3.23.2.15 Bearer capability 1 and bearer capability 2

If the mobile station wishes to indicate capability for an altenative call mode, which can be entered throughfallback, this is indicated by adding a *bearer capability information ele*ment (bearer capability) 2 element (see section 5.3.6).

9.3.23.2.16 Supported Codecs

This information element shall be included by the mobile station for UMTS speech calls for a ME which supports more than UMTS AMR codec type.

Next Paragraph Changed

10.5.4.x Supported codec list

The purpose of the ~~*Supported codec list*~~*Supported Codec List* information element is to provide the network with information about the speech codecs supported by the mobile.

The *Supported C~~e~~odec List* information element is coded as shown in figure 10.5.xx/TS 24.008.

The *Supported C~~e~~odec List* information element is a type 4 information element with a minimum length of 5 octets and a maximum length of n octets.

8	7	6	5	4	3	2	1	
Supported Codec List IEI								octet 1
Length Of Supported Codec list								octet 2
System Id 1								octet 3
Length Of Bitmap for System Id 1								octet 4
Codec Bitmap for System Id 1, bits 0 to 7								octet 5
Codec Bitmap for System Id 1, bits 8 to 15								octet 6
Codec Bitmap for System Id 1, bits y to y+7								octet j
System Id 2								octet j+1
Length Of Bitmap for System Id 2								octet j+2
Codec Bitmap for System Id 2, bits 0 to 7								octet j+3
Codec Bitmap for System Id 2, bits 8 to 15								octet j+4
Codec Bitmap for System Id 2, bits y to y+7								octet k
System Id x								octet m
Length Of Bitmap for System Id x								octet m+1
Codec Bitmap for System Id x, bits 0 to 7								octet m+2
Codec Bitmap for System Id x, bits 8 to 15								octet m+3
Codec Bitmap for System Id x, bits y to y+7								octet n

Figure 10.5.xx/TS 24.008 Supported codec list information element

Table 10.5.4.xx/TS 24.008: *Supported Codec List* information element

Octet 3, (j+1), m etc
System ID indicates the radio access type for which the proceeding codec types may be used.
Coding of this Octet is defined by the unprotected values used in 3G TS 28.062.

Octet 4, (j+2), m+1 etc
Length Of Codec Bitmap for System ID indicates the number of octets included in the list for the given System ID.

Octets (5 to j), (j+3 to k), (m+2 to n) etc
The coding of the Codec Bitmap is defined in 3G TS 28.062.

3GPP TSG-CN-WG1, Meeting #13
14-18 August, 2000
Vancouver, Canada

Tdoc N1-001010

Title: **Liaison Statement on MS Network Capability IE Conflict**

Source: **3GPP TSG-CN WG1**

TO: **3GPP TSG-SA WG2, 3GPP TSG-CN WG4**

Cc:

WI: **GPRS**

Contact Person:

Name: Apostolis Salkintzis, Motorola
E-mail Address: y1026c@email.mot.com
Tel. Number: +30 93 7158120

Attachments: **N1-001041**

Date: **16th August 2000**

N1 wants to bring to the attention of S2 and N4 that the previous TSGN#8 plenary has approved CR 211r1 to 24.008 (see attached N1-000722). This CR updates the Routing Area Update (RAU) message sent by the MS and, in particular, it appends the MS Network Capability IE to this message. An R99 MS shall include the MS Network Capability IE in every RAU.

This modification of RAU message may introduce some problems during inter-SGSN Routeing Area Updates. This is because the new SGSN will also receive another MS Network Capability IE from the old SGSN in a SGSN Context Response message. The two MS Network Capability IEs may or may not be identical. The suggested method to resolve this problem is to specify that the new SGSN shall ignore the MS Capability IE included in the SGSN Context Response message *only if* an MS Capability IE has already been received in an RAU message. Therefore, it is suggested to give precedence to the MS Network Capability IE sent by the MS.

S2 is kindly asked to study the attached CR to 23.060 (N1-001041) and agree the suggested revisions if they are considered acceptable.

Furthermore, N4 is kindly asked to consider if revisions are required to 3G TS 29.060.

3GPP TSG-CN-WG1, Meeting #13
14-18 August, 2000
Vancouver/Canada

Tdoc N1-001011

Title: **Question about the RRC Flow Id concept**

Source: **TSG-CN WG1**

TO [1]: **TSG-RAN WG2**

Cc:

WI: **GSM / UMTS interworking**

Contact Person:

Name: **Roland Gruber, Siemens AG**
E-mail Address: **roland.gruber@mch.siemens.de**
Tel. Number: **+49 89 722 46392**

Attachments:

(Please list document numbers to be attached)

Date: **16/08/00**

N1 has studied the concept of Flow Id's, contained in the RRC protocol, and would like to raise the following questions and ask RAN2 to comment on any assumptions made by N1:

1. When is a Flow Id to be created?
Is a new Flow Id only to be created for each activated L3 entity which is identified by a separate Protocol Discriminator(PD), or for each call instance, which is identified by a separate Transaction Identifier(TI) within one PD (TI's are used in the CC, SMS, SM entities)?

Based on the definition of the use of the INITIAL DIRECT TRANSFER message it would appear that a new Flow identifier is only to be created for each activated L3 entity (identified by a separate PD).

2. When is a Flow Id released?
According to the current RRC specification it is not clear, when a Flow Id is released. Shall the Flow Id be released locally by the MS and the network when the related L3 entity is deactivated?

Example: CS call and a parallel SMS transfer

1. MM connection	FId_1
2. CC TI_1 call	FId_2
3. SMS transfer	FId_3
4. SMS transfer finalised	? FId_3 released locally?
5. CC TI_1 call released	? FId_2 released locally?

After the release of the call the MM layer is awaiting the release of the signalling connection. Which Flow Ids will be included in the "SIGNALLING CONNECTION RELEASE" message? Only FId_1 or also FId_2 and FId_3?

According to our analysis, it is not possible to indicate the deactivation of a L3 entity, neither on a PD nor on a Flow Id basis on the Iu interface, and because of this N1 assumes that the RNC will not release the Flow Id immediately after the related l3 entity is deactivated, but only if the signalling connection is released.

---

[1] Please write any action required from the groups in a clear way.

3. CN domain identity "Don't care"
According to the current RRC specification it is possible to set the value of the CN domain identity IE to "Don't care" in the INITIAL DIRECT TRANSFER message. N1 would like to ask whether it was the intention of RAN2, that in this case it is up to the RNC to determine which CN domain the NAS message will be routed to?

N1 would like to highlight, that the so called Connection Management(CM-) sublayer entities(CC, SS, SMS, SM) are using the services of the Mobility Management sublayers MM and GMM. Routing a CM message to a CN domain where the related MM context isn't activated would result in the required service not being established by the NAS CN domain and is a contradiction to the NAS protocol architecture.

Conclusion:
According to N1's analysis, there is no normative definition when to create and delete Flow Id's neither in the RAN nor in the NAS 3GPP specifications. N1 would like ask RAN2 for a proposal as to which is the most appropriate specification for such a definition.

3GPP TSG-CN1 Meeting #13

Document N1-001021

Rev of N1-000951

Vancouver/Canada 14-18 August, 2000

e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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

24.008	CR	254r1	Current Version:	3.4.1

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

For submission to: CN#9	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑	for information		non-strategic	X	

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

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

Source: Nokia **Date:** 17.8.2000

Subject: 3.1 kHz multimedia calls at 33.6 kbit/s data rate

Work item: Multimedia

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

Reason for change:

Circuit switched 3.1 kHz multimedia calls in UMTS can be made at rates 28.8 kbit/s and 33.6 kbit/s. The 28.8 kbit/s rate is in practice supported by all networks and terminals offering the 3.1 kHz multimedia service. As for the 33.6 kbit/s rate there are several practical problems:

- The transparent 33.6 kbit/s rate is not specified for all networks (e.g. GSM),
- The 33.6 kbit/s rate is not supported by all terminals,
- The 33.6 kbit/s rate does not work in all digital environments due to the bandwidth limitations of the used PCM codec/filter implementations.

Any of the above mentioned problems causes a failure in the setup phase of a 33.6 kbit/s multimedia call originating from UMTS. The success of a 33.6 kbit/s multimedia call can be guaranteed only if the UMTS user knows the capabilities of the used networks and the called terminal. The user also has to reconfigure parameters at the terminal before making a call.

For this purpose the CR proposes to add an in-call modification procedure for Multimedia Calls, with which the new Fixed Network User Rate can be indicated to the mobile station.

Because existing CS 3.1 kHz multimedia call at rate 33.6 kbit/s can be made usable with this change, therefore it is proposed that this CR is treated as a correction to R99.

Ref. Tdoc N1-000838 (N3-LS to N1).

Clauses affected: Table 10.5

Other specs Other 3G core specifications X → List of CRs: 29.007 (N3-000338), 27.001 (N3-000339),

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

help.doc

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

***** Next modified section *****

5.3.6 Support of multimedia calls

5.3.6.1 Service description

The GSM-UMTS circuit-switched multimedia call is based on the 3G-324M [26.111], which is a 3GPP-variant of the ITU-T H.324 recommendation. CS Multimedia telephony is a Bearer Service, which utilizes the Synchronous Transparent Data service (BS30) [3].

At the multimedia call setup the required call type, 3G-324M, is indicated, for the network to be able to invoke appropriate interworking functionality. In the peer end the H.324 information is used to invoke the terminal application. In addition to H.324 indication the terminal must select Information Transfer Capability (ITC) for the multimedia call. The 'correct' ITC depends on the peer end and the transporting networks; an all-ISDN call is a UDI/RDI call, and a call, which involves PSTN, is an analog '3.1 kHz audio' call.

For the case when the setup of a multimedia call is not successful, fallback to speech is specified.

5.3.6.2 Call establishment

For both mobile originating and mobile terminating calls, the normal call establishment procedures apply, with the exceptions specified in the following sections.

For further description of the function of MSC/IWF in the following sections, see TS 29.007 [38].

5.3.6.2.1 Mobile originated multimedia call establishment

At call setup the required call type, 3G-324M, is indicated by the originating ~~mobile station~~MS in the SETUP message, with the *bearer capability* ~~*information element*~~*IE* parameter Other Rate Adaptation set to 'H.223 and H.245'. The support of a fallback to speech is requested by including also a *bearer capability* ~~*information element*~~*IE 2 with speech indication* in the SETUP message. ~~MSC~~ The network shall examine each mode described in the *bearer capability* ~~*information element*~~*IEs* included in the SETUP message by performing compatibility checking as defined in Annex B. If as a result of this compatibility checking the network decides to reject the call, then the network shall initiate call clearing as specified in section 5.4 with the following causes:

a) #57 "bearer capability not authorized"

b) #58 "bearer capability not presently available"

c) #65 "bearer service not implemented"

d) #70 "only restricted digital information bearer capability is available"

The originating user shall determine (possibly by pre-configuration of the terminal) whether a digital connection is required or if the call will be an analog modem call. If the call is expected to be digital the *bearer capability* ~~*information element*~~*IE* parameter ITC is set to UDI/RDI. In an analog call the *bearer capability* ~~*information element*~~*IE* parameter ITC is set to '3.1kHz audio ex PLMN'. Additionally required modem type is indicated (Other Modem Type = V.34).

5.3.6.2.1.1 Fallback to speech

If the ~~MSC/IWF F~~network, during setup of an analogue H.324-call, detects that the called end does not support a H.324 call, then ~~MSC~~ the network initiates the in-call modification procedure (see section 5.3.4.3) towards the MS~~calling mobile terminal~~ to modify the call mode to speech, if the MS~~calling terminal~~ had included a speech *bearer capability*~~information element~~*IE* in the SETUP message.

NOTE : fallback from digital (UDI) H.324-call to speech is not supported.

5.3.6.2.2 Mobile terminating multimedia call

At call setup the required call type, 3G-324M, is indicated by the ~~MSC~~ network in the SETUP message, with the *bearer capability* ~~*information element*~~*IE* parameter Other Rate Adaptation set to 'H.223 and H.245'. ITC is either '3.1kHz audio ex PLMN' or 'UDI/RDI'. If ~~MSC~~ the network supports fallback to speech, and if the subscriber has subscription to speech, a *bearer capability* ~~*information element*~~*IE 2* with speech indication is included in the SETUP message. *The bearer capability* ~~*information element*~~*IE(s)* may (in the case of the single numbering scheme) be missing from the SETUP-message.

The ~~destination mobile station~~MS shall perform the compatibility checking as defined in Annex B for the required mode(s) if indicated in the SETUP message. If as a result of compatibility checking the ~~mobile station~~MS decides to reject the call, the ~~mobile station~~MS shall initiate call clearing according to the procedures of section 5.4 with one of the following causes:

a) #57 "bearer capability not authorized"

b) #58 "bearer capability not presently available"

c) #65 "bearer service not implemented"

d) #88 "incompatible destination"

The ~~called mobile station~~MS shall indicate the supported call type(s) in the CALL_CONFIRMED-message, which is the acknowledgement to SETUP. The ~~mobile station~~MS has following options for the inclusion of *bearer capability* ~~*information element*~~*IE* in the CALL_CONFIRMED message:

- if the ~~mobile station~~MS/user accepts the offered multimedia call, and supports speech fallback both multimedia and speech *bearer capability* ~~*information element*~~*IEs* shall be included
- if the ~~mobile station~~MS/user accepts the offered multimedia call, but does not support speech fallback only a multimedia *bearer capability* ~~*information element*~~*IE shall be included*
- if the ~~mobile station~~MS/user wishes a speech (only) call a speech *bearer capability* ~~*information element*~~*IE* is included

If the SETUP contained no *bearer capability* ~~*information element*~~*IE* the ~~MSC~~ network shall perform compatibility checking of the CALL CONFIRMED message in the same way as the compatibility checking of the SETUP message in the mobile originating call case, described in section 5.3.6.2.1.

If modem handshaking fails (in a modem call) the call mode will be modified to speech. The modem signalling is inband, so the call must have reached the active state, when these conclusions about the presence of modems can be done. The call modifications are realized through the in-call modification procedure, by which ~~MSC~~ the network requests the ~~mobile station~~MS to modify the call mode ~~traffic channel characteristics~~ (see section 5.3.4.3).

NOTE: ~~F~~fallback from digital (UDI) H.324-call to speech is not supported.

5.3.6.X In-call modification in the "active" state

In order to change the bearer capability for a multimedia call, the following in-call modification procedure shall be used. Following bearer capability parameters can be modified with the procedure (see TS 29.007 [38]):

- Fixed Network User Rate

Only network side of the radio interface may act as the requesting user to invoke the in-call modification.

5.3.6.X.1 Initiation of in-call modification

The procedure is initiated by the network in the "active" state of the call. The network shall send a MODIFY message including *Immediate modification indicator IE* and the new bearer capability to be changed to; start timer T323; and enter the "mobile terminating modify" state. Any internal resources necessary to support the new bearer capability shall be reserved. The MODIFY originating side shall stop sending Bm-channel information; and stop interpreting received Bm-channel information according to the old bearer capability.

Upon receipt of the MODIFY message with *Immediate modification indicator IE*, the MS shall check to ensure that the requested bearer capability can be supported and if so, it shall initiate the reservation of any resources necessary to support the new bearer capability and enter the "mobile terminating modify" state.

5.3.6.X.2 Successful completion of in-call modification

If the MS can support the requested bearer capability the MS shall perform actions defined in TS 27.001 [37]. After successful modifications defined in TS 27.001 [37] the MS shall start sending user information according to the new bearer capability and start interpreting received user channel information according to the new bearer capability; send a MODIFY COMPLETE message with the new bearer capability included and enter the "active" state.

Upon receipt of the MODIFY COMPLETE message the network shall: initiate the alternation to those resources necessary to support the new bearer capability; stop timer T323; and enter the "active" state.

5.3.6.X.3 Failure of in-call modification

5.3.6.X.3.1 MS rejection of in-call modification

If the MS cannot support the requested bearer capability, the MS shall: release any resources which had been reserved for the modification; send a MODIFY REJECT message with the old bearer capability and cause # 58 "bearer capability not presently available", and enter the "active" state.

Upon receipt of the MODIFY REJECT message the network shall: stop timer T323, release any resources which had been reserved for the modification, enter the "active" state and perform activities defined in TS 29.007 [38].

5.3.6.X.3.2 Time-out recovery

Upon expiration of T323 in the network the procedures for call clearing shall be initiated with cause # 102 "recovery on timer expiry".

***** Next modified section *****

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/TS 24.008.

Message type: MODIFY

Significance: global

Direction: both

Table 9.63/TS 24.008: MODIFY message content

IEI	Information element	Type / Reference	Presence	Format	Length
	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	2-15
7C	Low layer comp.	Low layer comp. 10.5.4.18	O	TLV	2-18
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
A4	Immediate modification indicator	Immediate modification indicator 10.5.4.X	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.

9.3.13.X Immediate modification indicator

This information element shall be included if and only if immediate in-call modification is requested.

***** Next modified section *****

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 10.5.88/TS 24.008 and tables 10.5.102/TS 24.008 to 10.5.115/TS 24.008.

The bearer capability is a type 4 information element with a minimum length of 3 octets and a maximum length of 16 octets.

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

Figure 10.5.88/TS 24.008 Bearer capability information element

NOTEs: The coding of the octets of the bearer capability information element is not conforming to ITU Q.931.

An MS shall encode the Bearer Capability infomation element according to GSM call control requirements also if it is requesting for a UMTS service.

For UTRAN access following parameters are irrelevant, because multiple traffic channels (multislot) are not deployed [TS 23.034]. The multislot parameters shall, however, be stored in MSC, and forwarded at handover:

- Maximum number of traffic channels (octet 6e, bits 1-3)
- Acceptable Channel coding(s) (octet 6e, bits 4, 5 and 7)
- UIMI, User initiated modification indication (octet 6f, bits 5-7)
- Acceptable Channel Codings extended (octet 6g, bits 5-7)

A mobile station not supporting GSM shall set these parameters to the value "0".

Table 10.5.102/TS 24.008: Bearer capability information element

Radio channel requirement (octet 3), network to MS direction
In GSM, i.e. not applicable for UMTS data services.

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.

(continued...)

Table 10.5.102/TS 24.008: Bearer capability information element (continued)

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

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 10.5.103/TS 24.008 Bearer capability information element

Octet(s) 3a etc. MS to network direction
Octet(s) 3a etc. shall only be used to convey speech coding information belonging to a GSM Radio Access. When included for a UMTS call establishment they shall be used for handover to a GSM Radio Acess.

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 1 0 0 GSM full rate speech version 3
0 0 0 1 GSM half rate speech version 1
0 1 0 1 GSM half rate speech version 3

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.

Table 10.5.104/TS 24.008: 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)
In GSM, i.e. not applicable for UMTS data services.

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

Table 10.5.105/TS 24.008: 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, I.460/X.30 rate adaptation
1 0 ITU-T 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 reserved: was allocated in earlier phases of the protocol
1 0 0 reserved: was allocated in earlier phases of the protocol.
1 0 1 X.28 - non dedicated PAD
1 1 0 X.32

All other values are reserved.

Table 10.5.106/TS 24.008: 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.
In UMTS, PIAFS shall be considered. In GSM, call shall be rejected if PIAFS requested.

Bit
5 4
0 0 V.120
0 1 H.223 & H.245
1 0 PIAFS

All other values are reserved.

Table 10.5.107/TS 24.008: 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 10.5.108/TS 24.008: 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 10.5.109/TS 24.008: 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)
In GSM only.

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 reserved: was allocated in earlier phases of the protocol.

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 10.5.110/TS 24.008: Bearer capability information element

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

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).
in GSM only.

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)
In GSM only.

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 10.5.111/TS 24.008: 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 (note 1)
0 0 0 1 0 V.22 (note 1)
0 0 0 1 1 V.22 bis (note 1)
0 0 1 0 0 reserved: was allocated in earlier phases of the protocol
0 0 1 0 1 V.26 ter (note 1)
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.
Note 1: In GSM only.

Table 10.5.112/TS 24.008: Bearer capability information element

Other modem type (octet 6d)
Bits
7 6
0 0 no other modem type specified in this field
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) (note 1)
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
0 1 0 0 1 33.6 kbit/s bit transparent (note 2)
0 1 0 1 0 32.0 kbit/s Recommendation I.460 (note 2)
0 1 0 1 1 31.2 kbit/s Recommendation V.34 (note 2)

The value 31.2 kbit/s Recommendation V.34 shall be used only by the network to inform the MS about FNUR modification due to negotiation between the modems in a 3.1 kHz multimedia call.

All other values are reserved.
Note 1: In GSM only.
Note 2: In UMTS only

Table 10.5.113/TS 24.008: 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 10.5.114/TS 24.008: 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 10.5.115/TS 24.008: 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 10.5.115a/TS 24.008: 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
Channel Coding Asymmetry Indication

Bits
4 3
0 0 Channel coding symmetry preferred
1 0 Downlink biased channel coding asymmetry is preferred
0 1 Uplink biased channel coding asymmetry is preferred
1 1 Unused, if received it shall be interpreted as "Channel coding symmetry preferred"

EDGE Channel Codings (octet 6g), network to MS direction:

Bits 3 to 7 are spare and shall be set to "0".

Bits 2 and 1 are spare.

***** Next modified section *****

10.5.4.X Immediate modification indicator

This information element is used to indicate an immediate in-call modification without changing the channel configuration.

The *Immediate modification indicator* information element is coded as shown in figure 10.5.xxx/TS 24.008.

The *Immediate modification indicator* is a type 2 information element

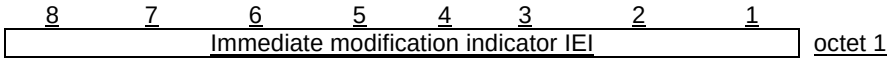

Figure 10.5.xxx/TS 24.008 *Immediate modification indicator* information element

3GPP TSG-CN-WG1, Meeting #13
14-18 August, 2000
Vancouver/Canada

Tdoc N1-001023
Tdoc N1-001022

Title: **Liaison statement on the introduction of GEA2.**

Source: **CN1**

TO: **SA2, TSG CN**

Cc: **CN4, SA3, TSG SA**

WI: **Security**

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Date: **17.08.00**

While studying the possibility to introduce the GPRS ciphering algorithm GEA2 for R97/R98 mobile stations, CN1 detected a problem which occurs on the network side in case of an interworking between R99 and R97/R98 SGSNs. Note that the problem is not tied to the introduction of GEA2 for R97 /R98 mobile stations, but will also exist for a R99 mobile station supporting GEA2 and roaming in a mixed R97/R98 – R99 network environment.

Description of the problem:
A mobile station supporting GEA2 will indicate this capability to the network in the MS network capabilities sent during GPRS attach or routing area update. To this purpose the information element has to be enhanced by an additional octet. According to the draft CR currently under discussion in CN1, a R97/R98 network shall ignore this new octet.

The problem occurs, if a R99 SGSN activated GEA2 and the MS subsequently performs an inter-SGSN routing area update to a R97 /R98 SGSN. As the R97/R98 SGSN does not support GEA2, a new authentication and ciphering procedure has to be performed to change the ciphering algorithm to GEA1. This behaviour is not covered by the current R97/R98 specifications GSM 03.60, 04.08 and 09.60 and cannot be introduced without a functional change to a R97/R98 SGSN. Especially, it is not possible with GTP version 0 to indicate to the R97/R98 SGSN a used ciphering key different from GEA1

The following changes would be necessary to R97/R98 specifications:

GSM 03.60: It has to be described that if during an inter-SGSN routing area update the new SGSN does not know or is not able to support the ciphering algorithm used by the old SGSN, the new SGSN has to change the ciphering algorithm by performing a new authentication and ciphering procedure.

GSM 09.60: In the information element MM Context which is passed from the old to the new SGSN, the range of codepoints for the parameter ‘used cipher’ has to be extended so that ciphering algorithms different from GEA1 can be indicated to the new SGSN without triggering an error handling in the new SGSN.

(Note: CN1 considered also alternative solutions, but all of these require some changes to the R97/R98 SGSN. – Furthermore, it is not possible mandate the R99 SGSN to change the ciphering algorithm to GEA1 before the inter-SGSN routing area update is performed, because the R99 SGSN cannot control when the MS performs the routing area update.)

Conclusion:
Based on this analysis and previous decision in TSGN #8 that functional changes to the R97/R98 SGSN specifications can not be made any more TSGN1 has come to the conclusion that the GEA2 ciphering algorithm can not be activated in mixed R97/R98 – R99 networks but all R97/R98 SGSNs must be updated to R99 first.

TSGN1 is working on R97 and R98 CRs to allow the mobile stations to support GEA2 algorithm.

TSGN1 wish to inform TSG CN and TSGS2 on this decision.

3GPP TSG-CN-WG1, Meeting #13
14 – 18 August. 2000
Vancouver, Canada

Tdoc N1-001027
N1-000893

Source: TSG-CN WG1

To: TSG-CN WG4

Cc: TSG-SA WG2

Title: LS back on Race conditions avoidance

Contact: Fumihiko YOKOTA, Fujitsu Limited
+81 44 754 4196, yokota@ss.ts.fujitsu.co.jp

TSG-CN WG1 thanks for the liaison from TSG-CN WG4 (N4-000340 and N4-000515) on the functional modification of “Teardown indicator” to solve a race condition.

N1 has studied the attached CR (N4-000258) and found a compatibility problem.

Suppose the case that an R98 or earlier MS is attached to a R99 SGSN. When the MS tries to deactivate established PDP context, it sends *Deactivate PDP Context Request* without “Teardown indicator” IE. Then The SGSN sends *Delete PDP Context Request* which will be ignored by the R99 GGSN since it does not includes “Teardown indicator” IE. To solve the problem, SGSN must add “Teardown indicator” IE if the MS is R98 or earlier version but it will increase the complexity of logic in SGSN.

N1 believes that the problem that is tried to solve by the CR is not so critical. The *Activate Secondary PDP Context Request* has a response message that is the *Activate Secondary PDP Context Accept* that confirms successful completion of activation procedure. This means that before receiving the accept message, the completion of the activation procedure is not guaranteed. If an MS were to wait the successful completion of the activation procedure, the problem can be easily avoided. This implementation of MS can be a solution of the situation pointed out by the CR.

In terms of capability of SM protocol, an MS is free to initiate the PDP context deactivation procedure before the addition of secondary PDP context has been completed but it should owe the risk (i.e., sometimes the secondary PDP context activation fails) to itself.

Consequently N1 does not see any special reason to solve the race condition. N1 kindly asks N4 if there is any possibility to reconsider the CR.

3GPP CN WG1 Meeting #13
Vancouver, Canada, 14-18 August 2000

Document N1-001028
Rev of N1-000994

CHANGE REQUEST

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

04.08 **CR** **A1045r1** Current Version: 6.11.0

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

For submission to: TSG CN#9 *list expected approval meeting # here ↑*

For approval [X] for information [ ]

Strategic [X] non-strategic [ ] *(for SMG use only)*

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

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

Source: Ericsson **Date:** 2000-08-15

Subject: Optional support of GEA/2 Encryption Algorithm in the MS

Work item: GPRS

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

F	Correction	[X]	**Release:**	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	[ ]
				Release 00	[ ]

Reason for change:

The support of GEA2 Encryption Algorithm is optional for the MS in R97.

This CR introduces the possibility for the MS to indicate it's support for 7 encryption algorithms in R97 (e.g. the MS network capability IE has been extended with 1 octet in order to handle this).

Furthermore the MS Network Capability IE has been added to the Routing Area Update procedure. This IE shall be included by the MS to indicate it's capabilities to the network, if the MS supports at least one of the GPRS Encryption Algorithm GEA/2 to GEA/7.

A R97 network does not support the GEA2 Encryption Algorithm and will accordingly ignore the new octet in the extended MS network capability IE in the Attach Request message and also the MS Network Capability IE added to the Routing Area Update Request message.

Clauses affected: 9.4.1, 9.4.14, 10.5.5.3, 10.5.5.12

Other specs Affected:

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

Other comments:

9.4.1 Attach request

This message is sent by the MS to the network in order to perform a GPRS or combined GPRS attach. See table 9.4.1/GSM 04.08.

Message type: ATTACH REQUEST

Significance: dual

Direction: MS to network

Table 9.4.1/GSM 04.08: ATTACH 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	½
	Attach request message identity	Message type 10.4	M	V	1
	MS network capability	MS network capability 10.5.5.12	M	LV	2-3
	Attach type	Attach type 10.5.5.2	M	V	½
	GPRS ciphering key sequence number	Ciphering key sequence number 10.5.1.2	M	V	½
	DRX parameter	DRX parameter 10.5.5.6	M	V	2
	P-TMSI or IMSI	Mobile identity 10.5.1.4	M	LV	6 - 9
	Old routing area identification	Routing area identification 10.5.5.15	M	V	6
	MS Radio Access capability	MS Radio Access capability 10.5.5.12a	M	LV	6 – 13
19	Old P-TMSI signature	P-TMSI signature 10.5.5.8	O	TV	4
17	Requested READY timer value	GPRS Timer 10.5.7.3	O	TV	2
9	TMSI status	TMSI status 10.5.5.4	O	TV	1

9.4.1.1 Old P-TMSI signature

This IE is included if a valid P-TMSI and P-TMSI signature are stored in the MS.

9.4.1.2 Requested READY timer value

This IE may be included if the MS wants to indicate a preferred value for the READY timer.

9.4.1.3 TMSI status

This IE shall be included if the MS performs a combined GPRS attach and no valid TMSI is available.

***** New Modification *****

9.4.14 Routing area update request

This message is sent by the MS to the network either to request an update of its location file or to request an IMSI attach for non-GPRS services. See table 9.4.14/GSM 04.08.

Message type: ROUTING AREA UPDATE REQUEST

Significance: dual

Direction: MS to network

Table 9.4.14/GSM 04.08: ROUTING AREA UPDATE 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
	Routing area update request message identity	Message type 10.4	M	V	1
	Update type	Update type 10.5.5.18	M	V	1/2
	GPRS ciphering key sequence number	Ciphering key sequence number 10.5.1.2	M	V	1/2
	Old routing area identification	Routing area identification 10.5.5.15	M	V	6
	MS Radio Access capability	MS Radio Access capability 10.5.5.12a	M	LV	6 - 13
19	Old P-TMSI signature	P-TMSI signature 10.5.5.8	O	TV	4
17	Requested READY timer value	GPRS Timer 10.5.7.3	O	TV	2
27	DRX parameter	DRX parameter 10.5.5.6	O	TV	3
9-	TMSI status	TMSI status 10.5.5.4	O	TV	1
31	MS network capability	MS network capability 10.5.5.12	O	TLV	3-4

9.4.14.1 Old P-TMSI signature

This IE is included by the MS if it was received from the network in an ATTACH ACCEPT or ROUTING AREA UPDATE ACCEPT message.

9.4.14.2 Requested READY timer value

This IE may be included if the MS wants to indicate a preferred value for the READY timer.

9.4.14.3 DRX parameter

This IE may be included if the MS wants to indicate new DRX parameters.

9.4.14.4 TMSI status

This IE shall be included if the MS performs a combined routing area update and no valid TMSI is available.

9.4.14.x MS network capability

This IE shall be included by the MS to indicate it's capabilities to the network, if the MS supports in addition to GEA/1 at least one of the GPRS Encryption Algorithm GEA/2 to GEA/7.

***** New Modification *****

10.5.5.3 Ciphering algorithm

The purpose of the *ciphering algorithm* information element is to specify which ciphering algorithm shall be used.

The *ciphering algorithm* is a type 1 information element.

The *ciphering algorithm* information element is coded as shown in figure 10.5.119/GSM 04.08 and table 10.5.136/GSM 04.08.

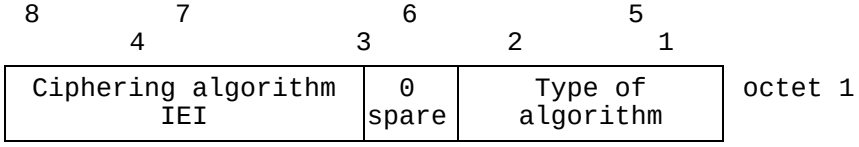

Figure 10.5.119/GSM 04.08: *Ciphering algorithm* information element

Table 10.5.136/GSM 04.08: *Ciphering algorithm* information element

Type of ~~ciphering~~ algorithm (octet 1)
Bits
3 2 1
0 0 0 ciphering not used
0 0 1 GPRS Encryption Algorithm GEA/1
0 1 0 GPRS Encryption Algorithm GEA/2
0 1 1 GPRS Encryption Algorithm GEA/3
1 0 0 GPRS Encryption Algorithm GEA/4
1 0 1 GPRS Encryption Algorithm GEA/5
1 1 0 GPRS Encryption Algorithm GEA/6
1 1 1 GPRS Encryption Algorithm GEA/7

~~All other values are interpreted *reserved* by this version of the protocol.~~

In this version of the protocol the network shall not allocate values other than 000 or 001 to the MS.

***** New Modification *****

10.5.5.12 MS network capability

The purpose of the *MS network capability* information element is to provide the network with information concerning aspects of the mobile station related to GPRS. The contents might affect the manner in which the network handles the operation of the mobile station. The *MS network capability* information indicates general mobile station characteristics and it shall therefore, except for fields explicitly indicated, be independent of the frequency band of the channel it is sent on.

The *MS network capability* is a type 4 information element with a minimum of 3 and a maximum of ~~3~~4 octets length.

Octet 4 shall be included by the MS, if it supports in addition to GEA/1 at least one of the GPRS Encryption Algorithm GEA/2 to GEA/7.
In this version of the protocol the network shall ignore octet 4.

The value part of a *MS network capability*information element is coded as shown in figure 10.5.128/GSM 04.08 and table 10.5.145/GSM 04.08.

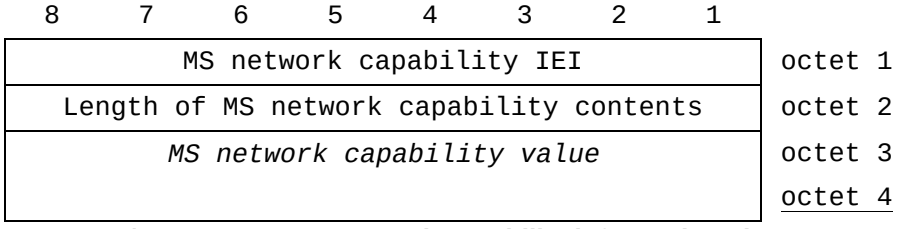

Figure 10.5.128/GSM 04.08: MS network capability information element

Table 10.5.145/GSM 04.08: *MS network capability* information element

<MS network capability value part> ::=

<**GEA1 bits**>
<**SM capabilities via dedicated channels**: bit>
<**SM capabilities via GPRS channels**: bit>
<**UCS2 support**: bit>
<**SS Screening Indicator**: bit string(2)>
<**Spare bits**>
<**Spare bit**>
<**Spare bit**>
<Extended GEA bits>
<**Spare bit**>;

<**GEA1 bits**> ::= < **GEA/1** :bit>;

<Extended GEA bits> ::= <GEA/2:bit><GEA/3:bit>< GEA/4:bit >< GEA/5:bit >< GEA/6:bit ><GEA/7:bit>;

<**Spare bits**> ::= null | {<spare bit> < **Spare bits** >};

SS Screening Indicator

0 0	defined in GSM 04.80
0 1	defined in GSM 04.80
1 0	defined in GSM 04.80
1 1	defined in GSM 04.80

SM capabilities via dedicated channels

0	Mobile station does not support mobile terminated point to point SMS via dedicated signalling channels
1	Mobile station supports mobile terminated point to point SMS via dedicated signalling channels

Table 10.5.145/GSM 04.08: *MS network capability* information element (cont'd)

SM capabilities via GPRS channels

0	Mobile station does not support mobile terminated point to point SMS via GPRS packet data channels
1	Mobile station supports mobile terminated point to point SMS via GPRS packet data channels

UCS2 support

This information field indicates the likely treatment by the mobile station of UCS2 encoded character strings.

0	the ME has a preference for the default alphabet (defined in GSM 03.38) over UCS2.
1	the ME has no preference between the use of the default alphabet and the use of UCS2.

GPRS Encryption Algorithm GEA/1

0 **encryption algorithm** GEA/1**not available**
1 **encryption algorithm** GEA/1 **available**

GPRS Encryption Algorithm GEA/2

0 encryption algorithm **GEA/2** not available
1 encryption algorithm **GEA/2** available

GPRS Encryption Algorithm GEA/3
0 encryption algorithm **GEA/3** not available
1 encryption algorithm **GEA/3** available

GPRS Encryption Algorithm GEA/4
0 encryption algorithm **GEA/4** not available
1 encryption algorithm **GEA/4** available

GPRS Encryption Algorithm GEA/5
0 encryption algorithm **GEA/5** not available
1 encryption algorithm **GEA/5** available

GPRS Encryption Algorithm GEA/6
0 encryption algorithm **GEA/6** not available
1 encryption algorithm **GEA/6** available

GPRS Encryption Algorithm GEA/7
0 encryption algorithm GEA/7 not available
1 encryption algorithm GEA/7 available

3GPP CN WG1 Meeting #13
Vancouver, Canada, 14-18 August 2000

Document N1-001029
Rev of N1-000995

CHANGE REQUEST

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04.08	CR	A1047r1	Current Version:	7.8.0

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

For submission to:	TSG CN#9	For approval	X	Strategic	X	*(for SMG use only)*
list expected approval meeting # here ↑		for information		non-strategic		

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

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

Source: Ericsson **Date:** 2000-08-17

Subject: Optional support of GEA/2 Encryption Algorithm in the MS

Work item: GPRS

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

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

Reason for change:

The support of GEA2 Encryption Algorithm is optional for the MS in R98.

This CR introduces the possibility for the MS to indicate it's support for 7 encryption algorithms in R98 (e.g. the MS network capability IE has been extended with 1 octet in order to handle this).

Furthermore the MS Network Capability IE has been added to the Routing Area Update procedure. This IE shall be included by the MS to indicate it's capabilities to the network, if the MS supports at least one of the GPRS Encryption Algorithm GEA/2 to GEA/7.

A R98 network does not support the GEA2 Encryption Algorithm and will accordingly ignore the new octet in the extended MS network capability IE in the Attach Request message and also the MS Network Capability IE added to the Routing Area Update Request message.

Clauses affected: 9.4.1, 9.4.14, 10.5.5.12

Other specs Affected:

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

Other comments:

9.4 GPRS Mobility Management Messages

9.4.1 Attach request

This message is sent by the MS to the network in order to perform a GPRS or combined GPRS attach. See table 9.4.1/GSM 04.08.

Message type: ATTACH REQUEST

Significance: dual

Direction: MS to network

Table 9.4.1/GSM 04.08: ATTACH 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	½
	Attach request message identity	Message type 10.4	M	V	1
	MS network capability	MS network capability 10.5.5.12	M	LV	2-3
	Attach type	Attach type 10.5.5.2	M	V	½
	GPRS ciphering key sequence number	Ciphering key sequence number 10.5.1.2	M	V	½
	DRX parameter	DRX parameter 10.5.5.6	M	V	2
	P-TMSI or IMSI	Mobile identity 10.5.1.4	M	LV	6 - 9
	Old routing area identification	Routing area identification 10.5.5.15	M	V	6
	MS Radio Access capability	MS Radio Access capability 10.5.5.12a	M	LV	6 - 13
19	Old P-TMSI signature	P-TMSI signature 10.5.5.8	O	TV	4
17	Requested READY timer value	GPRS Timer 10.5.7.3	O	TV	2
9-	TMSI status	TMSI status 10.5.5.4	O	TV	1

9.4.1.1 Old P-TMSI signature

This IE is included if a valid P-TMSI and P-TMSI signature are stored in the MS.

9.4.1.2 Requested READY timer value

This IE may be included if the MS wants to indicate a preferred value for the READY timer.

9.4.1.3 TMSI status

This IE shall be included if the MS performs a combined GPRS attach and no valid TMSI is available.

***** New Modification *****

9.4.14 Routing area update request

This message is sent by the MS to the network either to request an update of its location file or to request an IMSI attach for non-GPRS services. See table 9.4.14/GSM 04.08.

Message type: ROUTING AREA UPDATE REQUEST

Significance: dual

Direction: MS to network

Table 9.4.14/GSM 04.08: ROUTING AREA UPDATE 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
	Routing area update request message identity	Message type 10.4	M	V	1
	Update type	Update type 10.5.5.18	M	V	1/2
	GPRS ciphering key sequence number	Ciphering key sequence number 10.5.1.2	M	V	1/2
	Old routing area identification	Routing area identification 10.5.5.15	M	V	6
	MS Radio Access capability	MS Radio Access capability 10.5.5.12a	M	LV	6 - 13
19	Old P-TMSI signature	P-TMSI signature 10.5.5.8	O	TV	4
17	Requested READY timer value	GPRS Timer 10.5.7.3	O	TV	2
27	DRX parameter	DRX parameter 10.5.5.6	O	TV	3
9-	TMSI status	TMSI status 10.5.5.4	O	TV	1
31	MS network capability	MS network capability 10.5.5.12	O	TLV	3-4

9.4.14.1 Old P-TMSI signature

This IE is included by the MS if it was received from the network in an ATTACH ACCEPT or ROUTING AREA UPDATE ACCEPT message.

9.4.14.2 Requested READY timer value

This IE may be included if the MS wants to indicate a preferred value for the READY timer.

9.4.14.3 DRX parameter

This IE may be included if the MS wants to indicate new DRX parameters.

9.4.14.4 TMSI status

This IE shall be included if the MS performs a combined routing area update and no valid TMSI is available.

9.4.14.x MS network capability

This IE shall be included by the MS to indicate it's capabilities to the network, if the MS supports in addition to GEA/1 at least one of the GPRS Encryption Algorithm GEA/2 to GEA/7.

***** New Modification *****

10.5.5.3 Ciphering algorithm

The purpose of the *ciphering algorithm* information element is to specify which ciphering algorithm shall be used.

The *ciphering algorithm* is a type 1 information element.

The *ciphering algorithm* information element is coded as shown in figure 10.5.119/GSM 04.08 and table 10.5.136/GSM 04.08.

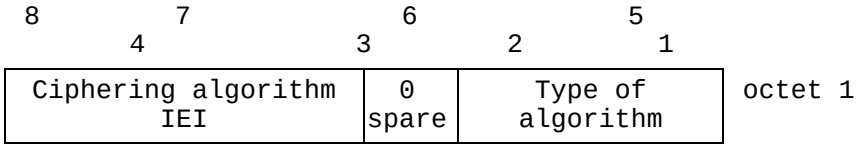


Figure 10.5.119/GSM 04.08: *Ciphering algorithm* information element

Table 10.5.136/GSM 04.08: *Ciphering algorithm* information element

Type of ~~ciphering~~ algorithm (octet 1)
Bits
3 2 1
0 0 0 ciphering not used
0 0 1 GPRS Encryption Algorithm GEA/1
0 1 0 GPRS Encryption Algorithm GEA/2
0 1 1 GPRS Encryption Algorithm GEA/3
1 0 0 GPRS Encryption Algorithm GEA/4
1 0 1 GPRS Encryption Algorithm GEA/5
1 1 0 GPRS Encryption Algorithm GEA/6
1 1 1 GPRS Encryption Algorithm GEA/7

~~All other values are interpreted *reserved* by this version of the protocol.~~

In this version of the protocol the network shall not allocate values other than 000 or 001 to the MS.

***** New Modification *****

10.5.5.12 MS network capability

The purpose of the *MS network capability* information element is to provide the network with information concerning aspects of the mobile station related to GPRS. The contents might affect the manner in which the network handles the operation of the mobile station. The *MS network capability* information indicates general mobile station characteristics and it shall therefore, except for fields explicitly indicated, be independent of the frequency band of the channel it is sent on.

The *MS network capability* is a type 4 information element with a minimum of 3 and a maximum of ~~3~~4 octets length.

Octet 4 shall be included by the MS, if it supports in addition to GEA/1 at least one of the GPRS Encryption Algorithm GEA/2 to GEA/7.
In this version of the protocol the network shall ignore octet 4.

The value part of a *MS network capability*information element is coded as shown in figure 10.5.128/GSM 04.08 and table 10.5.145/GSM 04.08.

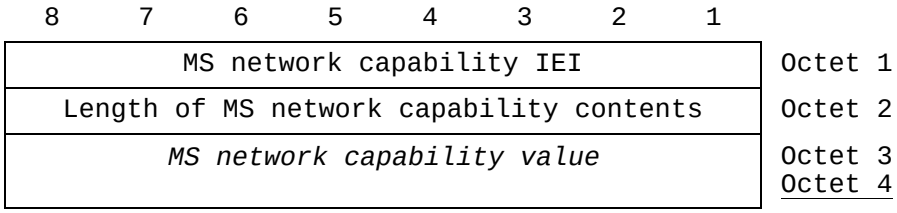


Figure 10.5.128/GSM 04.08: MS network capability information element

Table 10.5.145/GSM 04.08: *MS network capability* information element

<MS network capability value part> ::=

<**GEA1 bits**>
<**SM capabilities via dedicated channels**: bit>
<**SM capabilities via GPRS channels**: bit>
<**UCS2 support**: bit>
<**SS Screening Indicator**: bit string(2)>
<SoLSA Capability : bit>
<**Spare bits**>
<Spare bit>
<Extended GEA bits>
<**Spare bit**>;

<**GEA1 bits**> ::= < **GEA/1** :bit>;

<Extended GEA bits> ::= <GEA/2:bit><GEA/3:bit>< GEA/4:bit >< GEA/5:bit >< GEA/6:bit ><GEA/7:bit>;

<**Spare bits**> ::= null | {<spare bit> < **Spare bits** >};

SS Screening Indicator

0 0 defined in GSM 04.80
0 1 defined in GSM 04.80
1 0 defined in GSM 04.80
1 1 defined in GSM 04.80

SM capabilities via dedicated channels

0 Mobile station does not support mobile terminated point to point SMS via dedicated signalling channels
1 Mobile station supports mobile terminated point to point SMS via dedicated signalling channels

SM capabilities via GPRS channels

0 Mobile station does not support mobile terminated point to point SMS via GPRS packet data channels
1 Mobile station supports mobile terminated point to point SMS via GPRS packet data channels

UCS2 support

This information field indicates the likely treatment by the mobile station of UCS2 encoded character strings.

0 the ME has a preference for the default alphabet (defined in GSM 03.38) over UCS2.
1 the ME has no preference between the use of the default alphabet and the use of UCS2.

GPRS Encryption Algorithm GEA/1

0 encryption algorithm **GEA/1**not available
1 encryption algorithm **GEA/1** available

SoLSA Capability

0 The ME does not support SoLSA.
1 The ME supports SoLSA.

GPRS Encryption Algorithm GEA/2

0 encryption algorithm **GEA/2** not available
1 encryption algorithm **GEA/2** available

GPRS Encryption Algorithm GEA/3

0 encryption algorithm **GEA/3** not available
1 encryption algorithm **GEA/3** available

GPRS Encryption Algorithm GEA/4

0 encryption algorithm **GEA/4** not available
1 encryption algorithm **GEA/4** available

GPRS Encryption Algorithm GEA/5
0 encryption algorithm **GEA/5** not available
1 encryption algorithm **GEA/5** available

GPRS Encryption Algorithm GEA/6
0 encryption algorithm **GEA/6** not available
1 encryption algorithm **GEA/6** available

GPRS Encryption Algorithm GEA/7
0 encryption algorithm GEA/7 not available
1 encryption algorithm GEA/7 available

3GPP-CN1 Meeting #13
Vancouver/Canada, 14-18 August 2000

Document ***N1-001031***
revised N1-001002
revised N1-000966
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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

23.060	CR	??? r2	Current Version:	3.4.0

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

For submission to: TSG SA#9	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑	for information		non-strategic		

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

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

Source: BT, Siemens AG **Date:** 2000-08-10

Subject: Clarification to Service Request procedure

Work item: GSM-UMTS Interworking

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

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

Reason for change:

This CR proposes:

- If the Service Request procedure was initiated when MS is in PMM-CONNECTED mode, then the receipt of the Service Accept message in the MS will lead to a successful completion of the procedure.

Clauses affected: 6.12.1

Other specs affected:

Other 3G core specifications	X	→ List of CRs:	TS 24.008 CR 244 r2
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

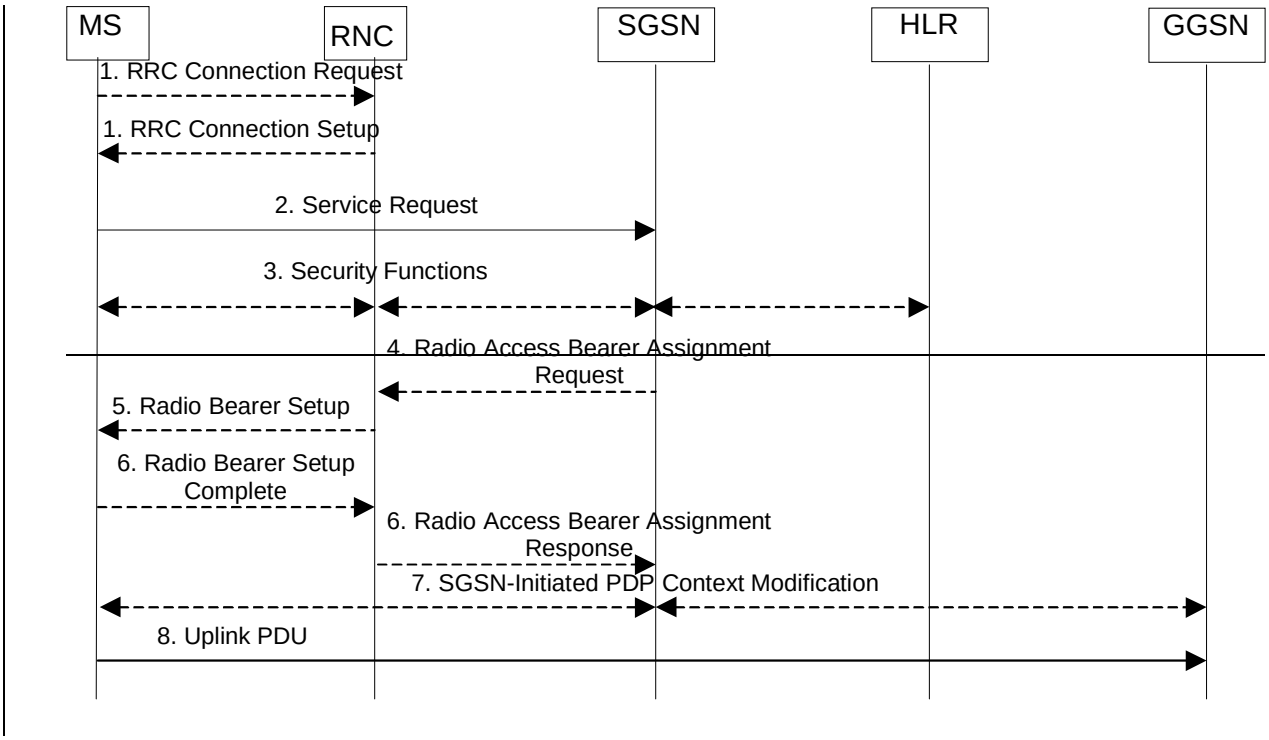
Other comments:

6.12 Service Request Procedure (UMTS Only)

The Service Request procedure is used by a 3G-MS in PMM-IDLE state to request the establishment of a secure connection to a 3G-SGSN. The MS in PMM-IDLE state initiates this procedure in order to send uplink signalling messages (e.g., Activate PDP Context Request), user data, or as paging response. This procedure is also used by an MS in PMM-CONNECTED state to request resource reservation for active PDP contexts.

6.12.1 Service Request Initiated by MS Procedure

The MS in PMM-IDLE state sends the Service Request message to the 3G-SGSN in order to establish the PS signalling connection for the upper layer signalling or for the resource reservation for active PDP context(s). After receiving the Service Request message the 3G-SGSN may perform authentication and it shall perform the security mode procedure. After the establishment of the secure PS signalling connection to a 3G-SGSN the MS may send signalling messages, e.g., Activate PDP Context Request, to the 3G-SGSN, or the 3G-SGSN may start the resource reservation for the active PDP contexts depending on the requested service in the Service Request message. This procedure is also used by an MS in PMM-CONNECTED state to request the resource reservation for the active PDP contexts.



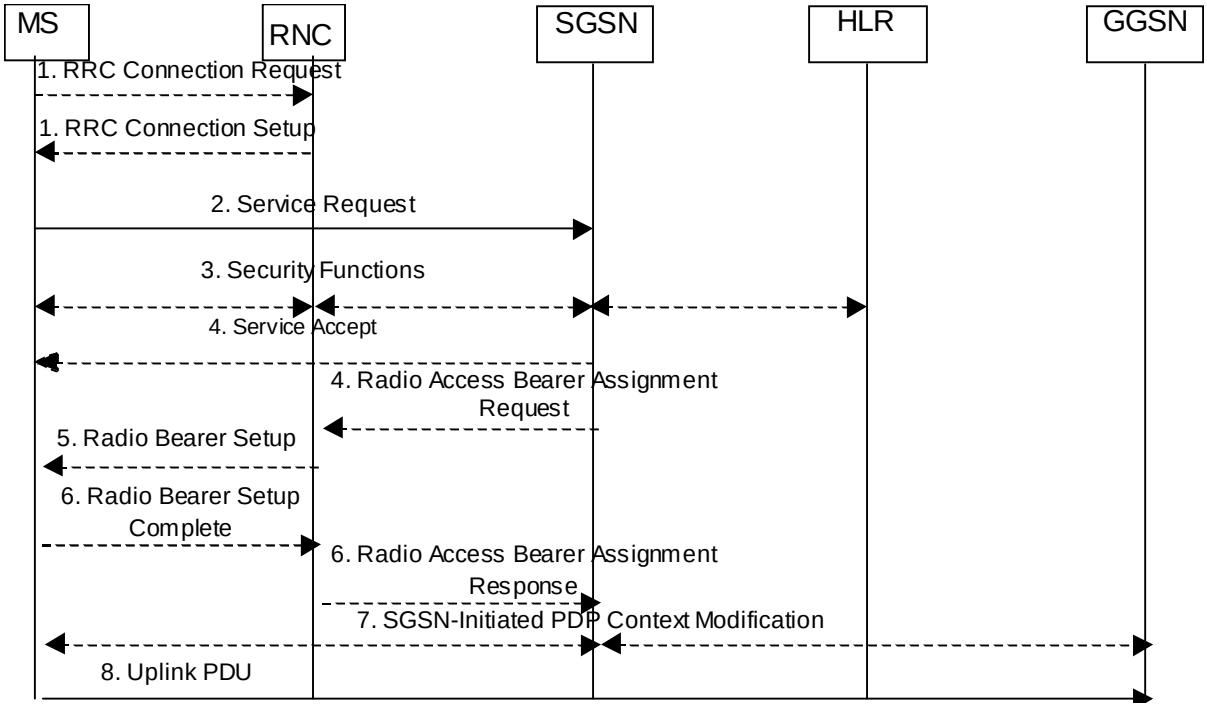


Figure 1: Service Request Initiated by MS Procedure

1) The MS establishes an RRC connection, if none exists for CS traffic.

2) The MS sends a Service Request (P-TMSI, RAI, CKSN, Service Type) message to the SGSN. Service Type specifies the requested service. Service Type shall indicate one of the following: Data or Signalling. At this point, the SGSN may perform the authentication procedure.

   If Service Type indicates Data then a signalling connection is established between the MS and the SGSN, and resources for active PDP context(s) are allocated, i.e., RAB establishment for the activated PDP context(s).

   If Service Type indicates Signalling then the signalling connection is established between the MS and the SGSN for sending upper-layer signalling messages, e.g., Activate PDP Context Request. The resources for active PDP context(s) are not allocated.

3) The SGSN shall perform the security functions if the service request was initiated by an MS in PMM-IDLE state.

4) If the network is in PMM-CONNECTED state and the Service Type indicates Data, the SGSN shall respond with a Service Accept message towards the MS, in case the service request can be accepted. In case Service Type indicates Data, the SGSN sends a Radio Access Bearer Assignment Request (NSAPIRAB ID(s), TEID(s), QoS Profile(s), SGSN IP Address(es)) message to re-establish radio access bearer for every activated PDP context.

5) The RNC indicates to the MS the new Radio Bearer Identity established and the corresponding RAB ID with the RRC radio bearer set up procedure.

6) SRNC responds with the Radio Access Bearer Assignment Response (RAB ID(s), TEID(s), QoS Profile(s), RNC IP Address(es)) message. The GTP tunnel(s) are established on the Iu interface. If the RNC returns a Radio Access Bearer Assignment Response message with a cause indicating that the requested QoS profile(s) can not be provided, e.g., "Requested Maximum Bit Rate not Available", then the SGSN may send a new Radio Access Bearer Assignment Request message with different QoS profile(s). The number of re-attempts, if any, as well as how the new QoS profile(s) values are determined is implementation dependent.

7) For each RAB re-established with a modified QoS profile, the SGSN initiates a PDP Context Modification procedure to inform the MS and the GGSN of the new negotiated QoS profile for the corresponding PDP context.

8) The MS sends the uplink packet.

For Service Type = Signalling, the MS knows that the Service Request message was successfully received in the SGSN when the MS receives the RRC Security Mode Control Command message.

For Service Type = Data, in PMM-IDLE, the MS knows that the Service Request was successfully received when the MS receives the ~~Radio Bearer Setup~~ RRC Security Mode Control Command message from the RNC~~.~~; in PMM-CONNECTED state, the MS knows that the Service Request was successfully received when the MS receives the Service Accept message.

Note: The reception of the Service Accept message does not imply the successful re-establishment of the RAB(s).

For any Service Type, in case the service request cannot be accepted, the network returns a Service Reject message to the MS with an appropriate cause value.

For Service Type = Data, in case the SGSN fails to re-establish RAB(s) for the PDP context(s), the SGSN determines if an SM procedure, such as SGSN-Initiated PDP Context Modification or PDP Context Deactivation, should be initiated. The appropriate action depends on the QoS profile of the PDP context and is an operator choice.

3GPP TSG-CN-WG1, Meeting #13
14-18 August, 2000
Vancouver/Canada

Tdoc N1-001038
N1-000972

Title: Response to LS on timing between RAB Assignment Response and user data

Source: **CN WG1**

TO [1]: **RAN WG3, SA WG2**

Cc: **RAN WG2**

WI: **GSM – UMTS interworking**

Contact Person:

Name: **Per Johan Jørgensen**
E-mail Address: etopj@eto.ericsson.se
Tel. Number: **+47 37293076**

Attachments: **N1-000592, N1-000832**

Date: **18. August 2000**

TSG CN WG1 would like to thank RAN WG3 and SA WG2 for their Liaision Statements (N1-000592/ / R3-000887 and N1-000832 / S2-000951).
R3 is asking the view of N1and S2 regarding when user data can be received in SGSN from the RNC, related to the RAB Assignment procedure.

The response from S2 is shared by N1 for the normal case of RAB establishment,- it is assumed that the user plane connection needs to be available only after the completion of the RAB Assignment procedure, i.e. user data will not arrive in the SGSN prior to receiving the RAB Assignment Response message.

In the case of re-establishment of a RAB, the view of N1 (same as was from S2) is that the SGSN must be prepared to receive uplink user data before the RAB Assignment Response message has been received,- and that the earliest point in time will be after the MS has responded with RB Setup Complete.

N1 can now confirm that 'Service Accept' message is used in some cases of re-establishment of a RAB or RABs. But 'Service Accept' message is not repetitive and is only a completion of the GMM procedure (to stop the timer), with no relation to the completion of RAB(s).

[1] Please write any action required from the groups in a clear way.

3GPP TSG-CN-WG1, Meeting #13
14-18 August, 2000
Vancouver/Canada

Tdoc N1-001039
Revision of N1-000977

Title: **LS on missing definition of high quality signal for UMTS and on comparing UMTS and GSM signal quality.**

Source: **TSG-CN WG1**

TO [1]: **TSG-RAN WG2**

Cc: **TSG-RAN WG4**

WI: **GSM / UMTS interworking**

Contact Person:

Name: **Olivier Irac, Ericsson**
E-mail Address: **olivier.irac@eml.ericsson.se**
Tel. Number: **+44 1256 864865**

Attachments:

(Please list document numbers to be attached)

Date: **18/08/00**

The PLMN selection procedure uses a signal quality level “High quality signal” for automatic and manual selection.

In automatic mode, if the RPLMN, the HPLMN and no preferred PLMN stored in the SIM can be found, the MS shall first select randomly among the PLMN/AS having signal quality above this “high signal quality” limit. Then, if no PLMN/AS above the limit can be found, the MS shall select among PLMN/AS having signal quality lower than the limit in decreasing signal quality.

In manual mode the same order applies to the list displayed to the user.

(The detailed description of the PLMN selection procedure can be found in the specification 3G TS 23.122 V3.3.0)

Because of the split of the GSM 03.22 specification in NAS and AS parts, the PLMN selection procedure described in the NAS part (3G TS 23.122) relies on the definition of this “high quality signal” in the appropriate AS specifications.

To N1 knowledge, this “high quality signal” level has not yet been defined for the UMTS access technology.

N1 asks R2 to define this “high quality signal” level for the UMTS access technology in the appropriate AS specification, as part of the release 99 of the specifications.

Also, in order to be able to select the PLMN/AS having a signal quality lower than the “high signal quality” limit in decreasing signal quality order, the MS has to be able to compare a GSM signal quality with a UMTS signal quality. This might prove difficult if the GSM signal quality is measured in dBm and UMTS in FER. N1 asks R2 to confirm that a way to compare GSM and UMTS signal quality is specified in the release 99 of the AS specifications.

---

[1] Please write any action required from the groups in a clear way.

3GPP TSG-CN-WG1, Meeting #13
14-18 August, 2000
Vancouver/Canada

Tdoc N1-001040
Tdoc N1-000~~981~~

Title: **Answer to LS on 2G/3G QoS profiles**

Source: **CN1**

TO [1]: **SA5**

Cc: **SA2**

WI: **QoS**

Contact Person:

Name: Dieter Jacobsohn
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Tel. Number:+49 228 936 3361

Attachments:

(Please list document numbers to be attached)

Date: **15.08.2000**

CN1 Thanks SA5 for the Liasion statement and would like to give the following background for QoS IE coding:

CN1 has decided, that for compatibility reasons the 2G and 3G QoS parameter are both available in the QOS IE. To ensure the backwards compatibility with the older versions of the protocol, the 2G GSM GPRS QoS parameters (the first 5 octets) were kept in the IE when adding the 3G QoS contents.

A 2G mobile or network would ignore the 3G informations. An implementation (either network or ME) which supports the 3G QoS coding should use primarily the 3G related QoS octets.

The 24.008 has to be compatible with all earlier versions of the protocol.
The 23.107 is a 3G specification only and therefore no comparable.

The existing inconsistencies between 23.107 and the 3G part of QoS IE in 24.008 will be clarified between SA2 and CN1.

[1] Please write any action required from the groups in a clear way.

3GPP-CN1/SMG3WPA Meeting #13
Vancouver, Canada, 14-18 August, 2000

***Document* N1-001041**
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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

23.060	CR	????	Current Version:	3.4.0

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

For submission to:	TSGS#9	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

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

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

Source: Motorola **Date:** Aug. 16, 2000

Subject: Resolve of MS Network Capability Conflict

Work item: GPRS

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

Reason for change:

CR 211r1 to 24.008 revises the Routing Area Update (RAU) message sent by the MS and, in particular, it appends the MS Network Capability IE to this message.

This modification of RAU message may introduce some problems during inter-SGSN Routeing Area Updates. This is because the new SGSN will also receive another MS Network Capability IE from the old SGSN in a SGSN Context Response message. The two MS Network Capability IEs may or may not be identical.

To resolve this problem, this CR proposes to specify that the new SGSN shall ignore the MS Capability IE included in the SGSN Context Response message *only if* an MS Capability IE has already been received in an RAU message. Therefore, it is suggested to give precedence to the MS Network Capability IE sent by the MS.

Clauses affected: 6.9.1.2.2, 6.9.1.3.2, 6.9.2.1, 6.13.2.1, 6.13.2.2

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

Other comments:


help.doc

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

6.9.1.2.2 Inter SGSN Routeing Area Update

The Inter SGSN Routeing Area Update procedure is illustrated in Figure 1.

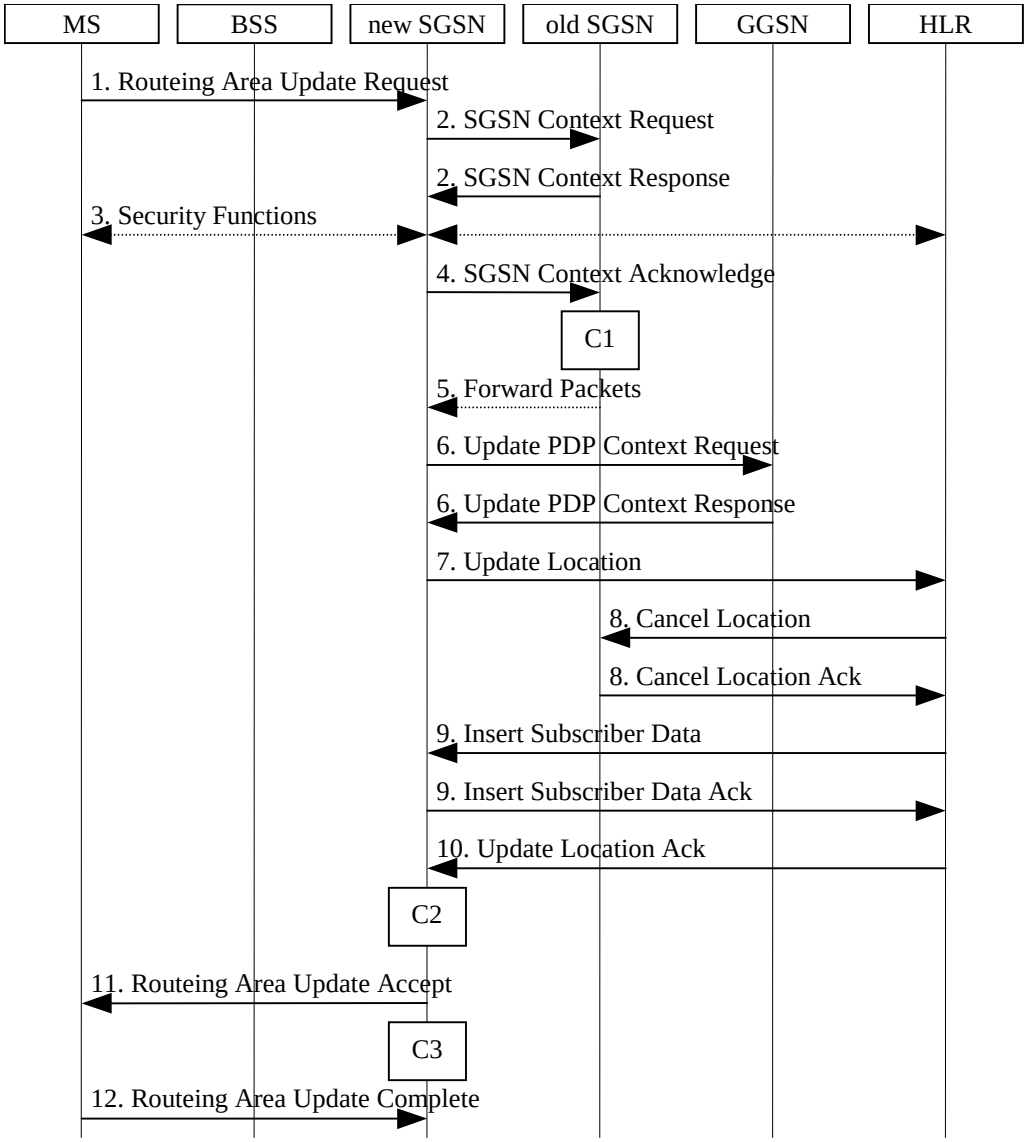

Figure 1: Inter SGSN Routeing Area Update Procedure

1) The MS sends a Routeing Area Update Request (old RAI, old P-TMSI Signature, Update Type, MS Network Capability) to the new SGSN. Update Type shall indicate RA update or periodic RA update. The BSS shall add the Cell Global Identity including the RAC and LAC of the cell where the message was received before passing the message to the SGSN.

2) The new SGSN sends SGSN Context Request (old RAI, TLLI, old P-TMSI Signature, New SGSN Address) to the old SGSN to get the MM and PDP contexts for the MS. The old SGSN validates the old P-TMSI Signature and responds with an appropriate error cause if it does not match the value stored in the old SGSN. This should initiate the security functions in the new SGSN. If the security functions authenticate the MS correctly, the new SGSN shall send an SGSN Context Request (old RAI, TLLI, MS Validated, New SGSN Address) message to the old SGSN. MS Validated indicates that the new SGSN has authenticated the MS. If the old P-TMSI Signature was valid or if the new SGSN indicates that it has authenticated the MS, the old SGSN stops assigning SNDCP N-PDU numbers to downlink N-PDUs received, and responds with SGSN Context Response (MM Context, PDP Contexts). If the MS is not known in the old SGSN, the old SGSN responds with an appropriate error cause. The old SGSN stores New SGSN Address, to allow the old SGSN to forward data packets to the new SGSN. Each PDP Context includes the SNDCP Send N-PDU Number for the next downlink N-PDU to be sent in acknowledged mode to the MS, the SNDCP Receive N-PDU Number for the next uplink N-PDU to be received in acknowledged mode from the MS, the GTP sequence number for the next downlink N-PDU to be sent to the MS and the GTP sequence number for the next uplink N-PDU to be tunnelled to the GGSN. The old

SGSN starts a timer and stops the transmission of N-PDUs to the MS. The new SGSN shall ignore the MS Network Capability contained in MM Context of SGSN Context Response only when it has previously received an MS Network Capability in the Routeing Area Request.

3) Security functions may be executed. These procedures are defined in subclause "Security Function". Ciphering mode shall be set if ciphering is supported.

4) The new SGSN sends an SGSN Context Acknowledge message to the old SGSN. This informs the old SGSN that the new SGSN is ready to receive data packets belonging to the activated PDP contexts. The old SGSN marks in its context that the MSC/VLR association and the information in the GGSNs and the HLR are invalid. This triggers the MSC/VLR, the GGSNs, and the HLR to be updated if the MS initiates a routeing area update procedure back to the old SGSN before completing the ongoing routeing area update procedure. If the security functions do not authenticate the MS correctly, then the routeing area update shall be rejected, and the new SGSN shall send a reject indication to the old SGSN. The old SGSN shall continue as if the SGSN Context Request was never received.

5) The old SGSN duplicates the buffered N-PDUs and starts tunnelling them to the new SGSN. Additional N-PDUs received from the GGSN before the timer described in step 2 expires are also duplicated and tunnelled to the new SGSN. N-PDUs that were already sent to the MS in acknowledged mode and that are not yet acknowledged by the MS are tunnelled together with the SNDCP N-PDU number. No N-PDUs shall be forwarded to the new SGSN after expiry of the timer described in step 2.

6) The new SGSN sends Update PDP Context Request (new SGSN Address, TEID, QoS Negotiated) to the GGSNs concerned. The GGSNs update their PDP context fields and return Update PDP Context Response (TEID).

7) The new SGSN informs the HLR of the change of SGSN by sending Update Location (SGSN Number, SGSN Address, IMSI) to the HLR.

8) The HLR sends Cancel Location (IMSI, Cancellation Type) to the old SGSN with Cancellation Type set to Update Procedure. If the timer described in step 2 is not running, then the old SGSN removes the MM and PDP contexts. Otherwise, the contexts are removed only when the timer expires. This allows the old SGSN to complete the forwarding of N-PDUs. It also ensures that the MM and PDP contexts are kept in the old SGSN in case the MS initiates another inter SGSN routeing area update before completing the ongoing routeing area update to the new SGSN. The old SGSN acknowledges with Cancel Location Ack (IMSI).

9) The HLR sends Insert Subscriber Data (IMSI, GPRS Subscription Data) to the new SGSN. The new SGSN validates the MS's presence in the (new) RA. If due to regional subscription restrictions the MS is not allowed to be attached in the RA, the SGSN rejects the Routeing Area Update Request with an appropriate cause, and may return an Insert Subscriber Data Ack (IMSI, SGSN Area Restricted) message to the HLR. If all checks are successful then the SGSN constructs an MM context for the MS and returns an Insert Subscriber Data Ack (IMSI) message to the HLR.

10) The HLR acknowledges the Update Location by sending Update Location Ack (IMSI) to the new SGSN.

11) The new SGSN validates the MS's presence in the new RA. If due to roaming restrictions the MS is not allowed to be attached in the SGSN, or if subscription checking fails, then the new SGSN rejects the routeing area update with an appropriate cause. If all checks are successful then the new SGSN constructs MM and PDP contexts for the MS. A logical link is established between the new SGSN and the MS. The new SGSN responds to the MS with Routeing Area Update Accept (P-TMSI, P-TMSI Signature, Receive N-PDU Number). Receive N-PDU Number contains the acknowledgements for each acknowledged-mode NSAPI used by the MS, thereby confirming all mobile-originated N-PDUs successfully transferred before the start of the update procedure.

12) The MS acknowledges the new P-TMSI by returning a Routeing Area Update Complete (Receive N-PDU Number) message to the SGSN. Receive N-PDU Number contains the acknowledgements for each acknowledged-mode NSAPI used by the MS, thereby confirming all mobile-terminated N-PDUs successfully transferred before the start of the update procedure. If Receive N-PDU Number confirms reception of N-PDUs that were forwarded from the old SGSN, then these N-PDUs shall be discarded by the new SGSN. LLC and SNDCP in the MS are reset.

In the case of a rejected routeing area update operation, due to regional subscription or roaming restrictions, the new SGSN shall not construct an MM context. A reject shall be returned to the MS with an appropriate cause. The MS shall not re-attempt a routeing area update to that RA. The RAI value shall be deleted when the MS is powered-up.

If the SGSN is unable to update the PDP context in one or more GGSNs, then the SGSN shall deactivate the corresponding PDP contexts as described in subclause "PDP Context Deactivation Initiated by SGSN Procedure". This shall not cause the SGSN to reject the routeing area update.

If the timer described in step 2 expires and no Cancel Location (IMSI) was received from the HLR, then the old SGSN shall stop forwarding N-PDUs to the new SGSN.

If the routeing area update procedure fails a maximum allowable number of times, or if the SGSN returns a Routeing Area Update Reject (Cause) message, the MS shall enter IDLE state.

For an MS with GPRS-CSI defined, CAMEL interaction may be performed, see referenced procedures in 3G TS 23.078:

C1) CAMEL-GPRS-SGSN-Context-Acknowledge.

C2) CAMEL-GPRS-Routeing-Area-Update-Session.

C3) CAMEL-GPRS-Routeing-Area-Update-Context.

NEXT MODIFICATION

6.9.1.3.2 Combined Inter SGSN RA / LA Update

The Combined RA / LA Update (inter SGSN) procedure is illustrated in Figure 2.

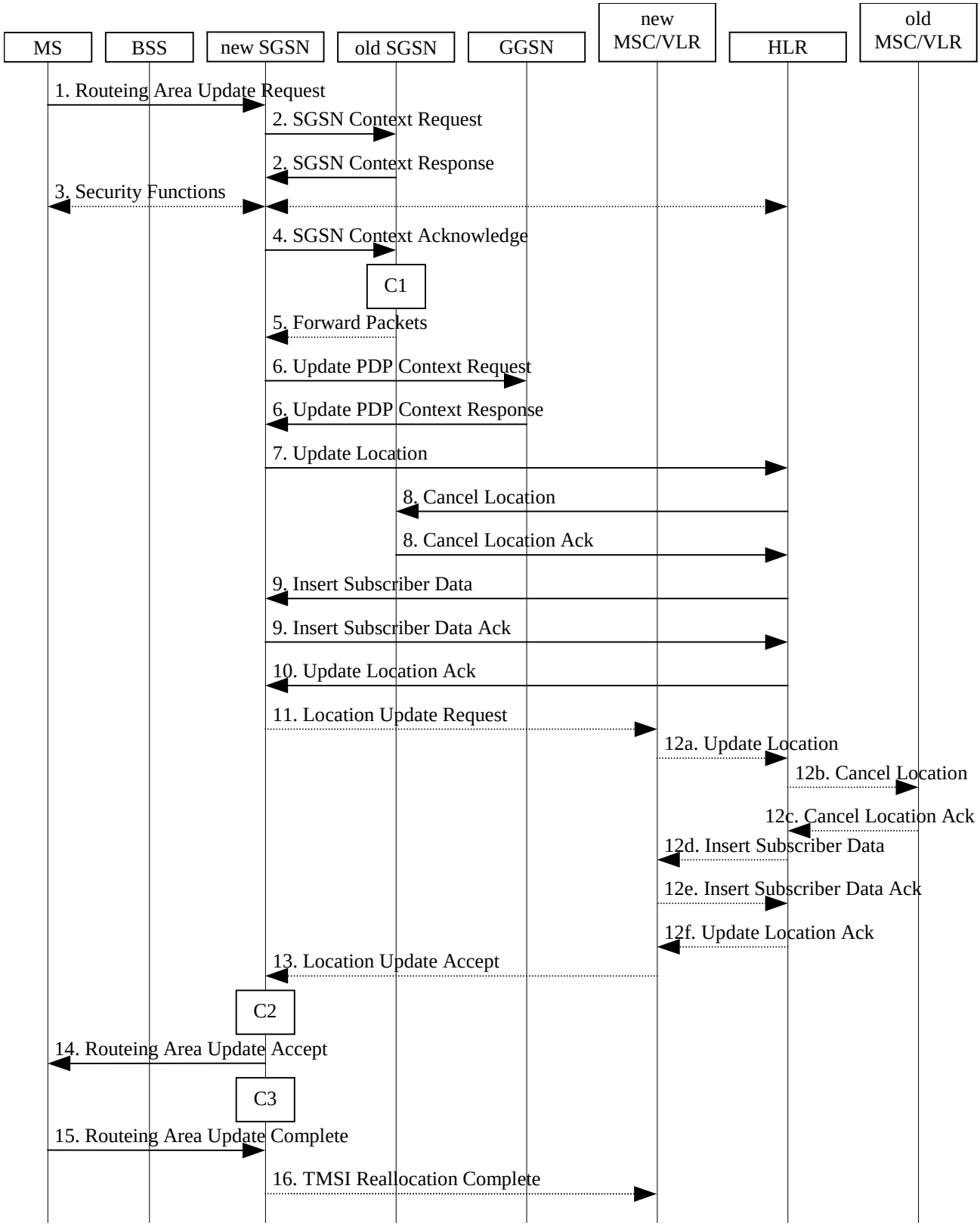

Figure 2: Combined RA / LA Update in the Case of Inter SGSN RA Update Procedure

1) The MS sends a Routeing Area Update Request (old RAI, old P-TMSI Signature, Update Type, MS Network Capability) to the new SGSN. Update Type shall indicate combined RA / LA update, or, if the MS wants to perform an IMSI attach, combined RA / LA update with IMSI attach requested. The BSS shall add the Cell

Global Identity including the RAC and LAC of the cell where the message was received before passing the message to the SGSN.

2) The new SGSN sends SGSN Context Request (old RAI, TLLI, old P-TMSI Signature, New SGSN Address) to the old SGSN to get the MM and PDP contexts for the MS. The old SGSN validates the old P-TMSI Signature and responds with an appropriate error cause if it does not match the value stored in the old SGSN. This should initiate the security functions in the new SGSN. If the security functions authenticate the MS correctly, the new SGSN shall send an SGSN Context Request (old RAI, TLLI, MS Validated, New SGSN Address) message to the old SGSN. MS Validated indicates that the new SGSN has authenticated the MS. If the old P-TMSI Signature was valid or if the new SGSN indicates that it has authenticated the MS, the old SGSN stops assigning SNDCP N-PDU numbers to downlink N-PDUs received, and responds with SGSN Context Response (MM Context, PDP Contexts). If the MS is not known in the old SGSN, the old SGSN responds with an appropriate error cause. The old SGSN stores New SGSN Address until the old MM context is cancelled, to allow the old SGSN to forward data packets to the new SGSN. Each PDP Context includes the SNDCP Send N-PDU Number for the next downlink N-PDU to be sent in acknowledged mode to the MS, the SNDCP Receive N-PDU Number for the next uplink N-PDU to be received in acknowledged mode from the MS, the GTP sequence number for the next downlink N-PDU to be sent to the MS and the GTP sequence number for the next uplink N-PDU to be tunnelled to the GGSN. The old SGSN starts a timer and stops the downlink transfer. The new SGSN shall ignore the MS Network Capability contained in MM Context of SGSN Context Response only when it has previously received an MS Network Capability in the Routeing Area Request.

3) Security functions may be executed. These procedures are defined in subclause "Security Function". Ciphering mode shall be set if ciphering is supported.

4) The new SGSN sends an SGSN Context Acknowledge message to the old SGSN. This informs the old SGSN that the new SGSN is ready to receive data packets belonging to the activated PDP contexts. The old SGSN marks in its context that the MSC/VLR association and the information in the GGSNs and the HLR are invalid. This triggers the MSC/VLR, the GGSNs, and the HLR to be updated if the MS initiates a routeing area update procedure back to the old SGSN before completing the ongoing routeing area update procedure. If the security functions do not authenticate the MS correctly, then the routeing area update shall be rejected, and the new SGSN shall send a reject indication to the old SGSN. The old SGSN shall continue as if the SGSN Context Request was never received.

5) The old SGSN duplicates the buffered N-PDUs and starts tunnelling them to the new SGSN. Additional N-PDUs received from the GGSN before the timer described in step 2 expires are also duplicated and tunnelled to the new SGSN. N-PDUs that were already sent to the MS in acknowledged mode and that are not yet acknowledged by the MS are tunnelled together with the SNDCP N-PDU number. No N-PDUs shall be forwarded to the new SGSN after expiry of the timer described in step 2.

6) The new SGSN sends Update PDP Context Request (new SGSN Address, TEID, QoS Negotiated) to the GGSNs concerned. The GGSNs update their PDP context fields and return an Update PDP Context Response (TEID).

7) The new SGSN informs the HLR of the change of SGSN by sending Update Location (SGSN Number, SGSN Address, IMSI) to the HLR.

8) The HLR sends Cancel Location (IMSI, Cancellation Type) to the old SGSN with Cancellation Type set to Update Procedure. If the timer described in step 2 is not running, then the old SGSN removes the MM and PDP contexts. Otherwise, the contexts are removed only when the timer expires. This allows the old SGSN to complete the forwarding of N-PDUs. It also ensures that the MM and PDP contexts are kept in the old SGSN in case the MS initiates another inter SGSN routeing area update before completing the ongoing routeing area update to the new SGSN. The old SGSN acknowledges with Cancel Location Ack (IMSI).

9) The HLR sends Insert Subscriber Data (IMSI, GPRS Subscription Data) to the new SGSN. The new SGSN validates the MS's presence in the (new) RA. If due to regional subscription restrictions the MS is not allowed to be attached in the RA, the SGSN rejects the Routeing Area Update Request with an appropriate cause, and may return an Insert Subscriber Data Ack (IMSI, SGSN Area Restricted) message to the HLR. If all checks are successful then the SGSN constructs an MM context for the MS and returns an Insert Subscriber Data Ack (IMSI) message to the HLR.

10) The HLR acknowledges the Update Location by sending Update Location Ack (IMSI) to the new SGSN.

11) If the association has to be established, if Update Type indicates combined RA / LA update with IMSI attach requested, or if the LA changed with the routeing area update, then the new SGSN sends a Location Update Request (new LAI, IMSI, SGSN Number, Location Update Type) to the VLR. Location Update Type shall indicate IMSI attach if Update Type in step 1 indicated combined RA / LA update with IMSI attach requested. Otherwise, Location Update Type shall indicate normal location update. The VLR number is translated from the RAI via a table in the SGSN. The SGSN starts the location update procedure towards the new MSC/VLR upon receipt of the first Insert Subscriber Data message from the HLR in step 9). The VLR creates or updates the association with the SGSN by storing SGSN Number.

12) If the subscriber data in the VLR is marked as not confirmed by the HLR, the new VLR informs the HLR. The HLR cancels the old VLR and inserts subscriber data in the new VLR (this signalling is not modified from existing GSM signalling and is included here for illustrative purposes):

    a) The new VLR sends an Update Location (new VLR) to the HLR.

    b) The HLR cancels the data in the old VLR by sending Cancel Location (IMSI) to the old VLR.

    c) The old VLR acknowledges with Cancel Location Ack (IMSI).

    d) The HLR sends Insert Subscriber Data (IMSI, GSM subscriber data) to the new VLR.

    e) The new VLR acknowledges with Insert Subscriber Data Ack (IMSI).

    f) The HLR responds with Update Location Ack (IMSI) to the new VLR.

13) The new VLR allocates a new TMSI and responds with Location Update Accept (VLR TMSI) to the SGSN. VLR TMSI is optional if the VLR has not changed.

14) The new SGSN validates the MS's presence in the new RA. If due to roaming restrictions the MS is not allowed to be attached in the SGSN, or if subscription checking fails, then the SGSN rejects the routeing area update with an appropriate cause. If all checks are successful then the new SGSN establishes MM and PDP contexts for the MS. A logical link is established between the new SGSN and the MS. The new SGSN responds to the MS with Routeing Area Update Accept (P-TMSI, VLR TMSI, P-TMSI Signature, Receive N-PDU Number). Receive N-PDU Number contains the acknowledgements for each acknowledged-mode NSAPI used by the MS, thereby confirming all mobile-originated N-PDUs successfully transferred before the start of the update procedure.

15) The MS confirms the reallocation of the TMSIs by returning a Routeing Area Update Complete (Receive N-PDU Number) message to the SGSN. Receive N-PDU Number contains the acknowledgements for each acknowledged-mode NSAPI used by the MS, thereby confirming all mobile-terminated N-PDUs successfully transferred before the start of the update procedure. If Receive N-PDU Number confirms reception of N-PDUs that were forwarded from the old SGSN, then these N-PDUs shall be discarded by the new SGSN. LLC and SNDCP in the MS are reset.

16) The new SGSN sends TMSI Reallocation Complete message to the new VLR if the VLR TMSI is confirmed by the MS.

In the case of a rejected routeing area update operation, due to regional subscription or roaming restrictions, the new SGSN shall not construct an MM context. A reject shall be returned to the MS with an appropriate cause. The MS shall not re-attempt a routeing area update to that RA. The RAI value shall be deleted when the MS is powered-up.

If the SGSN is unable to update the PDP context in one or more GGSNs, then the SGSN shall deactivate the corresponding PDP contexts as described in subclause "PDP Context Deactivation Initiated by SGSN Procedure". This shall not cause the SGSN to reject the routeing area update.

If the routeing area update procedure fails a maximum allowable number of times, or if the SGSN returns a Routeing Area Update Reject (Cause) message, the MS shall enter IDLE state.

If the timer described in step 2 expires and no Cancel Location (IMSI) was received from the HLR, then the old SGSN shall stop forwarding N-PDUs to the new SGSN.

If the Location Update Accept message indicates a reject, then this should be indicated to the MS, and the MS shall not access non-GPRS services until a successful location update is performed.

For an MS with GPRS-CSI defined, CAMEL interaction may be performed, see referenced procedures in 3G TS 23.078:

C1) CAMEL-GPRS-SGSN-Context-Acknowledge.

C2) CAMEL-GPRS-Routeing-Area-Update-Session.

C3) CAMEL-GPRS-Routeing-Area-Update-Context.

NEXT MODIFICATION

6.9.2.1 Routeing Area Update Procedure

A routeing area update takes place when an attached MS detects that it has entered a new RA or when the periodic RA update timer has expired. The SGSN detects that it is an intra SGSN routeing area update by noticing that it also handles the old RA. In this case, the SGSN has the necessary information about the MS and there is no need to inform the GGSNs or the HLR about the new MS location. A periodic RA update is always an intra SGSN routeing area update. If the network operates in mode I, then an MS that is both GPRS-attached and IMSI-attached shall perform the Combined RA / LA Update procedures.

In UMTS, an RA update is either intra-SGSN or inter-SGSN RA update, either combined RA / LA update or only RA update, either initiated by an MS in PMM-CONNECTED or in PMM-IDLE state. All the RA update cases are contained in the procedure illustrated in Figure 3.

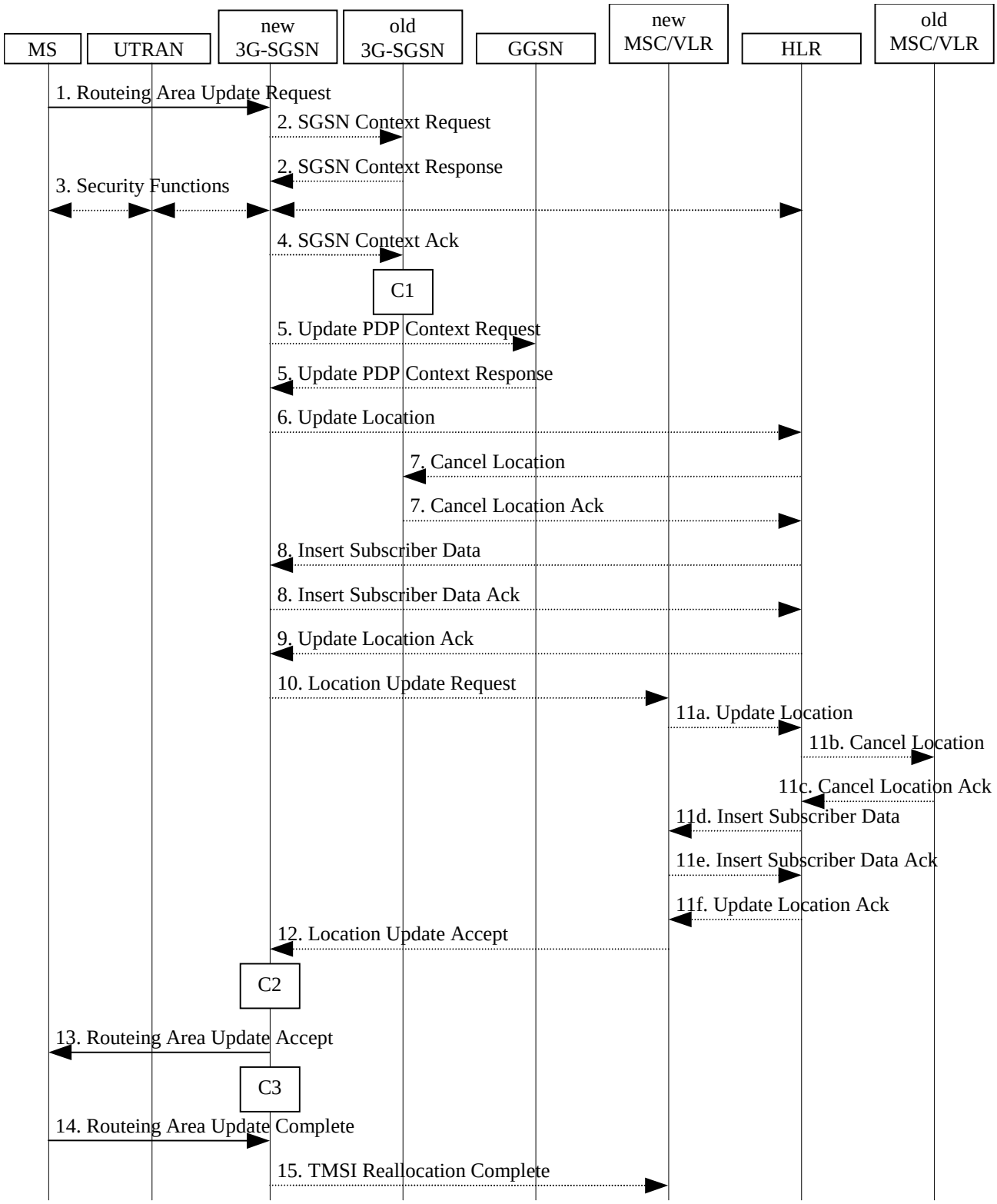

Figure 3: UMTS RA Update Procedure

1) The RRC connection is established, if not already done. The MS sends a Routeing Area Update Request message (P-TMSI, old RAI, old P-TMSI Signature, Update Type, follow on request, MS Network Capability) to the new SGSN. Follow on request shall be set by MS if there is pending uplink traffic (signalling or user data). The SGSN may use, as an implementation option, the follow on request indication to release or keep the Iu connection after the completion of the RA update procedure. Update Type shall indicate:

   - RA Update if the RA Update is triggered by a change of RA;
   - Periodic RA Update if the RA update is triggered by the expiry of the Periodic RA Update timer;
   - Combined RA / LA Update if the MS is also IMSI-attached and the LA update shall be performed in network operation mode I (see subclause "Interactions Between SGSN and MSC/VLR"); or
   - Combined RA / LA Update with IMSI attach requested if the MS wants to perform an IMSI attach in network operation mode I.

   The SRNC shall add the Routeing Area Identity including the RAC and LAC of the area where the MS is located before forwarding the message to the 3G-SGSN. This RA identity corresponds to the RAI in the MM system information sent by the SRNC to the MS.

NOTE: Sending the Routeing Area Update Request message to the SGSN triggers the establishment of a signalling connection between UTRAN and SGSN for the concerned MS.

2) If the RA update is an Inter-SGSN Routeing area update and if the MS was in PMM-IDLE state, the new SGSN sends SGSN Context Request message (old P-TMSI, old RAI, old P-TMSI Signature) to the old SGSN to get the MM and PDP contexts for the MS. The old SGSN validates the old P-TMSI Signature and responds with an appropriate error cause if it does not match the value stored in the old SGSN. This should initiate the security functions in the new SGSN. If the security functions authenticate the MS correctly, the new SGSN shall send an SGSN Context Request (IMSI, old RAI, MS Validated) message to the old SGSN. MS Validated indicates that the new SGSN has authenticated the MS. If the old P-TMSI Signature was valid or if the new SGSN indicates that it has authenticated the MS, the old SGSN responds with SGSN Context Response (Cause, IMSI, MM Context, PDP contexts). If the MS is not known in the old SGSN, the old SGSN responds with an appropriate error cause. The old SGSN starts a timer. The new SGSN shall ignore the MS Network Capability contained in MM Context of SGSN Context Response only when it has previously received an MS Network Capability in the Routeing Area Request.

3) Security functions may be executed. These procedures are defined in subclause "Security Function". If the security functions do not authenticate the MS correctly, then the routeing area update shall be rejected, and the new SGSN shall send a reject indication to the old SGSN. The old SGSN shall continue as if the SGSN Context Request was never received.

4) If the RA update is an Inter-SGSN Routeing area update, the new SGSN sends an SGSN Context Acknowledge message to the old SGSN. The old SGSN marks in its context that the MSC/VLR association and the information in the GGSNs and the HLR are invalid. This triggers the MSC/VLR, the GGSNs, and the HLR to be updated if the MS initiates a routeing area update procedure back to the old SGSN before completing the ongoing routeing area update procedure.

5) If the RA update is an Inter-SGSN RA Update and if the MS was in PMM-IDLE state, the new SGSN sends Update PDP Context Request (new SGSN Address, QoS Negotiated, Tunnel Endpoint Identifier,) to the GGSNs concerned. The GGSNs update their PDP context fields and return an Update PDP Context Response (Tunnel Endpoint Identifier). Note: If the RA update is an Inter-SGSN routeing area update initiated by an MS in PMM-CONNECTED state, then the Update PDP Context Request message is sent as described in subclause "Serving RNS Relocation Procedures".

6) If the RA update is an Inter-SGSN RA Update, the new SGSN informs the HLR of the change of SGSN by sending Update Location (SGSN Number, SGSN Address, IMSI) to the HLR.

7) If the RA update is an Inter-SGSN RA Update, the HLR sends Cancel Location (IMSI, Cancellation Type) to the old SGSN with Cancellation Type set to Update Procedure. If the timer described in step 2 is not running, then the old SGSN removes the MM context. Otherwise, the contexts are removed only when the timer expires. It also ensures that the MM context is kept in the old SGSN in case the MS initiates another inter SGSN routeing area update before completing the ongoing routeing area update to the new SGSN. The old SGSN acknowledges with Cancel Location Ack (IMSI).

8) If the RA update is an Inter-SGSN RA Update, the HLR sends Insert Subscriber Data (IMSI, subscription data) to the new SGSN. The new SGSN validates the MS's presence in the (new) RA. If due to regional subscription restrictions the MS is not allowed to be attached in the RA, the SGSN rejects the Routeing Area Update Request with an appropriate cause, and may return an Insert Subscriber Data Ack (IMSI, SGSN Area Restricted) message to the HLR. If all checks are successful then the SGSN constructs an MM context for the MS and returns an Insert Subscriber Data Ack (IMSI) message to the HLR.

9) If the RA update is an Inter-SGSN RA Update, the HLR acknowledges the Update Location by sending Update Location Ack (IMSI) to the new SGSN.

10) If Update Type indicates combined RA / LA update with IMSI attach requested, or if the LA changed with the routeing area update, then the association has to be established, and the new SGSN sends a Location Update Request (new LAI, IMSI, SGSN Number, Location Update Type) to the VLR. Location Update Type shall indicate IMSI attach if Update Type in step 1 indicated combined RA / LA update with ISI attach requested. Otherwise, Location Update Type shall indicate normal location update. The VLR number is translated from the RAI via a table in the SGSN. The SGSN starts the location update procedure towards the new MSC/VLR upon receipt of the first Insert Subscriber Data message from the HLR in step 8). The VLR creates or updates the association with the SGSN by storing SGSN Number.

11) If the subscriber data in the VLR is marked as not confirmed by the HLR, the new VLR informs the HLR. The HLR cancels the old VLR and inserts subscriber data in the new VLR (this signalling is not modified from existing GSM signalling and is included here for illustrative purposes):

    a) The new VLR sends an Update Location (new VLR) to the HLR.

    b) The HLR cancels the data in the old VLR by sending Cancel Location (IMSI) to the old VLR.

    c) The old VLR acknowledges with Cancel Location Ack (IMSI).

    d) The HLR sends Insert Subscriber Data (IMSI, GSM subscriber data) to the new VLR.

    e) The new VLR acknowledges with Insert Subscriber Data Ack (IMSI).

    f) The HLR responds with Update Location Ack (IMSI) to the new VLR.

12) The new VLR allocates a new TMSI and responds with Location Update Accept (VLR TMSI) to the SGSN. VLR TMSI is optional if the VLR has not changed.

13) The new SGSN validates the MS's presence in the new RA. If due to roaming restrictions the MS is not allowed to be attached in the SGSN, or if subscription checking fails, then the SGSN rejects the routeing area update with an appropriate cause. If all checks are successful then the new SGSN establishes MM context for the MS. The new SGSN responds to the MS with Routeing Area Update Accept (P-TMSI, VLR TMSI, P-TMSI Signature).

14) The MS confirms the reallocation of the TMSIs by returning a Routeing Area Update Complete message to the SGSN.

15) The new SGSN sends a TMSI Reallocation Complete message to the new VLR if the VLR TMSI is confirmed by the MS.

NOTE: Steps 11, 12, and 15, are performed only if step 9 is performed.

In the case of a rejected routeing area update operation, due to regional subscription or roaming restrictions, the new SGSN shall not construct an MM context. A reject shall be returned to the MS with an appropriate cause. The MS shall not re-attempt a routeing area update to that RA. The RAI value shall be deleted when the MS is powered up.

If the routeing area update procedure fails a maximum allowable number of times, or if the SGSN returns a Routeing Area Update Reject (Cause) message, the MS shall enter PMM-DETACHED state.

If the Location Update Accept message indicates a reject, then this should be indicated to the MS, and the MS shall not access non-PS services until a successful location update is performed.

For an MS with GPRS-CSI defined, CAMEL interaction may be performed, see referenced procedures in 3G TS 23.078:

C1) CAMEL-GPRS-SGSN-Context-Acknowledge.

C2) CAMEL-GPRS-Routeing-Area-Update-Session.

C3) CAMEL-GPRS-Routeing-Area-Update-Context.

NEXT MODIFICATION

6.13.2.1 UMTS to GSM Inter SGSN Change

An inter SGSN intersystem change from UMTS to GSM takes place when an MS in PMM-IDLE or PMM-CONNECTED state changes from UTRAN to GSM radio access and the GSM radio access node serving the MS is served by a different SGSN. In this case the RA changes. Therefore, the MS shall initiate a GSM RA update procedure. The RA update procedure is either combined RA / LA update or only RA update, these RA update cases are illustrated in Figure 4.

A combined RA / LA update takes place in network operation mode I when the MS enters a new RA or when a GPRS-attached MS performs IMSI attach. The MS sends a Routeing Area Update Request indicating that an LA update may also need to be performed, in which case the SGSN forwards the LA update to the VLR. This concerns only idle mode (see 3G TS 23.122), as no combined RA / LA updates are performed during a CS connection.

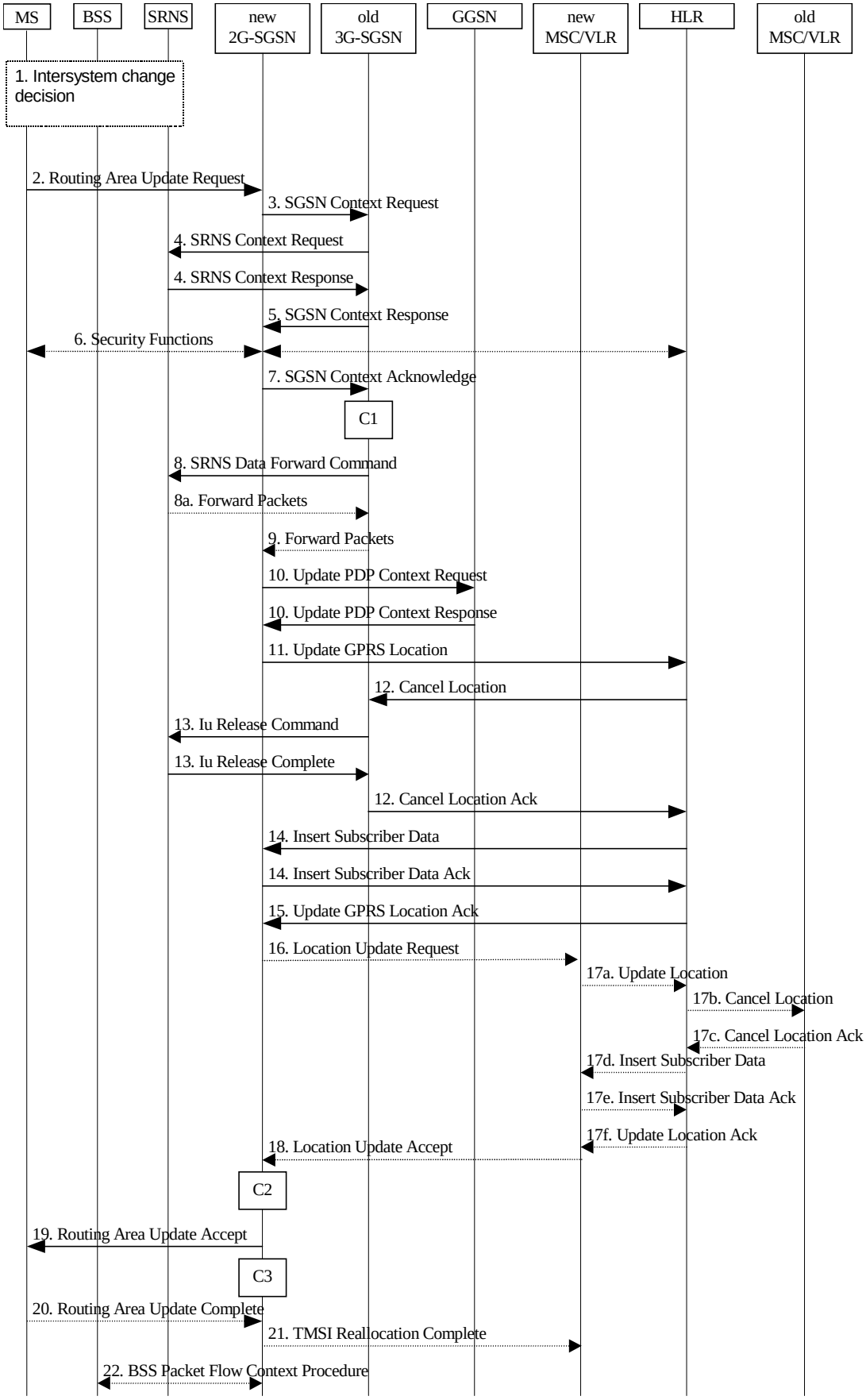

Figure 4: UMTS to GSM Inter SGSN Change

1) The MS or BSS or UTRAN decides to perform an intersystem change, which makes the MS switch to a new cell that supports GSM radio technology, and stops transmission to the network.

2) The MS sends a Routeing Area Update Request (old RAI, old P-TMSI Signature, Update Type, MS Network Capability) message to the new 2G-SGSN. Update Type shall indicate RA update or combined RA / LA update, or, if the MS wants to perform an IMSI attach, combined RA / LA update with IMSI attach requested. The BSS shall add the Cell Global Identity including the RAC and LAC of the cell where the message was received before passing the message to the new 2G-SGSN.

3) The new 2G-SGSN sends an SGSN Context Request (old RAI, TLLI, old P-TMSI Signature, New SGSN Address) message to the old 3G-SGSN to get the MM and PDP contexts for the MS. The old SGSN validates the old P-TMSI Signature and responds with an appropriate error cause if it does not match the value stored in the old 3G-SGSN. The old 3G-SGSN starts a timer. If the MS is not known in the old 3G-SGSN, the old 3G-SGSN responds with an appropriate error cause.

4) If the MS is PMM-CONNECTED the old 3G-SGSN sends an SRNS Context Request (IMSI) message to the SRNS. Upon reception of this message the SRNS buffers and stops sending downlink PDUs to the MS and returns an SRNS Context Response (IMSI, GTP-SNDs, GTP-SNUs, PDCP-SNUs) message. The SRNS shall include for each PDP context the next in-sequence GTP sequence number to be sent to the MS and the GTP sequence number of the next uplink PDU to be tunnelled to the GGSN. For each active PDP context using acknowledged mode, the SRNS also includes the uplink PDCP sequence number (PDCP-SNU). PDCP-SNU shall be the next in-sequence PDCP sequence number expected from the MS (per each active radio bearer). The 3G-SGSN shall strip off the eight most significant bits of the passed PDCP sequence numbers, thus converting them to SNDCP N-PDU numbers.

5) The old 3G-SGSN responds with an SGSN Context Response (MM Context, PDP Contexts) message. For each PDP context the old 3G-SGSN shall include the GTP sequence number for the next uplink GTP PDU to be tunnelled to the GGSN and the next donwlink GTP sequence number for the next in-sequence N-PDU to be sent to the MS. Each PDP Context also includes the SNDCP Send N-PDU Number (the value is 0) for the next in-sequence downlink N-PDU to be sent in acknowledged mode to the MS and the SNDCP Receive N-PDU Number (= converted PDCP-SNU) for the next in-sequence uplink N-PDU to be received in acknowledged mode from the MS. The new 3G-SGSN shall ignore the MS Network Capability contained in MM Context of SGSN Context Response only when it has previously received an MS Network Capability in the Routeing Area Request.

6) Security functions may be executed.

7) The new 2G-SGSN sends an SGSN Context Acknowledge message to the old 3G-SGSN. This informs the old 3G-SGSN that the new 2G-SGSN is ready to receive data packets belonging to the activated PDP contexts. The old SGSN marks in its context that the MSC/VLR association and the information in the GGSNs and the HLR are invalid. This triggers the MSC/VLR, the GGSNs, and the HLR to be updated if the MS initiates a RA update procedure back to the old SGSN before completing the ongoing RA update procedure.

8) If the MS is PMM-CONNECTED the old 3G-SGSN sends an SRNS Data Forward Command (RAB ID, Transport Layer Address, Iu Transport Association) message to the SRNS. The SRNS shall start tunnelling the partly transmitted and the transmitted but not acknowledged PDCP-PDUs together with the PDCP downlink sequence number (the eight most significant bits shall be stripped off), and start duplicating and tunnelling the buffered GTP PDUs to the old 3G-SGSN. Upon reception of SRNS Data Forward Command message from the 3G-SGSN the SRNS shall start the data-forwarding timer.

9) The old 3G-SGSN tunnels the GTP PDUs to the new 2G-SGSN. The sequence numbers (= converted PDCP sequence numbers) shall not be modified in the GTP header of the tunnelled PDUs.

10) The new 2G-SGSN sends an Update PDP Context Request (new SGSN Address, TEID, QoS Negotiated) message to each GGSN concerned. Each GGSN updates its PDP context fields and returns an Update PDP Context Response (TEID) message.

11) The new 2G-SGSN informs the HLR of the change of SGSN by sending an Update GPRS Location (SGSN Number, SGSN Address, IMSI) message to the HLR.

12) The HLR sends a Cancel Location (IMSI) message to the old 3G-SGSN. The old 3G-SGSN acknowledges with a Cancel Location Ack (IMSI) message. The old 3G-SGSN removes the MM and PDP contexts if the timer described in step 3 is not running. If the timer is running then the MM and PDP contexts shall be removed when the timer expires.

13) When the MS is PMM-CONNECTED the old 3G-SGSN sends an Iu Release Command message to the SRNS. When the RNC data-forwarding timer has expired the SRNS responds with an Iu Release Complete message.

14) The HLR sends an Insert Subscriber Data (IMSI, GPRS Subscription Data) message to the new 2G-SGSN. The 2G-SGSN construct an MM context and PDP contexts for the MS and return an Insert Subscriber Data Ack (IMSI) message to the HLR.

15) The HLR acknowledges the Update GPRS Location by returning an Update GPRS Location Ack (IMSI) message to the new 2G-SGSN.

16) If the association has to be established i.e., if Update Type indicates combined RA / LA update with IMSI attach requested, or if the LA changed with the routeing area update, then the new 2G-SGSN sends a Location Update Request (new LAI, IMSI, SGSN Number, Location Update Type) to the VLR. Location Update Type shall indicate IMSI attach if Update Type in step 1 indicated combined RA / LA update with IMSI attach requested. Otherwise, Location Update Type shall indicate normal location update. The VLR number is translated from the RAI by the 2G-SGSN. The 2G-SGSN starts the location update procedure towards the new MSC/VLR upon receipt of the first Insert Subscriber Data message from the HLR in step 14). The VLR creates or updates the association with the 2G-SGSN by storing SGSN Number.

17) If the subscriber data in the VLR is marked as not confirmed by the HLR, the new VLR informs the HLR. The HLR cancels the old VLR and inserts subscriber data in the new VLR (this signalling is not modified from existing GSM signalling and is included here for illustrative purposes):

   a) The new VLR sends an Update Location (new VLR) to the HLR.

   b) The HLR cancels the data in the old VLR by sending Cancel Location (IMSI) to the old VLR.

   c) The old VLR acknowledges with Cancel Location Ack (IMSI).

   d) The HLR sends Insert Subscriber Data (IMSI, GSM subscriber data) to the new VLR.

   e) The new VLR acknowledges with Insert Subscriber Data Ack (IMSI).

   f) The HLR responds with Update Location Ack (IMSI) to the new VLR.

18) The new VLR allocates a new TMSI and responds with Location Update Accept (VLR TMSI) to the 2G-SGSN. VLR TMSI is optional if the VLR has not changed.

19) The new 2G-SGSN validates the MS's presence in the new RA. If due to roaming restrictions the MS is not allowed to be attached in the 2G-SGSN, or if subscription checking fails, then the new 2G-SGSN rejects the routeing area update with an appropriate cause. If all checks are successful then the new 2G-SGSN constructs MM and PDP contexts for the MS. A logical link is established between the new 2G-SGSN and the MS. The establishment procedure is initiated by 2G-SGSN. The new 2G-SGSN responds to the MS with a Routeing Area Update Accept (P-TMSI, P-TMSI Signature, Receive N-PDU Number (= converted PDCP-SNU)) message. Receive N-PDU Number contains the acknowledgements for each acknowledged-mode NSAPI used by the MS, thereby confirming all mobile-originated N-PDUs successfully transferred before the start of the update procedure.

20) The MS acknowledges the new P-TMSI by returning a Routeing Area Update Complete (Receive N-PDU Number (= converted PDCP-SND)) message to the SGSN. Receive N-PDU Number contains the acknowledgements for each acknowledged-mode NSAPI used by the MS, thereby confirming all mobile-terminated N-PDUs successfully transferred before the start of the update procedure. The MS deducts Receive N-PDU number from PDCP-SND by stripping off the eight most significant bits. PDCP-SND is the PDCP sequence number for the next expected in-sequence downlink packet to be received in acknowledged mode in the MS per radio bearer, which requires lossless handover.

21) The new 2G-SGSN sends TMSI Reallocation Complete message to the new VLR if the VLR TMSI is confirmed by the MS.

22) The 2G-SGSN and the BSS may execute the BSS Packet Flow Context procedure.

For an MS with GPRS-CSI defined, CAMEL interaction may be performed, see referenced procedures in 3G TS 23.078:

C1) CAMEL-GPRS-SGSN-Context-Acknowledge.

C2) CAMEL-GPRS-Routeing-Area-Update-Session.

C3) CAMEL-GPRS-Routeing-Area-Update-Context.

NEXT MODIFICATION

6.13.2.2 GPRS to UMTS Inter SGSN Change

The intersystem change from GSM to UMTS takes place when a GPRS-attached MS changes from GSM radio access to UTRAN and the UTRAN node serving the MS is served by a different SGSN. In this case the RA changes. Therefore, the MS shall initiate a UMTS RA update procedure by establishing a RRC connection and initiating the RA update procedure. The RA update procedure is either combined RA / LA update or only RA update, these RA update cases are illustrated in Figure 5.

If the network operates in mode I, then an MS that is both PS-attached and CS-attached shall perform the Combined RA / LA Update procedures. This concerns only idle mode (see 3G TS 23.122), as no combined RA / LA updates are performed during a CS connection.

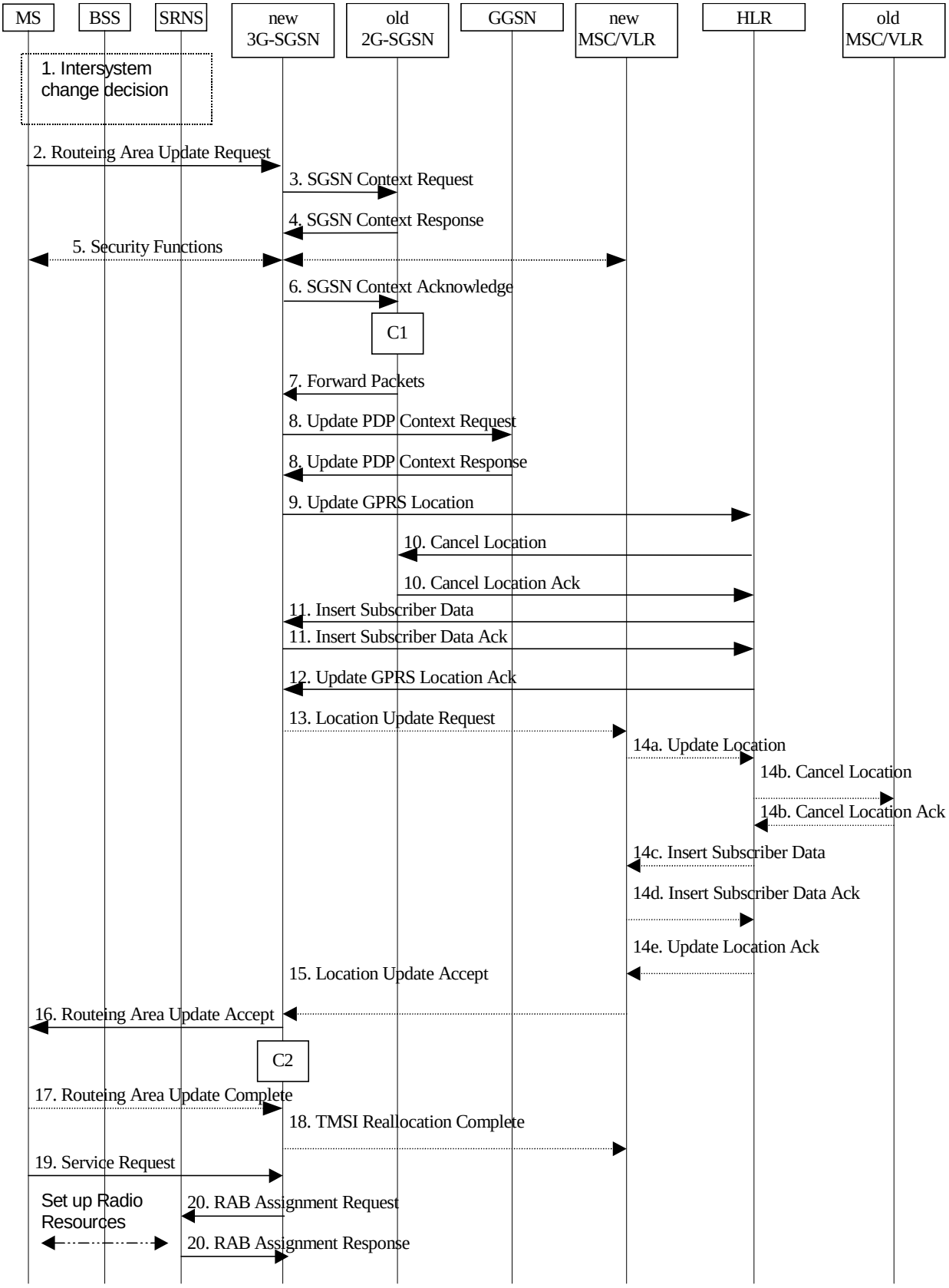

Figure 5: GSM to UMTS Inter SGSN Change

1) The MS or BSS or UTRAN decides to perform an intersystem change, which makes the MS switch to a new cell that supports UMTS radio technology, and stops transmission to the network.

2) The MS sends a Routeing Area Update Request (P-TMSI, old RAI, old P-TMSI Signature, Update Type, CM, MS Network Capability) message to the new 3G-SGSN. Update Type shall indicate RA update or combined RA / LA update, or, if the MS wants to perform an IMSI attach, combined RA / LA update with IMSI attach requested. The SRNC shall add the Routeing Area Identity including the RAC and LAC of the area where the

MS is located before forwarding the message to the 3G-SGSN. This RA identity corresponds to the RAI in the MM system information sent by the SRNC to the MS.

3) The new 3G-SGSN uses the old RAI received from the MS to derive the old 2G-SGSN address, and sends an SGSN Context Request (old RAI, old P-TMSI, New SGSN Address) message to the 2G-SGSN to get the MM and PDP contexts for the MS. The old 2G-SGSN starts a timer and stops the transmission of N-PDUs to the MS.

4) The old 2G-SGSN responds with an SGSN Context Response (MM Context, PDP Contexts) message. Each PDP Context includes the GTP sequence number for the next downlink N-PDU to be sent to the MS and the GTP sequence number for the next uplink N-PDU to be tunnelled to the GGSN. Each PDP Context also includes the SNDCP Send N-PDU Number for the next downlink N-PDU to be sent in acknowledged mode to the MS and the SNDCP Receive N-PDU Number for the next uplink N-PDU to be received in acknowledged mode from the MS. The new 3G-SGSN shall use the GTP sequence numbers for in-sequence delivery over the Iu interface. The new 3G-SGSN shall ignore the MS Network Capability contained in MM Context of SGSN Context Response only when it has previously received an MS Network Capability in the Routeing Area Request.

5) Security functions may be executed.

6) The new 3G-SGSN sends an SGSN Context Acknowledge message to the old 2G-SGSN. This informs the old 2G-SGSN that the new 3G-SGSN is ready to receive data packets belonging to the activated PDP contexts. The old SGSN marks in its context that the MSC/VLR association and the information in the GGSNs and the HLR are invalid. This triggers the MSC/VLR, the GGSNs, and the HLR to be updated if the MS initiates a routeing area update procedure back to the old SGSN before completing the ongoing routeing area update procedure.

7) The old 2G-SGSN duplicates the buffered N-PDUs and starts tunnelling them to the new 3G-SGSN. Additional N-PDUs received from the GGSN before the timer described in step 3 expires are also duplicated and tunnelled to the new 3G-SGSN. No N-PDUs shall be forwarded to the new 3G-SGSN after expiry of the timer described in step 3.

8) The new 3G-SGSN sends an Update PDP Context Request (new SGSN Address, TEID, QoS Negotiated) message to each GGSN concerned. Each GGSN updates its PDP context fields and return an Update PDP Context Response (TEID) message.

9) The new 3G-SGSN informs the HLR of the change of SGSN by sending an Update GPRS Location (SGSN Number, SGSN Address, IMSI) message to the HLR.

10) The HLR sends a Cancel Location (IMSI, Cancellation Type) message to the old 2G-SGSN. The old 2G-SGSN removes the MM and PDP contexts if the timer described in step 3 is not running. If the timer is running the MM and PDP contexts are removed when the timer expires. The old 2G-SGSN acknowledges with a Cancel Location Ack (IMSI) message.

11) The HLR sends an Insert Subscriber Data (IMSI, GPRS Subscription Data) message to the new 3G-SGSN. The 3G-SGSN constructs an MM context for the MS and returns an Insert Subscriber Data Ack (IMSI) message to the HLR.

12) The HLR acknowledges the Update GPRS Location by returning an Update GPRS Location Ack (IMSI) message to the new 3G-SGSN.

13) If the association has to be established, if Update Type indicates combined RA / LA update with IMSI attach requested, or if the LA changed with the routeing area update, then the new SGSN sends a Location Update Request (new LAI, IMSI, SGSN Number, Location Update Type) to the VLR. Location Update Type shall indicate IMSI attach if Update Type in step 1 indicated combined RA / LA update with IMSI attach requested. Otherwise, Location Update Type shall indicate normal location update. The VLR number is translated from the RAI by the 3G-SGSN. The 3G-SGSN starts the location update procedure towards the new MSC/VLR upon receipt of the first Insert Subscriber Data message from the HLR in step 12). The VLR creates or updates the association with the 3G-SGSN by storing SGSN Number.

14) If the subscriber data in the VLR is marked as not confirmed by the HLR, the new VLR informs the HLR. The HLR cancels the old VLR and inserts subscriber data in the new VLR (this signalling is not modified from existing GSM signalling and is included here for illustrative purposes):

    a) The new VLR sends an Update Location (new VLR) to the HLR.

    b) The HLR cancels the data in the old VLR by sending Cancel Location (IMSI) to the old VLR.

    c) The old VLR acknowledges with Cancel Location Ack (IMSI).

d) The HLR sends Insert Subscriber Data (IMSI, GSM subscriber data) to the new VLR.

e) The new VLR acknowledges with Insert Subscriber Data Ack (IMSI).

f) The HLR responds with Update Location Ack (IMSI) to the new VLR.

15) The new VLR allocates a new TMSI and responds with Location Update Accept (VLR TMSI) to the 3G-SGSN. VLR TMSI is optional if the VLR has not changed.

16) The new 3G-SGSN validate the MS's presence in the new RA. If due to roaming restrictions the MS is not allowed to be attached in the 3G-SGSN, or if subscription checking fails, then the new 3G-SGSN rejects the routeing area update with an appropriate cause. If all checks are successful then the new 3G-SGSN constructs MM and PDP contexts for the MS. The new 3G-SGSN responds to the MS with a Routeing Area Update Accept (P-TMSI, P-TMSI signature) message.

17) The MS acknowledges the new P-TMSI by returning a Routeing Area Update Complete message to the SGSN.

18) The new 3G-SGSN sends TMSI Reallocation Complete message to the new VLR if the VLR TMSI is confirmed by the MS.

19) If the MS was in GPRS MM state READY it sends a Service Request (P-TMSI, RAI, CKSN, Service Type) message to the SGSN. Service Type specifies the requested service. Service Type shall indicate one of the following: Data or Signalling.

20) If the MS has send the Service Request the new 3G-SGSN requests the SRNS to establish a radio access bearer by sending a RAB Assignment Request (RAB ID(s), QoS Profile(s), GTP-SNDs, GTP-SNUs, PDCP-SNUs) message to the SRNS. The PDCP sequence numbers shall be derived from the N-PDU sequence numbers stored in the PDP contexts. The SRNS sends a Radio Bearer Setup Request (PDCP-SNUs) message to the MS. The MS responds with a Radio Bearer Setup Complete (PDCP-SNDs) message. The SRNS responds with a RAB Assignment Response message. The SRNS shall discard all N-PDUs tunnelled from the SGSN with N-PDU sequence numbers older than the PDCP-SNDs received from the MS. Other N-PDUs shall be transmitted to the MS. The MS shall discard all N-PDUs with sequence numbers older than the PDCP-SNUs received from the SRNS. Other N-PDUs shall be transmitted to the SRNS.

NOTE: The NSAPI value is carried in the RAB ID IE.

For an MS with GPRS-CSI defined, CAMEL interaction may be performed, see referenced procedures in 3G TS 23.078:

C1) CAMEL-GPRS-SGSN-Context-Acknowledge.

C2) CAMEL-GPRS-Routeing-Area-Update-Session.

C3) CAMEL-GPRS-Routeing-Area-Update-Context.

3GPP TSG-CN-WG1, Meeting #13
14-18 August, 2000
Vancouver/Canada

Tdoc N1-001044

Title: **UE-Triggered Re-Authentication**

Source: **TSG CN WG1**

TO: **TSG SA WG3**

Cc: **TSG T WG3, TSG RAN WG2**

(Proposed) WI: **UE-Triggered Re-Authentication**

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Date: **18-08-2000**

N1 thank S3 for their LS (S3-000487 = N1-000926) on the above subject. N1 discussed this matter and came to the conclusion that a seperate work item, within N1, for the stage three specification of UE-Triggered Re-Authentication is not needed.

N1 has therefore reviewed the WI description drafted by S3 and concluded the following:

N1 feels that S3 be the leaders of this WI, and that the WI be at 'Building Block' level.

It is difficult at this time for N1 to fully analyse the affected specifications and projected timescales until a detailed stage two has been made available by S3.

N1 were able to identify that changes to the authentication procedure in 24.008 will be necessary and therefore that the ME will definitely fall within the scope of this work.

3GPP TSG-CN-WG1, Meeting #13
14-18 August, 2000
Vancouver/Canada

Tdoc N1-00104537

Title: **Liaison Statement on Directed Retry in UMTS and Inter-System**

Source: **TSG-CN WG1**

TO: **TSG-RAN WG3**

Cc: **TSG-SA WG2**

WI: **GSM / UMTS interworking**

Contact Person:

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Attachments: **N1-000990 (This CR was discussed but not agreed by TSGN WG1)**

Date: **18 August 2000**

CN1 has discussed the issue of Directed Retry in UMTS and Inter-system to complete the outstanding work on directed retry procedures in the case of an SRNS relocation and Inter-System handovers, which is indicated as for further study in 23.009 v3.3.0.

Some CN1 delegates indicated that further work would be required within the RAN specifications to include the directed retry procedures in RANAP. Several companies in CN1 would like to see the DR procedure to be applicable to UTRAN also.

CN1 seeks RAN3 opinion on the possibility to include directed retry procedures in the RANAP specifications and inform CN1 if this can be achieved, and in which release so, CN1 can finalize the Stage 2 specification.

3GPP TSG-CN-WG1, Meeting #13
14-18 August, 2000
Vancouver/Canada

Tdoc N1-000832

3GPP TSG SA2
Berlin, Germany,
May 22nd – 26th, 2000

S2-000951

LIAISION STATEMENT

To: RAN WG3, CN WG1

CC:

Source: SA WG2

Title: Response to LS on timing between RAB Assignment Response and user data

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TSG SA WG2 would like to thank RAN WG3 for their Liaision Statement (S2-000851).

As regards to the normal case of the RAN establishment, SA2 is sharing the view of RAN WG3.

In the case of the RAB re-establishment, SA2 view is that SGSN is able to receive uplink user data before the RAB Assignment Response message has been received.