3GPP TSG_CN#7 **NP-000092**
ETSI SMG3 Plenary Meeting #7,
Madrid, Spain
13th – 15th March 2000

Agenda item: **5.1.3**

Source: **TSG_N WG1**

Title: **CRs to 3G Work Item GSM/UMTS Interworking-Part 1**

Introduction:

This document contains **"13"** CRs on **Work Item GSM/UMTS Interworking,** that have been agreed by **TSG_N WG1,** and are forwarded to **TSG_N Plenary** meeting #7 for approval.

Tdoc	Spec	CR	Rev	CAT	Rel.	Old Ver	New Ver	Subject
N1-000169	24.008	CR107	1	B	R99	3.2.1	3.3.0	Abnormal cases in Service Request procedure
N1-000501	24.008	CR135	1	C	R99	3.2.1	3.3.0	BCIE changes to support high speed data in UMTS/UTRAN
N1-000375	24.008	CR127		F	R99	3.2.1	3.3.0	Clarification to the MS handling when receiving detach type 'IMSI detach'.
N1-000437	23.009	CR007		A	R99	3.1.0	3.2.0	Clarifications of 3G_MSC-A and 3G_MSC-B roles
N1-000354	24.008	CR160		D	R99	3.2.1	3.3.0	Correction of length of TI
N1-000524	24.008	CR179		F	R99	3.2.1	3.3.0	Correction of Service request procedure after the colition with Detach procedure
N1-000339	24.008	CR147		C	R99	3.2.1	3.3.0	Corrections to Service Request procedure
N1-000551	24.008	CR168	2	C	R99	3.2.1	3.3.0	DRX parameter for UMTS
N1-000507	24.008	CR158	1	C	R99	3.2.1	3.3.0	Duplicated PDP context activation
N1-000395	23.009	CR003		B	R99	3.1.0	3.2.0	Functional requirements for the use of RANAP over the E i/f
N1-000503	24.008	CR142	1	F	R99	3.2.1	3.3.0	Initial value for T3302
N1-000504	24.008	CR145	1	C	R99	3.2.1	3.3.0	Intersystem change GSM <-> UMTS
N1-000436	23.009	CR006		C	R99	3.1.0	3.2.0	Introduction of RANAP for intra-UMTS inter-MSC relocation

3GPP TSG-CN WG1 Meeting #10
Abiko, Japan, 11-14 Jan 2000

Document N1-00169
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**	**107r1**	Current Version:	3.2.1

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

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

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

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

Source: CN1 **Date:** 00-01-11

Subject: Abnormal cases in Service Request procedure

Work item: GSM/UMTS interworking

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

Reason for change:

It may occur that the MS and SGSN have different set of activated PDP context(s). The service request procedure under this type of unsynchronized condition leeds to abnormal case. In this CR, an unsynchronized condition where MS has active PDP context(s) while SGSN has de-activated all PDP context(s) is considered

In UMTS, if the MS in PMM-IDLE mode has an upward user packets which need to be send, the MS first sends a SERVICE REQUEST message indicating "data" to the network. It is proposed that in the unsynchronised condition where the SGSN does not have any active PDP context(s) and therefore no RABs may be established, the SGSN rejects the service request by sending a SERVICE REJECT message with a cause value indicating "no PDP context activated" to the MS. Receiving the reject message, the MS shall deactivate all the PDP context locally, after which the MS may perform PDP context activation to re-establish the deactivated PDP context(s).

Clauses affected: 4.7.13

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.

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. 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 indicating either data, signaling or paging response.

4.7.13.2 GMM common procedure initiation

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

4.7.13.3 Service request procedure accepted by the network

An indication from the lower layers that the security mode setting 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.

- If the MS is IMSI attached via MM procedures, the MS 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.

- If the MS is IMSI attached via MM procedures, the MS 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 ciphering mode setting procedure is completed, SERVICE ACCEPT or SERVICE REJECT message is received

The procedure shall be aborted.

c) T3317 expired

The procedure shall be aborted.

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 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 ifself 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. Follow-on request pending may be indicated in the ATTACH REQUEST for the service, which was the trigger of the aborted Service request procedure, to restart after the completion of the GPRS attach request procedure.

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 procedure is completed, a SERVICE ACCEPT or SERVICE REJECT message has been sent to the MS, the network 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 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 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 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 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 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.

10.5.5.14 GMM cause

The purpose of the GMM cause information element is to indicate the reason why a GMM request from the mobile station is rejected by the network.

The GMM cause information element is coded as shown in figure 10.5.129/TS 24.008 and table 10.5.147/TS 24.008.

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

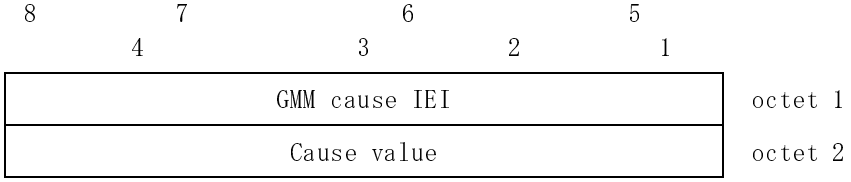

Figure 10.5.129/TS 24.008: GMM cause information element

Table 10.5.147/TS 24.008: GMM cause information element

```
   Cause value (octet 2)                                  ¬
         Bits
     8 7 6 5 4 3 2 1
     0 0 0 0 0 0 1 0  IMSI unknown in HLR
0 0 0 0 0 0 1 1  Illegal MS
     0 0 0 0 0 1 1 0  Illegal ME

     0 0 0 0 0 1 1 1  GPRS services  not allowed
     0 0 0 0 1 0 0 0  GPRS services and non-GPRS services
                          not allowed

     0 0 0 0 1 0 0 1  MS identity cannot be derived by the
                      network
     0 0 0 0 1 0 1 0  Implicitly detached

     0 0 0 0 1 0 1 1  PLMN not allowed
     0 0 0 0 1 1 0 0  Location Area not allowed
     0 0 0 0 1 1 0 1  Roaming not allowed in this
                        location area

   0 0 0 0 1 1 1 1  PS MAC failure
     0 0 0 1 1 1 1 1  PS Synch failure
     0 0 0 1 0 0 0 0  MSC temporarily not reachable
     0 0 0 1 0 0 0 1  Network failure
     0 0 0 1 0 1 1 0  Congestion
     0 0 1 0 1 0 0 0  No PDP context activated
     0 0 1 1 0 0 0 0  }
           to         }  retry upon entry into a new cell
     0 0 1 1 1 1 1 1  }

     0 1 0 1 1 1 1 1  Semantically incorrect message
     0 1 1 0 0 0 0 0  Invalid mandatory information
     0 1 1 0 0 0 0 1  Message type non-existent
                        or not implemented
     0 1 1 0 0 0 1 0  Message type not compatible with
                      the protocol state
     0 1 1 0 0 0 1 1  Information element non-existent
                        or not implemented
     0 1 1 0 0 1 0 0  Conditional IE error
     0 1 1 0 0 1 0 1  Message not compatible with
                        the protocol state
     0 1 1 0 1 1 1 1  Protocol error, unspecified

     Any other value received by the mobile station
     shall be treated as 0110 1111, 'Protocol error,'
     unspecified'. Any other value received
     by the network shall be treated as 0110 1111,
     'Protocol error, unspecified'.

     NOTE: The  listed reject cause values are defined in
           Annex G.
```

G.6 Additional cause codes for GMM

Cause value = 7 GPRS services not allowed

This cause is sent to the MS if it requests an IMSI attach for GPRS services, but is not allowed to operate GPRS services.

Cause value = 8 GPRS services and non-GPRS services not allowed

This cause is sent to the MS if it requests a combined IMSI attach for GPRS and non-GPRS services, but is not allowed to operate either of them.

Cause value = 9 MS identity cannot be derived by the network

This cause is sent to the MS when the network cannot derive the MS's identity from the P-TMSI in case of inter-SGSN routing area update.

Cause value = 10 Implicitly detached

This cause is sent to the MS either if the network has implicitly detached the MS, e.g. some while after the Mobile reachable timer has expired, or if the GMM context data related to the subscription dose not exist in the SGSN e.g. because of a SGSN restart.

Cause value = 16 MSC temporarily not reachable

This cause is sent to the MS if it requests a combined GPRS attach or routing are updating in a PLMN where the MSC is temporarily not reachable via the GPRS part of the GSM network.

Cause value = 7 PS MAC failure

This cause is sent to the SGSN if the SIM detects that the MAC in the authentication request message is not fresh (see TS 33.102)

Cause value = 15 PS Synch failure

This cause is sent to the SGSN if the SIM detects that the SQN in the authentication request message is out of range (see TS 33.102)

Cause value = 40 No PDP context activated

This cause is sent to the MS if the MS requests an establishment of the radio access bearers for all active PDP contexts by sending a SERVICE REQUEST message indicating "data" to the network, but the SGSN does not have any active PDP context(s).

3GPP/SMG Meeting #11
Umeå, Sweden, 28 Feb – 03 Mar 2000

Document N1-000339

CHANGE REQUEST

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24.008	**CR**	**147**	Current Version:	3.2.1

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

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

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

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

Source: CN1 **Date:** 2000-02-20

Subject: Corrections to Service Request procedure

Work item: GSM-UMTS interworking

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

Reason for change:

This CR:
-corrects that the IMSI is not sent by the MS to the network in the Service Request message;
-corrects that security mode setting procedure is not a GMM common procedure;
-for reject causes #3, #6, #11, #12 and #13, an MS in operation mode A shall in addition delete the SIM data related to CS services;
-corrects the reference to the section where the coding of Service Type is defined (10.5.5.20).
-corrects the reference to the section where the coding of P-TMSI is defined (10.5.1.4);
-corrects the length of information element 'P-TMSI' to 6 octets;

Clauses affected: 4.7.13.1, 4.7.13.2, 4.7.13.3, 4.7.13.4, 4.7.13.5, 9.4.20

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:

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. 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~~ing~~ 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 ~~and~~ or the GMM authentication and ciphering procedure~~, or security mode setting procedure~~, depending on the received information such as ~~IMSI,~~ GPRS ciphering key sequence number, P-TMSI and P-TMSI signature.

4.7.13.3 Service request procedure accepted by the network

An indication from the lower layers that the security mode setting 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.

- ~~If the MS is IMSI attached via MM procedures, the MS~~ 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.

- ~~If the MS is IMSI attached via MM procedures, the MS~~ 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.

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 ~~ciphering~~ security mode setting procedure is completed, SERVICE ACCEPT or SERVICE REJECT message is received

The procedure shall be aborted.

c) T3317 expired

The procedure shall be aborted.

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 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 ifself 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. Follow-on request pending may be indicated in the ATTACH REQUEST for the service, which was the trigger of the aborted Service request procedure, to restart the Service request procedure after the completion of the GPRS attach request procedure.

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 procedure is completed, a SERVICE ACCEPT or SERVICE REJECT message has been sent to the MS, the network 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 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 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 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 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 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.

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

9.4.20 Service Request (UMTS only)

This message is sent by the MS to transfer to establish logical association between the MS and the network. See table 9.4.20/TS 24.008.

Message type: Service Request

Significance: dual

Direction: MS to network

Table 9.4.20/TS 24.008: Contents of Service 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
	Service Request	Message type 10.4	M	V	1
	Ciphering key sequence number	Ciphering key sequence number 10.5.1.2	M	V	1/2
	Service type	Service type 10.5.5.~~*~~20	M	V	1/2
	P-TMSI	Mobile station identity ~~10.5.7.4~~ 10.5.1.4	M	LV	~~5~~6
19	P-TMSI signature	P-TMSI signature 10.5.5.8	O	TV	4

9.4.20.1 P-TMSI signature

This IE is included if a valid P-TMSI signature is available.

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

***Document* N1-000354**
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**	**160**	Current Version:	3.2.1

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

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

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

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

Source: CN1 **Date:** 21 February, 2000

Subject: Correction of length of TI

Work item: GSM/UMTS Interwork

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

Reason for change: For SM protocol, usage of extended TI is allowed, however message content table has not yet been updated.

Clauses affected: 10.5.1.6

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.

9.5.1 Activate PDP context request

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

Message type: ACTIVATE PDP CONTEXT REQUEST

Significance: global

Direction: MS to network

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

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

9.5.1.1 Access point name

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

9.5.1.2 Protocol configuration options

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

9.5.2 Activate PDP context accept

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

Message type: ACTIVATE PDP CONTEXT ACCEPT

Significance: global

Direction: network to MS

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

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

9.5.2.1 PDP address

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

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

9.5.2.2 Protocol configuration options

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

9.5.2.3 Packet Flow Identifier

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

9.5.3 Activate PDP context reject

This message is sent by the network to the MS to reject activation of a PDP context.
See table 9.5.3/TS 24.008.

Message type: ACTIVATE PDP CONTEXT REJECT

Significance: global

Direction: network to MS

Table 9.5.3/TS 24.008: ACTIVATE PDP CONTEXT REJECT message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2 – 3/2
	Activate PDP context reject message identity	Message type 10.4	M	V	1
	SM cause	SM Cause 10.5.6.6	M	V	1
27	Protocol configuration options	Protocol configuration options 10.5.6.3	O	TLV	3 - 253

9.5.3.1 Protocol configuration options

The protocol configuration options IE may only be inserted by the network (see TS29.060) if the SM Cause indicates "activation rejected by GGSN".

9.5.4 Activate Secondary PDP Context Request

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

Message type: ACTIVATE SECONDARY PDP CONTEXT REQUEST

Significance: global

Direction: MS to network

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

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

9.5.5 Activate Secondary PDP Context Accept

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

Message type: ACTIVATE SECONDARY PDP CONTEXT ACCEPT

Significance: global

Direction: network to MS

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

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

9.5.5.1 Packet Flow Identifier

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

9.5.6 Activate Secondary PDP Context Reject

This message is sent by the network to the UE to reject activation of a secondary PDP context. See Table 9.5.6/TS 24.008.

Message type: ACTIVATE SECONDARY PDP CONTEXT REJECT

Significance: global

Direction: network to MS

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

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2 – 3/2
	Activate secondary PDP context reject message identity	Message type 10.4	M	V	1
	SM cause	SM Cause 10.5.6.6	M	V	1

9.5.7 Request PDP context activation

This message is sent by the network to the MS to initiate activation of a PDP context.
See table 9.5.7/TS 24.008.

Message type: REQUEST PDP CONTEXT ACTIVATION

Significance: global

Direction: network to MS

Table 9.5.7/TS 24.008: REQUEST PDP CONTEXT ACTIVATION message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2 – 3/2
	Request PDP context activation message identity	Message type 10.4	M	V	1
	Offered PDP address	Packet data protocol address 10.5.6.4	M	LV	3 - 19
28	Access point name	Access point name 10.5.6.1	O	TLV	3 – 102

9.5.8 Request PDP context activation reject

This message is sent by the MS to the network to reject initiation of a PDP context activation.
See table 9.5.8/TS 24.008.

Message type: REQUEST PDP CONTEXT ACTIVATION REJECT

Significance: global

Direction: MS to network

Table 9.5.8/TS 24.008: REQUEST PDP CONTEXT ACTIVATION REJECT message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2 – 3/2
	Request PDP context act. reject message identity	Message type 10.4	M	V	1
	SM cause	SM cause 10.5.6.6	M	V	1
28	Access point name	Access point name 10.5.6.1	O	TLV	3 – 102

9.5.9 Modify PDP context request (Network to MS direction)

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

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

Significance: global

Direction: network to MS

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

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

9.5.9.1 PDP address

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

9.5.9.2 Packet Flow Identifier

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

9.5.10 Modify PDP context request (MS to network direction)

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

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

Significance: global

Direction: MS to network

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

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2 – 3/2
	Modify PDP context request message identity	Message type 10.4	M	V	1
32	Requested LLC SAPI	LLC service access point identifier 10.5.6.9	O	TV	2
30	Requested new QoS	Quality of service 10.5.6.5	O	TLV	FFS
31	New TFT	Traffic Flow Template	O	TLV	FFS

9.5.10.1 Requested LLC SAPI

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

9.5.10.2 Requested new QoS

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

9.5.10.3 New TFT

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

9.5.11 Modify PDP context accept (MS to network direction)

This message is sent by the MS to the network to acknowledge the modification of an active PDP context. See table 9.5.11/TS 24.008.

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

Significance: global

Direction: MS to network

Table 9.5.11/TS 24.008: MODIFY PDP CONTEXT ACCEPT (MS TO NETWORK DIRECTION) message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2 – 3/2
	Modify PDP context accept message identity	Message type 10.4	M	V	1

9.5.12 Modify PDP context accept (Network to MS direction)

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

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

Significance: global

Direction: Network to MS

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

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

9.5.12.1 Negotiated QoS

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

9.5.12.2 Negotiated LLC SAPI

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

9.5.12.3 New radio priority

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

9.5.12.4 Packet Flow Identifier

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

9.5.13 Modify PDP Context Reject

This message is sent by the network to the UE to reject the requested modification of the TFT. The network should not send a MODIFY PDP CONTEXT REJECT message if the requested QoS is not available. See Table 9.5.13/TS 24.008.

Message type: MODIFY PDP CONTEXT REJECT

Significance: global

Direction: network to MS

Table 9.5.13/TS 24.008: MODIFY PDP CONTEXT REJECT message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2 – 3/2
	Modify PDP Context Reject	Message type 10.4	M	V	1
	SM cause	SM Cause 10.5.6.6	M	V	1

9.5.14 Deactivate PDP context request

This message is sent to request deactivation of an active PDP context. See table 9.5.8/TS 24.008.

Message type: DEACTIVATE PDP CONTEXT REQUEST

Significance: global

Direction: both

Table 9.5.14/TS 24.008: DEACTIVATE PDP CONTEXT REQUEST message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2 – 3/2
	Deactivate PDP context request message identity	Message type 10.4	M	V	1
	SM cause	SM cause 10.5.6.6	M	V	1
35	Tear down indicator	Tear down indicator 10.5.6.10	O	TV	1

9.5.14.1 Tear down indicator

This IE is included in the message in order to indicate whether only the PDP context associated with this

specific TI or all active PDP contexts sharing the same PDP address as the PDP context associated with this specific TI shall be deactivated..

9.5.15 Deactivate PDP context accept

This message is sent to acknowledge deactivation of the PDP context requested in the corresponding *Deactivate PDP context request* message. See table 9.5.15/TS 24.008.

Message type: DEACTIVATE PDP CONTEXT ACCEPT

Significance: global

Direction: both

Table 9.5.15/TS 24.008: DEACTIVATE PDP CONTEXT ACCEPT message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2 – 3/2
	Deactivate PDP context accept message identity	Message type 10.4	M	V	1

9.5.16 Activate AA PDP context request (FFS in UMTS)

This message is sent by the MS to the network to initiate activation of an AA PDP context.
See table 9.5.16/TS 24.008.

Message type: ACTIVATE AA PDP CONTEXT REQUEST

Significance: global

Direction: MS to network

Table 9.5.16/TS 24.008: ACTIVATE AA PDP CONTEXT REQUEST message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2 – 3/2
	Activate AA PDP context request message identity	Message type 10.4	M	V	1
	Requested NSAPI	Network service access point identifier 10.5.6.2	M	V	1
	Requested LLC SAPI	LLC service access point identifier 10.5.6.9	M	V	1
	Requested QoS	Quality of service 10.5.6. 5	M	LV	19
	Requested packet data protocol address	Packet data protocol address 10.5.6.4	M	LV	3 - 19
28	Access point name	Access point name 10.5.6.1	O	TLV	3 - 102
27	Protocol configuration options	Protocol configuration options 10.5.6.3	O	TLV	3 - 253
29	Requested AA-READY timer value	GPRS Timer 10.5.7.3	O	TV	2

9.5.16.1 Access point name

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

9.5.16.2 Protocol configuration options

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

9.5.16.3 Requested AA-READY timer value

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

9.5.17 Activate AA PDP context accept (FFS in UMTS)

This message is sent by the network to the MS to acknowledge the activation of an AA PDP context. See table 9.5.17/TS 24.008.

Message type: ACTIVATE AA PDP CONTEXT ACCEPT

Significance: global

Direction: network to MS

Table 9.5.17/TS 24.008: ACTIVATE AA PDP CONTEXT ACCEPT message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2 – 3/2
	Activate AA PDP context accept message identity	Message type 10.4	M	V	1
	Negotiated LLC SAPI	LLC service access point identifier 10.5.6.9	M	V	1
	Negotiated QoS	Quality of service 10.5.6. 5	M	LV	19
	Allocated P-TMSI	Mobile identity 10.5.1.4	M	LV	6
	Packet data protocol address	Packet data protocol address 10.5.6.4	M	LV	3 - 19
	Radio priority	Radio priority 10.5.7.2	M	V	1/2
	Spare half octet	Spare half octet 10.5.1.8	M	V	1/2
27	Protocol configuration options	Protocol configuration options 10.5.6.3	O	TLV	3 - 253
29	Negotiated AA-Ready timer value	GPRS Timer 10.5.7.3	O	TV	2
34	Packet Flow Identifier	Packet Flow Identifier 10.5.6.11	O	TLV	3

9.5.17.1 Protocol configuration options

This IE may be included if the network wishes to transmit protocol configuration options from the external PDN.

9.5.17.2 Negotiated AA-Ready timer value

This IE may be included if the network wants to indicate a value for the AA-READY timer.

9.5.17.3 Packet Flow Identifier

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

9.5.18 Activate AA PDP context reject

This message is sent by the network to the MS to reject the activation of an AA PDP context. See table 9.5.18/TS 24.008.

Message type: ACTIVATE AA PDP CONTEXT REJECT

Significance: global

Direction: network to MS

Table 9.5.18/TS 24.008: ACTIVATE AA PDP CONTEXT REJECT message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2 – 3/2
	Activate AA PDP context reject message identity	Message type 10.4	M	V	1
	SM Cause	SM Cause 10.5.6.6	M	V	1
27	Protocol configuration options	Protocol configuration options 10.5.6.3	O	TLV	3 - 253

9.5.18.1 Protocol configuration options

The protocol configuration options IE may only be inserted by the network (see TS29.060) if the SM Cause indicates "activation rejected by GGSN".

9.5.19 Deactivate AA PDP context request

This message is sent to request deactivation of an active AA PDP context. See table 9.5.19/TS 24.008.

Message type: DEACTIVATE AA PDP CONTEXT REQUEST

Significance: global

Direction: network to MS

Table 9.5.19/TS 24.008: DEACTIVATE AA PDP CONTEXT REQUEST message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2 – 3/2
	Deactivate AA PDP context request message identity	Message type 10.4	M	V	1
	AA deactivation cause	AA deactivation cause 10.5.6.8	M	V	1/2
	Spare half octet	Spare half octet 10.5.1.8	M	V	1/2

9.5.20 Deactivate AA PDP context accept

This message is sent to acknowledge deactivation of an AA PDP context requested by the corresponding *Deactivate AA PDP context request* message. See table 9.5.20/TS 24.008.

Message type: DEACTIVATE AA PDP CONTEXT ACCEPT

Significance: global

Direction: MS to network

Table 9.5.20/TS 24.008: DEACTIVATE AA PDP CONTEXT ACCEPT message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2 – 3/2
	Deactivate AA PDP context accept message identity	Message type 10.4	M	V	1

9.5.21 SM Status

This message is sent by the network or the MS to pass information on the status of the indicated context and report certain error conditions (eg. as listed in section 8). See table 9.5.21/TS 24.008.

Message type: SM Status

Significance: local

Direction: both

Table 9.5.21/TS 24.008: SM STATUS message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2 – 3/2
	SM Status message identity	Message type 10.4	M	V	1
	SM Cause	SM Cause 10.5.6.6	M	V	1

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Umea, Sweden, 28 February - 03 March.2000

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24.008	CR	127	Current Version:	3.2.1

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

For submission to:	TSG#7	for approval	X	strategic		(for SMG use only)
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Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

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

Source: CN1 **Date:** 20.02.2000

Subject: Clarification to the MS handling when receiving detach type 'IMSI detach'.

Work item: GSM/UMTS interworking

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	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change:

In the current version of 24.008 the network-initiated GPRS detach procedure results in the deactivation of all PDP contexts and release of all connections. The network-initiated GPRS detach procedure is however also used to indicate to the MS that it has become IMSI detached only, in which case it is still GPRS attached and fully capable to continue to use the activated PDP contexts. The PDP contexts should therefore not be deactivated in the IMSI detach case.

Furthermore, 24.008 fails to describe the MS behaviour after a Detach Request message with detach type "IMSI Detach" is received.

This CR proposes to define the MS behaviour in the IMSI Detach case in accordance with 23.060 (13.6.4) and 29.018 (4.2.1 and 11.3), and that the PDP contexts are not deactivated in this case.

Clauses affected: 4.7.4.2

Other specs affected:

Other 3G core specifications		→ List of CRs:	04.08 CR A973 (R97)
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

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

4.7.4.2 Network initiated GPRS detach procedure

4.7.4.2.1 Network initiated GPRS detach procedure initiation

The network initiates the GPRS detach procedure by sending a DETACH REQUEST message to the MS. The DETACH REQUEST message shall include a detach type IE. In addition, the network may include a cause IE to specify the reason for the detach request. The network shall start timer T3322. If the detach type IE indicates “re-attach not required” or “re-attach required", the network shall deactivate the PDP contexts and deactivate the logical link(s), if any, and shall change to state GMM-DEREGISTERED-INITIATED. ~~The DETACH REQUEST message shall include a detach type IE. In addition, the network may include a cause IE to specify the reason for the detach request.~~

~~If the detach type IE indicates "re-attach required", the MS shall 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.~~

4.7.4.2.2 Network initiated GPRS detach procedure completion by the MS

When receiving the DETACH REQUEST message and the detach type IE indicates “re-attach not required” or “re-attach required”, the MS shall deactivate the PDP contexts and deactivate the logical link(s), if any. The MS shall then send a DETACH ACCEPT message to the network and shall change state to GMM-DEREGISTERED. The MS shall, after the completion of the GPRS detach procedure, initiate a GPRS attach procedure if indicated by the network in the detach type IE.

A GPRS MS operating in MS operation mode A or B in network operation mode I, which receives an DETACH REQUEST message with detach type indicating "re-attach required" or "re-attach not required" and no cause code, is only detached for GPRS services in the network.

When receiving the DETACH REQUEST message and the detach type IE indicates “IMSI detach”, the MS shall not deactivate the PDP contexts. ~~the~~An MS in operation mode A or B in network operation mode I ~~shall~~may send a DETACH ACCEPT message to the network, and shall re-attach to non-GPRS service by performing the combined routing area updating procedure, sending a ROUTING AREA UPDATE REQUEST message with Update type IE indicating "combined RA/LA updating with IMSI attach". An MS in operation mode C, or in MS operation mode A or B in network operation mode II or III, shall send a DETACH ACCEPT message to the network.

If the detach type IE indicates “IMSI detach”, then the MS shall ignore the cause code if received.

If the detach type information element value indicates "re-attach required" or "re-attach not required" and the MS is attached for GPRS and non-GPRS services and the network operates in network operation mode I, then if in the MS the timer T3212 is not already running, the timer T3212 shall be set to its initial value and restarted.

If the detach type IE indicates "re-attach required", the MS shall 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.

If the detach type IE indicates "re-attach required" or "re-attach not required", then, d~~D~~epending on the received cause code, the MS shall act as follows:

2 (IMSI unknown in HLR)

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

A GPRS MS operating in MS operation mode A or B in network operation mode I, is still IMSI attached for GPRS services in the network.

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 shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. The new GMM state is GMM-DEREGISTERED. The SIM shall be considered as invalid for GPRS services until switching off or the SIM is removed.

A GPRS MS operating in MS operation mode A or B shall in addition set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and 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) 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.

A GPRS MS operating in MS operation mode A or B in network operation mode I, is still IMSI attached for CS services in the network.

8 (GPRS services and non-GPRS services not allowed)

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED and the update status to U3 ROAMING NOT ALLOWED (and shall store it according to section 4.1.3.2). Furthermore, it shall delete any P-TMSI, P-TMSI signature, TMSI, RAI, LAI, ciphering key sequence number and GPRS ciphering key sequence number and shall consider the SIM as invalid for GPRS and non-GPRS services until switching off or the SIM is removed.

11 (PLMN not allowed);

12 (Location area not allowed); or

13 (Roaming not allowed in this location area)

The MS shall delete any RAI or LAI, 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).

A GPRS MS operating in MS operation mode A or B shall in addition set the update status to U3 ROAMING NOT ALLOWED and shall delete any TMSI, LAI and 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.

Other cause values shall not impact the update status. Further actions of the MS are implementation dependent.

4.7.4.2.3 Network initiated GPRS detach procedure completion by the network

The network shall, upon receipt of the DETACH ACCEPT message, stop timer T3322 and shall change state to GMM-DEREGISTERED.

4.7.4.2.4 Abnormal cases on the network side

The following abnormal cases can be identified:

a) T3322 time-out

On the first expiry of the timer, the network shall retransmit the DETACH REQUEST message and shall start timer T3322. This retransmission is repeated four times, i.e. on the fifth expiry of timer T3322, the GPRS detach procedure shall be aborted and the network changes to state GMM-DEREGISTERED.

b) Low layer failure

The GPRS detach procedure is aborted and the network changes to state GMM-DEREGISTERED.

c) GPRS detach procedure collision

If the network receives a DETACH REQUEST message with “switching off” indicated, before the network initiated GPRS detach procedure has been completed, both procedures shall be considered completed.

If the network receives a DETACH REQUEST message without “switching off” indicated, before the network initiated GPRS detach procedure has been completed, the network shall send a DETACH ACCEPT message to the MS.

d) GPRS detach and GPRS attach procedure collision

If the network receives an ATTACH REQUEST message before the network initiated GPRS detach procedure has been completed, the network shall ignore the ATTACH REQUEST message, except when the detach type IE value, sent in the DETACH REQUEST message, indicated that the MS shall perform a GPRS attach procedure. In this case, the detach procedure is aborted and the GPRS attach procedure shall be progressed after the PDP contexts have been deleted.

e) GPRS detach and routing area updating procedure collision

GPRS detach containing detach type "re-attach required" or "re-attach not required":

If the network receives a ROUTING AREA UPDATE REQUEST message before the network initiated GPRS detach procedure has been completed, the detach procedure shall be progressed, i.e. the ROUTING AREA UPDATE REQUEST message shall be ignored.

GPRS detach containing detach type "IMSI detach":

If the network receives a ROUTING AREA UPDATE REQUEST message before the network initiated GPRS detach procedure has been completed, the network shall abort the detach procedure, shall stop T3322 and shall progress the routing area update procedure.

f) GPRS detach and service request procedure collision

If the network receives a SERVICE REQUEST message before the network initiated GPRS detach procedure has been completed, the network shall ignore the SERVICE REQUEST message.

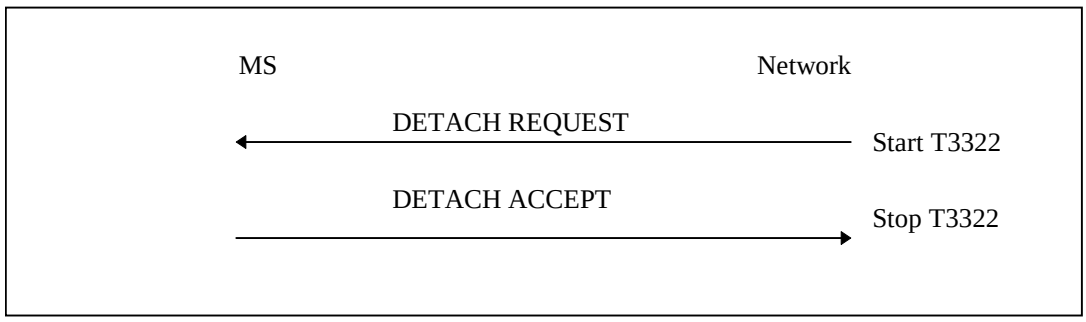

Figure 4.7.4/2 TS 24.008: Network initiated GPRS detach procedure

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Umea, Sweden, 28 February - 03 March.2000

***Document* N1-000395**
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3GPP TSG CN2 SWGB #4
Milan, Italy, 14-16 February 2000

***Document* N2B000320**
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or for SMG, use the format P-99-xxx

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23.009	CR	003	Current Version:	3.1.0

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

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

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 [ ] Core Network [X]

Source: CN1 **Date:** 2000-02-15

Subject: Functional requirements for the use of RANAP over the E i/f

Work item: GSM UMTS Interworking

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	X
				Release 00	

Reason for change: While progressing the work on the introduction of RANAP over the E i/f, TSG-CN SWG N2B has identified necessary changes to 23.009. This CR proposes the necessary changes needed to align with identified requirements during our work.

Clauses affected: 8.3.1

Other specs affected:

Other 3G core specifications	X	→ List of CRs:	29.002-079r3
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:

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8.3.1 Basic relocation procedure requiring a circuit connection between 3G_MSC-A and 3G_MSC-B

The procedure used for successful Inter-3G_MSC SRNS relocation is shown in figure 30. Initiation of the relocation procedure is described in section 5. The procedure described in this section makes use of messages from the Technical Specification GSM 08.08 [5], TS 25.413 [11] and of the transport mechanism from the Mobile Application Part (MAP) (Technical Specification TS 29.002 [12]). After an Inter-3G_MSC SRNS relocation further Intra-3G_MSC relocations may occur on 3G_MSC-B, these relocations will follow the procedures specified in a previous section.

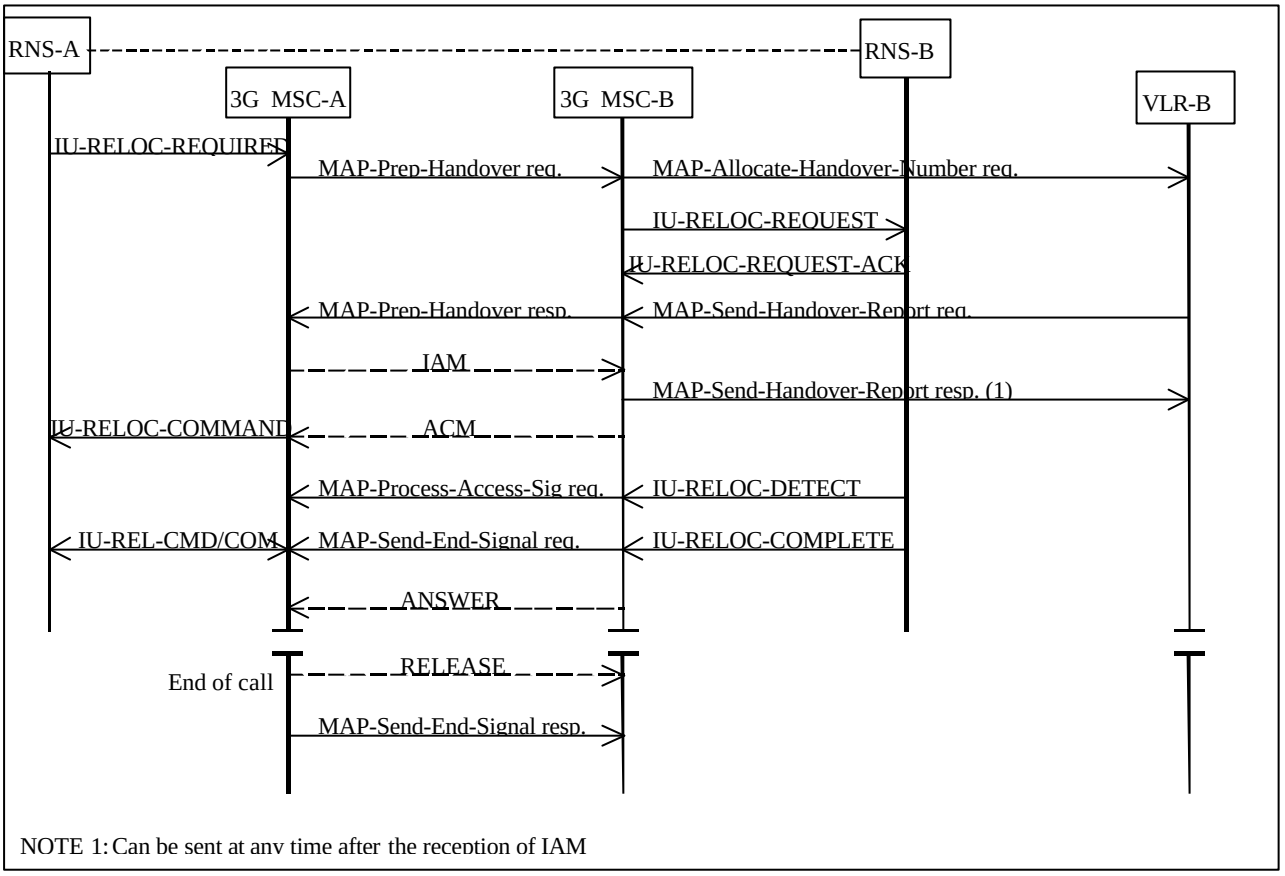

Figure 30: Basic SRNS Relocation Procedure requiring a circuit connection

The relocation is initiated as described in section 6.2.3. (This is represented by IU-RELOC-REQUIRED in figure 30). Upon receipt of the IU-RELOC-REQUIRED from RNS-A, 3G_MSC-A shall send a MAP-PREPARE-HANDOVER request to 3G_MSC-B including a complete ~~A-HO~~IU-RELOC-REQUEST message. (NOTE: 3G_MSC-A shall not send further MAP-PREPARE-HANDOVER requests while a MAP-PREPARE-HANDOVER response is pending or before any timeouts). The MAP-PREPARE-HANDOVER request shall carry in the ~~A-HO~~IU-RELOC-REQUEST all information needed by 3G_MSC-B for allocating radio resources in the case of SRNS relocation without Iur interface, see Technical Specification GSM 08.08 [5]. For compatibility reasons, the MAP-PREPARE-HANDOVER request will also identify the cell to which the call is to be relocated (*the cell id in the MAP message is FFS*). 3G_MSC-B will return the MAP-PREPARE-HANDOVER response after having retrieved ~~a~~ one or several Handover Numbers from its associated VLR (exchange of the messages MAP-allocate-handover-number request and MAP-send-handover-report request). The number of handover numbers to be allocated by 3G_MSC-B depends on the number of radio access bearers (RABs) in use by 3G_MSC-A. The 3G_MSC-B shall extract the RAB identities from the IU-RELOC-REQUEST message. The RAB identities give the number of required handover numbers. 3G_MSC-B associates each RAB identity to a handover number and includes the information in the Relocation Number List of the MAP-PREPARE-HANDOVER response message. The 3G_MSC-A and 3G-MSC-B shall then use this list to match each circuit connection to the correct radio access bearer. The Handover Numbers shall be used for routing the connections of the calls from 3G_MSC-A to 3G_MSC-B. If radio resources are available in 3G_MSC-B, the MAP-PREPARE-HANDOVER response sent to 3G_MSC-A will contain the complete A-HO-REQUEST-ACKNOWLEDGE message generated from the IU-RELOC-REQUEST-ACKNOWLEDGE received from RNS-B, containing the radio resources definition to be sent by RNS-A to the UE (in case of relocation without Iur interface) and possible extra BSSMAP information, amended by 3G_MSC-B due to the possible interworking between the BSSMAP protocol carried on the E-interface and the BSSMAP protocol used on the

A-interface. If the radio resource allocation is queued by RNS-B, the A-QUEUING-INDICATION may optionally be sent back to 3G_MSC-A. The further radio resources allocation result (IU-RELOC-REQUEST-ACK or IU-RELOC-FAILURE sent in MAP as A-HO-REQUEST-ACK or A-HO-FAILURE) will be transferred to 3G_MSC-A using the MAP-PROCESS-ACCESS-SIGNALLING request. If the radio resource allocation is not possible, the MAP-PREPARE-HANDOVER response containing an IU-RELOCATION-FAILURE sent as A-HO-FAILURE will be sent to 3G_MSC-A. 3G_MSC-B will do the same if a fault is detected on the identity of the RNS where the call has to be relocated. 3G_MSC-B simply reports the events related to the dialogue. It is up to 3G_MSC-A to decide the action to perform if it receives negative responses or the operation fails due to the expiry of the MAP-PREPARE-HANDOVER timer.

If an error related to the TCAP dialogue or to the MAP-PREPARE-HANDOVER request is returned from 3G_MSC-B, this will be indicated to 3G_MSC-A and 3G_MSC-A will terminate the relocation attempt. The existing connection to the UE shall not be cleared.

When the A-HO-REQUEST-ACKNOWLEDGE has been received, 3G_MSC-A shall establish a circuit between 3G_MSC-A and 3G_MSC-B by signalling procedures supported by the network. In figure 30 this is illustrated by the messages IAM (Initial Address Message) and ACM (Address Complete Message) of Signalling System no 7. 3G_MSC-B awaits the capturing of the UE (section 6.2.3) on the radio path when the ACM is sent and 3G_MSC-A initiates the relocation execution when ACM is received (illustrated by the IU-RELOC-COMMAND and described in the section 6.2.3).

3G_MSC-B transfers to 3G_MSC-A the acknowledgement received from the correct UE (IU-RELOC-DETECT/IU-RELOC-COMPLETE, sent as A-HO-DETECT/A-HO-COMPLETE). The IU-RELOC-DETECT, if received, is transferred to 3G_MSC-A as A-HO-DETECT using the MAP-PROCESS-ACCESS-SIGNALLING request. The IU-RELOC-COMPLETE, when received from the correct UE, is included in the MAP-SEND-END-SIGNAL request as A-HO-COMPLETE and sent back to 3G_MSC-A. The circuit is through connected in 3G_MSC-A when the A-HO-DETECT or the A-HO-COMPLETE is received from 3G_MSC-B. The old radio resources are released when the A-HO-COMPLETE message is received from 3G_MSC-B. The sending of the MAP-SEND-END-SIGNAL request starts the MAP supervision timer for the MAP dialogue between 3G_MSC-A and 3G_MSC-B. When the MAP-SEND-END-SIGNAL request including the A-HO-COMPLETE message is received in 3G_MSC-A, the resources in RNS-A shall be released.

In order not to conflict with the PSTN/ISDN signalling system(s) used between 3G_MSC-A and 3G_MSC-B, 3G_MSC-B must generate an answer signal when IU-RELOC-DETECT/COMPLETE is received.

3G_MSC-B shall release the Handover Number when the circuit between 3G_MSC-A and 3G_MSC-B has been established.

If the circuit between 3G_MSC-A and 3G_MSC-B cannot be established, (e.g. an unsuccessful backward message is received instead of ACM) 3G_MSC-A terminates the inter-3G_MSC relocation attempt by sending an appropriate MAP message, for example an ABORT.

3G_MSC-A shall retain overall call control until the call is cleared by the fixed subscriber or the UE and there is no further call control functions to be performed (e.g. servicing waiting calls, echo cancellers).

When 3G_MSC-A clears the call to the UE it also clears the call control functions in 3G_MSC-A and sends the MAP-SEND-END-SIGNAL response to release the MAP resources in 3G_MSC-B.

3G_MSC-A may terminate the procedure at any time by sending an appropriate MAP message to 3G_MSC-B. If establishment of the circuit between 3G_MSC-A and 3G_MSC-B has been initiated, the circuit must also be cleared.

The relocation will be aborted by 3G_MSC-A if it detects release or interruption of the radio path before the call has been established on 3G_MSC-B.

3GPP TSG-CN 1 meeting #11
Umeå, Sweden, 28 Feb - 3 Mar 2000

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23.009	CR	006	Current Version:	3.1.0

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

For submission to:	TSG-N #7	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 [ ] Core Network [X]

Source: CN1 **Date:** 2000-02-25

Subject: Introduction of RANAP for intra-UMTS inter-MSC relocation

Work item: GSM UMTS interworking

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

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

Reason for change: Introduction of stage 2 modifications for intra-UMTS inter-MSC relocation corresponding to what has been agreed in S2 and what has been presented for MAP in N2.

This contribution also requests removal of the queuing mechanism at relocation since that mechanism does not exist for relocation in RANAP.

Clauses affected: 1, 2, 4.3.1, 4.4.1, 8.2, 8.3, 11.3, 11.7, 12.3, 12.7, 13.4, 15

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:


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1 Scope

The present document contains a detailed description of the handover procedures to be used in PLMNs. The purpose of the handover procedures, as described in this specification, are to ensure that the connection to the Mobile Station (MS) or User Equipment (UE) is maintained as it moves from one cell or radio network to another. The document defines the circuit switched handover functionality based on the service requirements in TS 22.129 [9].

This specification considers the following four cases:

i) Handover between Base Stations connected to the same MSC, this is termed an Intra-MSC handover.

ii) Handover between Radio Network Subsystems connected to the same 3G_MSC, this is termed an Intra-3G_MSC handover/relocation. This case also includes inter-system handover between RNS and BSS if the 3G_MSC supports the A-interface.

iii) Handover between Base Stations connected to different MSCs, this is termed an Inter-MSC handover. This category can be sub-divided into three further procedures:

a) the Basic Inter-MSC Handover procedure, where the MS is handed over from a controlling MSC (MSC-A) to another MSC (MSC-B);

b) the Subsequent Inter-MSC Handover procedure, where the MS is handed over from MSC-B to a third MSC (MSC-B');

c) the Subsequent Inter-MSC handback, where the MS is handed back from MSC-B to MSC-A.

iv) Handover between Radio Network Subsystems connected to different 3G_MSCs, this is termed an Inter-3G_MSC handover/relocation. This category can be divided into three further sub-procedures:

a) the Inter-3G_MSC Handover procedure from UMTS to GSM, where the UE/MS is handed over from a controlling 3G_MSC (3G_MSC-A) to an MSC (MSC-B);

b) the Inter-3G_MSC Handover procedure from GSM to UMTS, where the UE/MS is handed over from a controlling MSC (MSC-A) to a 3G_MSC (3G_MSC-B);

c) the Inter-3G_MSC Relocation procedure, where the UE is relocated from 3G_MSC-A to 3G_MSC-B. This procedure can also be combined with a hard change of radio resources (Hard Handover with switch in the core network).

The MSC in this category can optionally be a 3G_MSC supporting the A-interface. The three sub-procedures do also cover subsequent handover/relocation to a third MSC-B' or 3G_MSC-B' and subsequent handover/relocation back to MSC-A or 3G_MSC-A.

In both cases i) and iii) the same procedures as defined in the GSM 08.08 [5] and the TS 24.008 [10] shall be used on the A-interface and on the Radio Interface, respectively.

In case ii) the same procedures as defined in the TS 25.413 [11] and the TS 24.008 [10] shall be used on the Iu-interface. If the 3G_MSC in case ii) also supports the A-interface, the GSM 08.08 [5] and the TS 24.008 [10] shall be used on the A-interface.

In case iii) the handover procedures shall transport the A-interface messages between MSC-A and MSC-B described in the Mobile Application Part (MAP), TS 29.002 [12].

In case iv) the handover procedures shall transport the A-interface messages between 3G_MSC and MSC described in the Mobile Application Part (MAP), TS 29.002 [12].

In case iv) the relocation procedure shall transport the Iu-interface messages ~~as BSSMAP messages~~ between 3G_MSC-A and 3G_MSC-B described in the Mobile Application Part (MAP), TS 29.002 [12].

The interworking between the TS 29.002 [12] protocol and the GSM 08.08 [5] protocol is described in the GSM 09.10 [8] Technical Specification.
Handovers, which take place on the same MSC are termed Intra-MSC handovers; this includes both Inter-BSS and Intra-BSS handovers.

Handovers, which take place on the same 3G_MSC are termed Intra-3G_MSC handovers; this includes Inter-RNS handovers and optionally RNS to BSS and BSS to RNS handovers.

The present document also covers the requirements for handover in ongoing GSM voice group calls, directed retry and handover without a circuit connection between (U)MSCs. The present document does not consider the case of handovers between radio channels on the same BSS (Intra-BSS handover) or the handover of packet radio services. The Inter-RNS handover case that results in a relocation is covered by this document but not other Inter-RNS or Intra-RNS handover cases.

For voice broadcast calls in GSM, the speaker uses normal point-to-point handover procedures, whilst the listeners use idle mode cell reselection procedures, as for the voice group call listeners.

Voice group calls is only applicable to GSM and handover of voice group calls is therefore only possible in GSM.

Inter-MSC hand-over imposes a few limitations on the system. After inter-MSC hand-over:

- call re-establishment is not supported.

The list of GSM 08.08 [5] features supported during and after Inter-MSC handover is given in GSM 09.08 [7].

In the Inter-MSC handover case, the interworking between a Phase 1 BSSMAP protocol possibly used by one MSC and the Phase 2 BSSMAP protocol used in the Phase 2 MAP protocol on the E-interface is performed by this MSC.NOTE: The message primitive names used in the SDL diagrams and message flows in this technical specification do not represent the actual messages specified in the GSM or 3GPP stage 3 technical specifications. The primitive names are only intended to be indicative of their use in this document.

Next Change

2 References

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

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

[1] ITU-T Recommendation Q.118: "Special release arrangements".

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

[2a] TS 21.905: "3G Vocabulary"

[3] GSM 03.68: "Digital cellular telecommunications system (Phase 2+); Voice Group Call Service (VGCS) - Stage 2."

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

[5] GSM 08.08: "Digital cellular telecommunications system (Phase 2+); Mobile Switching Centre - Base Station System (MSC - BSS) interface; Layer 3 specification".

[6] GSM 08.58: "Digital cellular telecommunications system (Phase 2+); Base Station Controller - Base Transceiver Station (BSC - BTS) interface; Layer 3 specification".

[7] GSM 09.08: "Digital cellular telecommunications system (Phase 2+); Application of the Base Station System Application Part (BSSAP) on the E-interface".

[8] TS 29.010: " Information element mapping between Mobile Station - Base Station System (MS-BSS) and Base Station System - Mobile-services Switching Centre (BSS - MSC); Signalling procedures and the Mobile Application Part (MAP)".

[9] TS 22.129: "Handover Requirements between UMTS and GSM or other Radio Systems".

[10] TS 24.008: "Mobile radio interface layer 3 specification".

[11] TS 25.413: "UTRAN Iu interface RANAP signalling".

[12] TS 29.002: "Mobile Application Part (MAP) specification".

[13] TS 25.303: “Interlayer procedures in Connected Mode”

[14] TS 25.331: “RRC Protocol Specification”

[15] TS 29.108: “Application Part (RANAP) on the E-interface”

Next Change

4.3.1 Role of 3G_MSC-A

In the Intra-3G_MSC handover/relocation case, the 3G_MSC-A (simply termed 3G_MSC) controls the call, the mobility management and the radio resources before, during and after an Intra-3G_MSC handover/relocation. When RANAP procedures have to be performed, they are initiated and driven by 3G_MSC-A.

In the Inter-3G_MSC handover/relocation case, 3G_MSC-A is the 3G_MSC that controls the call and the mobility management of the UE/MS during the call, before, during and after a basic or subsequent handover/relocation. When RANAP procedures related to dedicated resources have to be performed towards the UE/MS, they are initiated and driven by 3G_MSC-A. The 3G_MSC-A - 3G_MSC-B interface works as a 3G_MSC - ~~BS~~RNS interface for the RANAP procedures~~, sent as BSSMAP procedures~~. The Direct Transfer signalling is relayed transparently by 3G_MSC-B between 3G_MSC-A and the UE/MS.

During a basic handover/relocation, 3G_MSC-A initiates and controls all the handover/relocation procedure, from its initiation (reception of Relocation Required from RNS-A on Iu-interface) until its completion (reception of Relocation Complete from 3G_MSC-B on E-interface).

During a subsequent handover/relocation back to 3G_MSC-A, 3G_MSC-A acts as an RNS towards 3G_MSC-B, which controls the handover/relocation procedure until the termination in 3G_MSC-A of the handover radio resources allocation (sending of the Relocation Request Acknowledge to 3G_MSC-B from 3G_MSC-A). Then all handover/relocation related messages shall terminate at 3G_MSC-A (e.g. Relocation Detect/Complete from RNS-B, Relocation Failure from RNS-A).

During a subsequent handover/relocation to a third 3G_MSC, 3G_MSC-A works towards 3G_MSC-B' as described above in the basic handover/relocation paragraph and towards 3G_MSC-B as described above in subsequent handover/relocation paragraph.

In the Inter-System, inter-3G_MSC handover case, 3G_MSC-A is the 3G_MSC which controls the call and the mobility management of the UE/MS during the call, before, during and after a basic or subsequent inter-system handover. When BSSAP procedures related to dedicated resources have to be performed towards the UE/MS, they are initiated and driven by 3G_MSC-A. The 3G_MSC-A – MSC-B interface works as a 3G_MSC – BSS interface for a subset of BSSMAP procedures. These BSSMAP procedures described in GSM 09-08 are those related to dedicated resources. The DTAP signalling is relayed transparently by MSC-B between 3G_MSC-A and the UE/MS.

During a basic inter-system handover, 3G_MSC-A initiates and controls all the handover procedure, from its initiation (reception of Relocation Required from RNS-A on Iu-interface) until its completion (reception of Handover Complete from MSC-B on E-interface).

During a subsequent inter-system handover back to 3G_MSC-A, 3G_MSC-A acts as a BSS towards MSC-B, which controls the handover procedure until the termination in 3G_MSC-A of the handover radio resources allocation (sending of the Handover Request Acknowledge to MSC-B from 3G_MSC-A). Then all handover related messages shall terminate at 3G_MSC-A (e.g. Handover Detect/Complete from BSS-B, Relocation Failure from RNS-A).

During a subsequent inter-system handover to a third 3G_MSC, 3G_MSC-A works towards MSC-B' as described above in the basic inter-system handover paragraph and towards 3G_MSC-B as described above in subsequent inter-system handover paragraph.

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4.4.1 Role of 3G_MSC-B

In the Intra-3G_MSC handover/relocation case, the 3G_MSC-B keeps the control of the whole Intra-3G_MSC handover/relocation procedure.

In the Inter-3G_MSC handover/relocation case, the role of 3G_MSC-B (3G_MSC-B') is only to provide radio resources control within its area. This means that 3G_MSC-B keeps control of the radio resources connection and release towards RNS-B. 3G_MSC-B will do some processing on the ~~BSSMAP~~ RANAP information received on the E-interface or the RANAP information received on the Iu-interface whereas it will relay the Direct Transfer information transparently between Iu-interface and E-interface. 3G_MSC-A initiates and drives RANAP procedures ~~as BSSMAP procedures~~ towards 3G_MSC-B, while 3G_MSC-B controls them towards its RNSs to the extent that 3G_MSC-B is responsible for the connections of its RNSs. The release of the dedicated resources between 3G_MSC-B and RNS-B is under the responsibility of 3G_MSC-B and RNS-B, and is not directly controlled by 3G_MSC-A. When clearing is to be performed due to information received from RNS-B, 3G_MSC-B shall transfer this clearing indication to 3G_MSC-A, to clear its connection with RNS-B, to terminate the dialogue with 3G_MSC-A through the E-interface, and to release its circuit connection with 3G_MSC-A, if any. In the same way, the release of the connection to its RNS-B, is initiated by 3G_MSC-B, when the dialogue with 3G_MSC-A ends normally and a release is received from the circuit connection with 3G_MSC-A, if any, or when the dialogue with the 3G_MSC-A ends abnormally.

When a release is received by 3G_MSC-B for the circuit connection with 3G_MSC-A then 3G_MSC-B shall release the circuit connection.

In the Inter-system Inter-3G_MSC handover case, the role of 3G_MSC-B (3G_MSC-B') is only to provide radio resources control within its area. This means that 3G_MSC-B keeps control of the radio resources connection and release towards RNS-B. 3G_MSC-B will do some processing on the BSSMAP information received on the E-interface or the RANAP information received on the Iu-interface whereas it will relay the Direct Transfer information transparently between Iu-interface and E-interface. MSC-A initiates and drives a subset of BSSMAP procedures towards 3G_MSC-B, while 3G_MSC-B controls them towards its RNSs to the extent that 3G_MSC-B is responsible for the connections of its RNSs. The release of the dedicated resources between 3G_MSC-B and RNS-B is under the responsibility of 3G_MSC-B and RNS-B, and is not directly controlled by MSC-A. When clearing is to be performed due to information received from RNS-B, 3G_MSC-B shall transfer this clearing indication to MSC-A, to clear its connection with RNS-B, to terminate the dialogue with MSC-A through the E-interface, and to release its circuit connection with MSC-A, if any. In the same way, the release of the connection to its RNS-B, is initiated by 3G_MSC-B, when the dialogue with MSC-A ends normally and a release is received from the circuit connection with MSC-A, if any, or when the dialogue with the MSC-A ends abnormally.

When a release is received by 3G_MSC-B for the circuit connection with MSC-A then 3G_MSC-B shall release the circuit connection.

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8.2.1 Basic Handover procedure requiring a circuit connection between MSC-A and 3G_MSC-B

The procedure used for successful Inter-3G_MSC Handover from GSM to UMTS is shown in figure 24. Initiation of the GSM to UMTS handover procedure is described in section 5. The procedure described in this section makes use of messages from the Technical Specification GSM 08.08 [5], TS 25.413 [11] and of the transport mechanism from the Mobile Application Part (MAP) (TS 29.002 [12]). After an Inter-3G_MSC handover further Intra-3G_MSC handovers may occur on 3G_MSC-B, these handovers will follow the procedures specified in the previous sections.

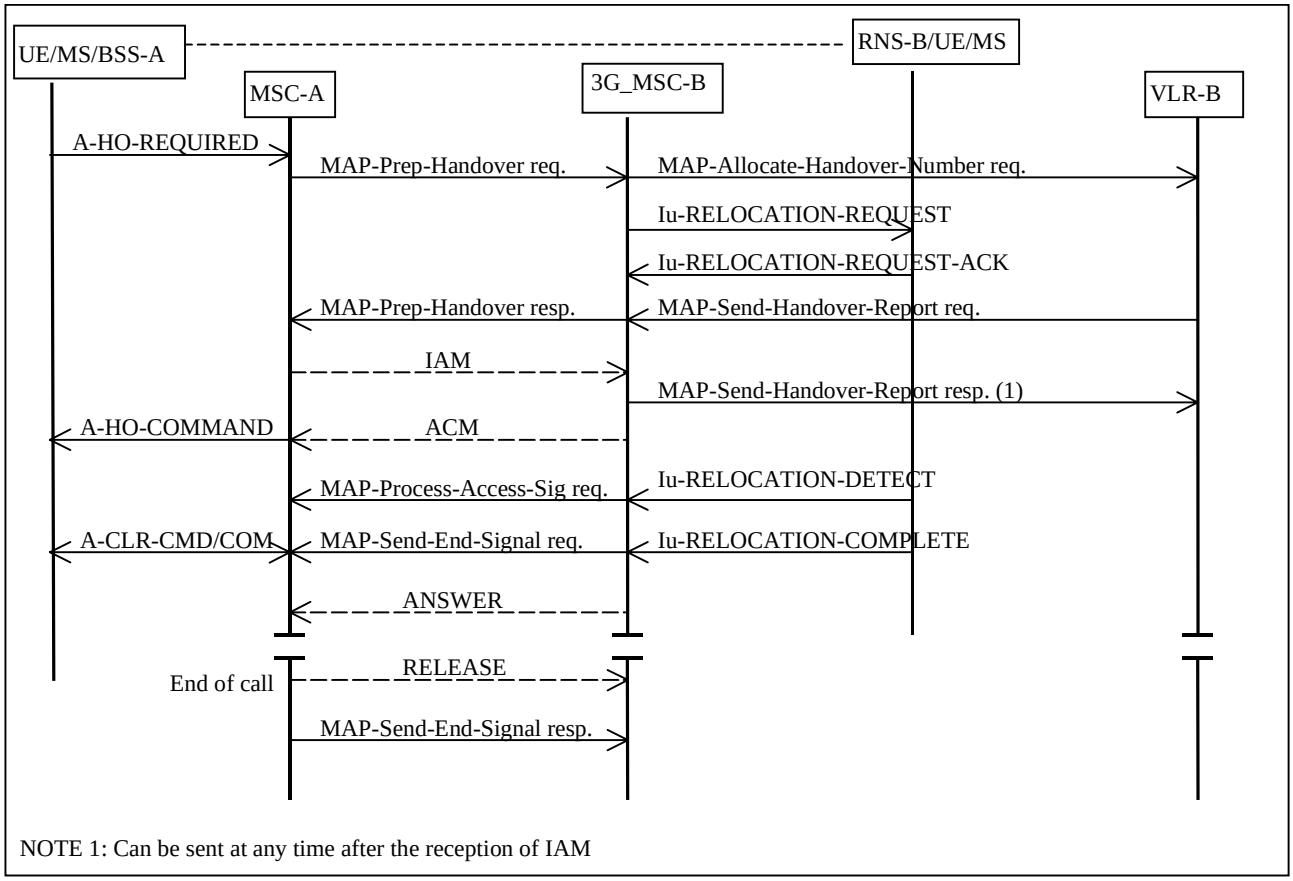

Figure 24: Basic GSM to UMTS Handover Procedure requiring a circuit connection

The GSM to UMTS handover is initiated as described in section 6.2.2. (This is represented by A-HO-REQUIRED in figure 24). Upon receipt of the A-HO-REQUIRED from BSS-A, MSC-A shall send a MAP-PREPARE-HANDOVER request to 3G_MSC-B including a complete A-HO-REQUEST message. (NOTE: MSC-A shall not send further MAP-PREPARE-HANDOVER requests while a MAP-PREPARE-HANDOVER response is pending or before any timeouts). The MAP-PREPARE-HANDOVER request shall carry in the A-HO-REQUEST all information needed by 3G_MSC-B for allocating radio resources in RNS-B, see Technical Specification GSM 08.08 [5]. For compatibility reasons, the MAP-PREPARE-HANDOVER request will also identify the cell to which the call is to be handed over. 3G_MSC-B will return the MAP-PREPARE-HANDOVER response after having retrieved a Handover Number from its associated VLR (exchange of the messages MAP-allocate-handover-number request and MAP-send-handover-report request). The Handover Number shall be used for routing the connection of the call from MSC-A to 3G_MSC-B. If radio resources are available in RNS-B the MAP-PREPARE-HANDOVER response, sent to MSC-A from 3G_MSC-B will contain the complete A-HO-REQUEST-ACK message generated from the Iu-RELOCATION-REQUEST-ACK received from RNS-B, containing the radio resources definition to be sent by BSS-A to the UE/MS. ~~If the radio resource allocation is queued by RNS-B, the A-QUEUING-INDICATION may optionally be sent back to MSC-A. The further radio resource allocation result (A-HO-REQUEST-ACK generated from Iu-RELOCATION-REQUEST-ACK received from RNS-B or A-HO-FAILURE generated from RELOCATION FAILURE received from RNS-B) will be transferred to MSC-A using the MAP-PROCESS-ACCESS-SIGNALLING request.~~ If the radio resource allocation is not possible, the MAP-PREPARE-HANDOVER response containing an A-HO-FAILURE will be sent to MSC-A. 3G_MSC-B will do the

same if a fault is detected on the identity of the cell where the call has to be handed over. 3G_MSC-B simply reports the events related to the dialogue. It is up to MSC-A to decide the action to perform if it receives negative responses or the operation fails due to the expiry of the MAP-PREPARE-HANDOVER timer.

If an error related to the TCAP dialogue or to the MAP-PREPARE-HANDOVER request is returned from 3G_MSC-B, this will be indicated to MSC-A and MSC-A will terminate the handover attempt. MSC-A shall reject the handover attempt towards BSS-A. The existing connection to the UE/MS shall not be cleared.

When the A-HO-REQUEST-ACK has been received, MSC-A shall establish a circuit between MSC-A and 3G_MSC-B by signalling procedures supported by the network. In figure 24 this is illustrated by the messages IAM (Initial Address Message) and ACM (Address Complete Message) of Signalling System no 7. 3G_MSC-B awaits the capturing of the UE/MS (section 6.2.2) on the radio path when the ACM is sent and MSC-A initiates the handover execution when ACM is received (illustrated by the A-HO-COMMAND and described in the section 6.2.2).

3G_MSC-B transfers to MSC-A the acknowledgement received from the correct UE/MS (A-HO-DETECT/A-HO-COMPLETE). The Iu-RELOCATION-DETECT, if received, is converted to A-HO-DETECT and transferred to MSC-A using the MAP-PROCESS-ACCESS-SIGNALLING request. The Iu-RELOCATION-COMPLETE, when received from the correct UE/MS, is converted to A-HO-COMPLETE and included in the MAP-SEND-END-SIGNAL request and sent back to MSC-A. The circuit is through-connected in MSC-A when the A-HO-DETECT or the A-HO-COMPLETE is received from 3G_MSC-B. The old radio channel is released when the A-HO-COMPLETE message is received from 3G_MSC-B. The sending of the MAP-SEND-END-SIGNAL request starts the MAP supervision timer for the MAP dialogue between MSC-A and 3G_MSC-B. When the MAP-SEND-END-SIGNAL request including the A-HO-COMPLETE message is received in MSC-A the resources in BSS-A shall be cleared.

In order not to conflict with the PSTN/ISDN signalling system(s) used between MSC-A and 3G_MSC-B, 3G_MSC-B must generate an answer signal when Iu-RELOCATION-DETECT/COMPLETE is received.

3G_MSC-B shall release the Handover Number when the circuit between MSC-A and 3G_MSC-B has been established.

If the circuit between MSC-A and 3G_MSC-B cannot be established (e.g. an unsuccessful backward message is received instead of ACM). MSC-A terminates the inter3G_MSC handover attempt by sending an appropriate MAP message, for example an ABORT.

MSC-A shall retain overall call control until the call is cleared by the fixed subscriber or the UE/MS and there is no further call control functions to be performed (e.g. servicing waiting calls, echo cancellers).

When MSC-A clears the call to the UE/MS it also clears the call control functions in MSC-A and sends the MAP-SEND-END-SIGNAL response to release the MAP resources in 3G_MSC-B.

MSC-A may terminate the procedure at any time by sending an appropriate MAP message to 3G_MSC-B. If establishment of the circuit between MSC-A and 3G_MSC-B has been initiated, the circuit must also be cleared.

The GSM to UMTS handover will be aborted by MSC-A if it detects clearing or interruption of the radio path before the call has been established on 3G_MSC-B.

8.2.2 Basic GSM to UMTS Handover procedure not requiring the establishment of a circuit connection between MSC-A and 3G_MSC-B

The basic GSM to UMTS handover procedures to be used when no circuit connection is required by MSC-A are similar to those described in section 8.2.1 for circuit switched calls. The main differences to the procedures described in section 8.2.1 relate to the establishment of circuits between the network entities and the Handover Number allocation.

In the case of basic GSM to UMTS handover, MSC-A shall specify to 3G_MSC-B that no Handover Number is required in the MAP-PREPARE-HANDOVER request (see TS 29.002 [12]). As for the basic GSM to UMTS handover using a circuit connection, the A-HO-REQUEST is transmitted at the same time. Any subsequent Handover Number allocation procedure will not be invoked until the completion of the basic GSM to UMTS handover procedure (see section: Subsequent Channel Assignment using a circuit connection). 3G_MSC-B shall then perform the radio resources allocation as described in section 8.2.1. The MAP-PREPARE-HANDOVER response shall be returned to MSC-A including either the translated response of the radio resources allocation request received from RNS-B (A-HO-REQUEST-ACK/A-HO-FAILURE) ~~or potentially the A-QUEUING-INDICATION~~. The basic GSM to UMTS

handover procedure will continue as described in section 8.2.1 except that no circuit connection will be established towards 3G_MSC-B.

The relevant case for the basic GSM to UMTS handover without circuit connection is shown in figure 25. As can be seen the major differences to the equivalent figure 24 are the omission of any circuit establishment messaging and the omission of handover number allocation signalling.

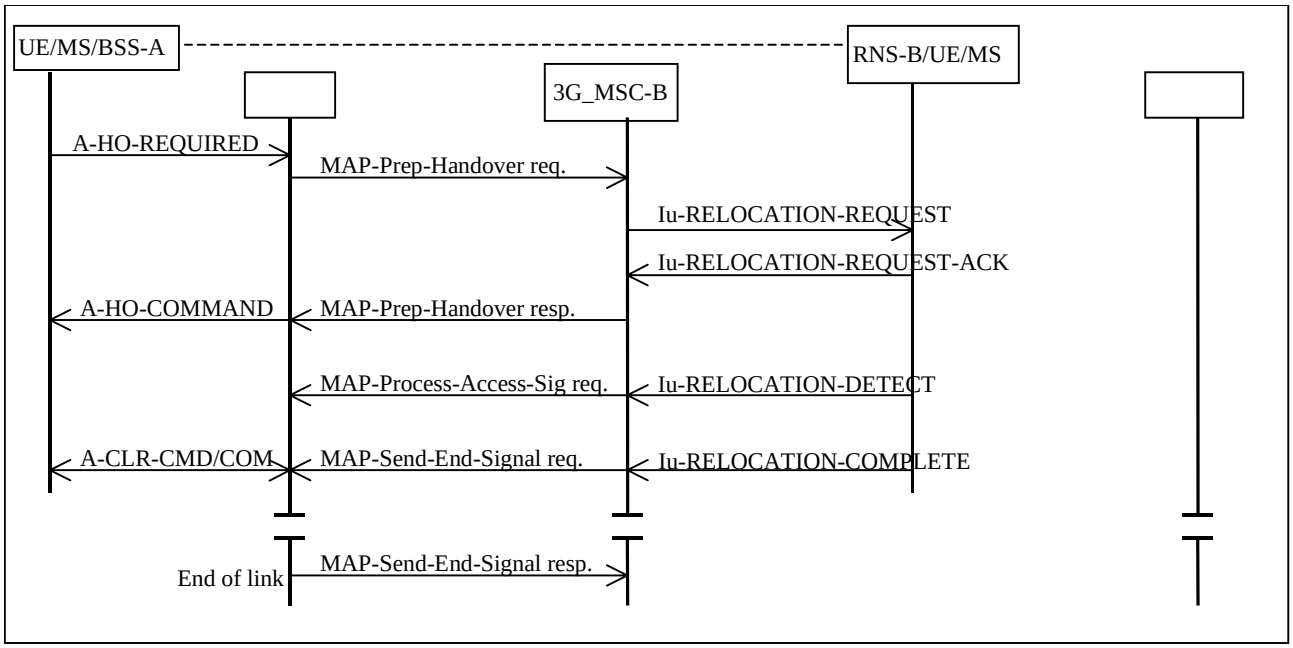

Figure 25: Basic GSM to UMTS Handover Procedure without circuit connection

8.2.3 Procedure for subsequent GSM to UMTS handover requiring a circuit connection between 3G_MSC-A and MSC-B

After the call has been handed over to MSC-B, if the UE/MS leaves the GSM area of MSC-B during the same call and enters a UTRAN area, subsequent GSM to UMTS handover is necessary in order to continue the connection.

The following cases apply:

i) the UE/MS moves back to the area of 3G_MSC-A;

ii) the UE/MS moves into the area of a third 3G_MSC (3G_MSC-B').

In both cases the call is switched in 3G_MSC-A; the circuit between 3G_MSC-A and MSC-B shall be released after a successful subsequent handover has been performed.

8.2.3.1 Description of subsequent GSM to UMTS handover procedure i): MSC-B to 3G_MSC-A

The procedure for successful GSM to UMTS handover from MSC-B back to 3G_MSC-A is shown in figure 26.

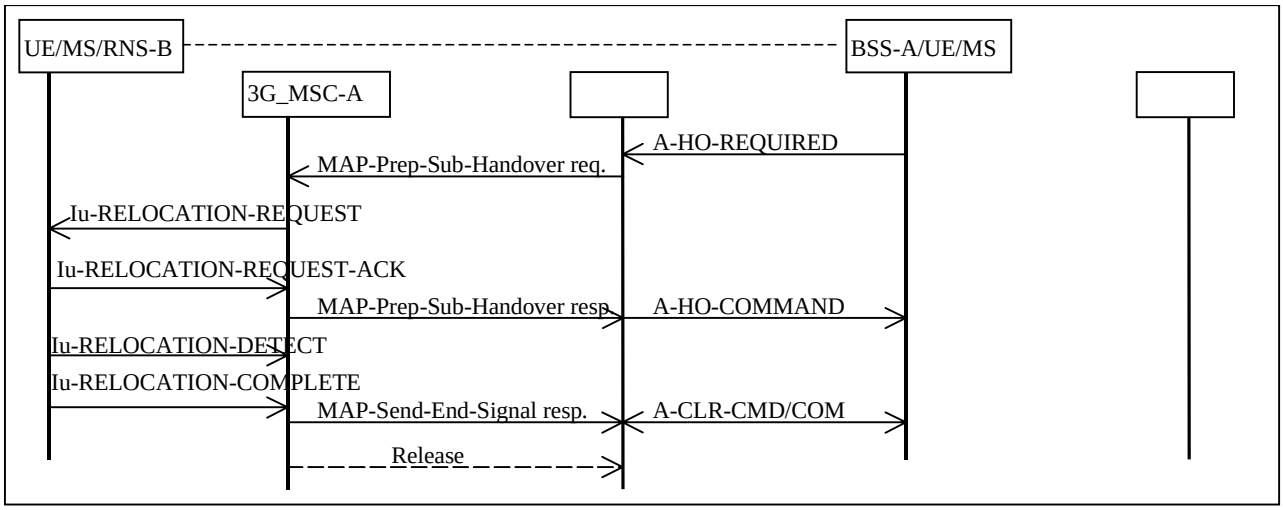

Figure 26: Subsequent GSM to UMTS handover procedure i): successful handover from MSC-B to 3G_MSC-A using a circuit connection

The procedure is as follows:

MSC-B sends the MAP-PREPARE-SUBSEQUENT-HANDOVER request to 3G_MSC-A indicating the new MSC number (3G_MSC-A number), indicating also the identity of the cell where the call has to be handed over and including a complete A-HO-REQUEST message. (NOTE: MSC-B shall not send further MAP-PREPARE-SUBSEQUENT-HANDOVER requests while a handover attempt is pending or before any timeouts). Since 3G_MSC-A is the call controlling MSC, this MSC needs no Handover Number for routing purposes; 3G_MSC-A can immediately initiate the search for free radio resources.

When radio resources can be assigned, 3G_MSC-A shall return in the MAP-PREPARE-SUBSEQUENT-HANDOVER response the complete A-HO-REQUEST-ACK message generated from the Iu-RELOCATION-REQUEST-ACK received from the RNS-B and possible extra BSSMAP information, amended by 3G_MSC-A due to the possible interworking between the BSSMAP protocol carried on the E-interface and the RANAP protocol used on the Iu-interface. ~~If the radio resource allocation is queued by RNS-B, the A-QUEUING-INDICATION may optionally be sent back to MSC-B. The further radio resource allocation result (A-HO-REQUEST-ACK or A-HO-FAILURE) will be transferred to MSC-B using the MAP-FORWARD-ACCESS-SIGNALLING request.~~ If radio resources cannot be assigned or if a fault is detected on the target cell identity, or the target cell identity in the A-HO-REQUEST is not consistent with the target MSC number, the MAP-PREPARE-SUBSEQUENT-HANDOVER response containing an A-HO-FAILURE message shall be given to MSC-B, in addition MSC-B shall maintain the connection with the UE/MS.

If the procedure in 3G_MSC-A is successful then MSC-B can request the UE/MS to retune to the new RNS-B on 3G_MSC-A. This is illustrated in figure 26 by the A-HO-COMMAND message. The operation is successfully completed when 3G_MSC-A receives the Iu-RELOCATION-COMPLETE message.

After GSM to UMTS handover 3G_MSC-A shall release the circuit to MSC-B.

3G_MSC-A must also terminate the MAP procedure for the basic handover between 3G_MSC-A and MSC-B by sending an appropriate MAP message. MSC-B will clear the resources in BSS-A when the MAP-SEND-END-SIGNAL response is received.

8.2.3.2 Description of subsequent GSM to UMTS handover procedure ii): MSC-B to 3G_MSC-B''

The procedure for successful GSM to UMTS handover from MSC-B to 3G_MSC-B' is shown in figure 27.

The procedure consists of two parts:

- a subsequent handover from MSC-B back to MSC-A as described in section 7.3.1 (MSC-A can also be a 3G_MSC, the procedure is the same in both cases); and

- a basic GSM to UMTS handover from MSC-A to 3G_MSC-B' as described in section 8.2.1.

MSC-B sends the MAP-PREPARE-SUBSEQUENT-HANDOVER request to MSC-A indicating a new MSC number (which is the identity of 3G_MSC-B'), indicating also the target cell identity and including a complete A-HO-REQUEST, MSC-A then starts a basic handover procedure towards 3G_MSC-B'.

When MSC-A receives the ACM from 3G_MSC-B', MSC-A informs MSC-B that 3G_MSC-B' has successfully allocated the radio resources on RNS-B' side by sending the MAP-PREPARE-SUBSEQUENT-HANDOVER response containing the complete A-HO-REQUEST-ACK generated from the RELOCATION-REQUEST-ACK received from RNS-B' and possible extra BSSMAP information, amended by MSC-A due to the possible interworking between the BSSMAP protocol carried on the E-interface between MSC-A and 3G_MSC-B' and the BSSMAP protocol carried on the E-interface between MSC-A and MSC-B. Now MSC-B can start the procedure on the radio path.

For MSC-A the handover is completed when it has received the MAP-SEND-END-SIGNAL REQUEST from 3G_MSC-B' containing the A-HO-COMPLETE generated from Iu-RECOLATION COMPLETE received from the RNS-B'. The circuit between MSC-A and MSC-B is released. MSC-A also sends the MAP-SEND-END-SIGNAL response to MSC-B in order to terminate the original MAP dialogue between MSC-A and MSC-B. MSC-B releases the radio resources when it receives this message.

~~If the radio resource allocation is queued by the RNS-B', the A-QUEUING-INDICATION may optionally be sent back to MSC-B.~~ If no radio resources can be allocated by 3G_MSC-B' or no circuit between MSC-A and 3G_MSC-B' can be established or a fault is detected on the target cell identity or the target cell identity in the A-HO-REQUEST is not consistent with the target MSC number, MSC-A informs MSC-B by using the A-HO-FAILURE message included in the MAP-PREPARE-SUBSEQUENT-HANDOVER response. MSC-B shall maintain the existing connection with the UE/MS.

When the subsequent GSM to UMTS handover is completed, 3G_MSC-B' is considered as 3G_MSC-B. Any further inter-MSC handover is handled as described above for a subsequent handover.

Next Change

8.3 SRNS Relocation

The following sections describe two options for the Basic and Subsequent Relocation procedures. The first, as described in section 8.3.1 and 8.3.3 respectively, provides for a circuit connection between 3G_MSC-A and 3G_MSC-B. The second, as described in section 8.3.2 and 8.3.4 respectively, provides for a Basic and Subsequent Relocation without the provision of a circuit connection between 3G_MSC-A and 3G_MSC-B.

In all the above mentioned sections, the following principles apply:

During the relocation resource allocation, only the handover related messages that are part of the applicable ~~BSSAP~~RANAP subset - as defined in ~~GSM 09.08[7]~~ TS 29.108 [15] - shall be transferred on the E-interface.

The trace related messages that are part of the applicable ~~BSSAP~~ RANAP subset - as defined in ~~GSM 09.08 [7]~~ TS 29.108 [15] - can be sent by the 3G_MSC-A on the E-interface after successful relocation resource allocation. In the sections 8.3.1 and 8.3.2, it is however allowed at basic relocation initiation on the E-Interface to transfer one trace related message that is part of the applicable ~~BSSAP~~ RANAP subset - as defined in ~~GSM 09.08 [7]~~ TS 29.108 [15] - together with the applicable ~~handover~~ relocation related message. The applicable relocation ~~handover~~ related message shall always appear as the first message.

During the relocation execution, i.e. while the UE is not in communication with the network, the 3G_MSC-A shall queue all outgoing RANAP messages until the communication with the UE is resumed.

Finally, during supervision, i.e. while the UE is not in the area of 3G_MSC-A after a successful Inter-3G_MSC relocation, the subset of ~~BSSAP~~ RANAP procedures and their related messages - as defined in TS 29.108 [15] ~~GSM 09.08 [7]~~ - shall apply on the E-Interface.

During the intra-3G_MSC-B relocation execution, if any, the 3G_MSC-B shall queue all outgoing RANAP messages until the communication with the UE is resumed.

8.3.1 Basic relocation procedure requiring a circuit connection between 3G_MSC-A and 3G_MSC-B

The procedure used for successful Inter-3G_MSC SRNS relocation is shown in figure 30. Initiation of the relocation procedure is described in section 5. The procedure described in this section makes use of messages from the ~~Technical Specification GSM 08.08 [5],~~ TS 25.413 [11] and of the transport mechanism from the Mobile Application Part (MAP) (Technical Specification TS 29.002 [12]). After an Inter-3G_MSC SRNS relocation further Intra-3G_MSC relocations may occur on 3G_MSC-B, these relocations will follow the procedures specified in a previous section.

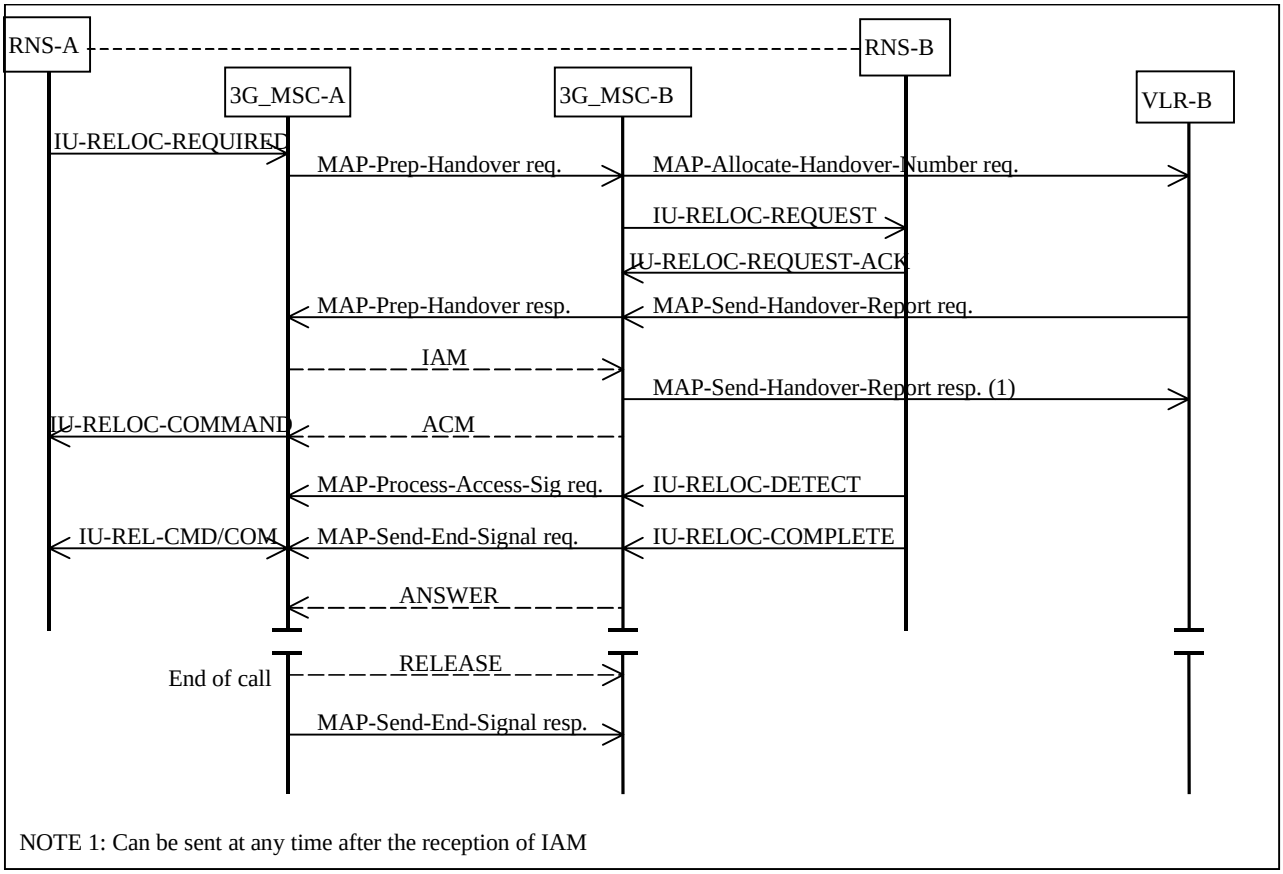

Figure 30: Basic SRNS Relocation Procedure requiring a circuit connection

The relocation is initiated as described in section 6.2.3. (This is represented by IU-RELOC-REQUIRED in figure 30). Upon receipt of the IU-RELOC-REQUIRED from RNS-A, 3G_MSC-A shall send a MAP-PREPARE-HANDOVER request to 3G_MSC-B including a complete ~~A-HO~~IU-RELOC-REQUEST message. (NOTE: 3G_MSC-A shall not send further MAP-PREPARE-HANDOVER requests while a MAP-PREPARE-HANDOVER response is pending or before any timeouts). The MAP-PREPARE-HANDOVER request shall carry in the ~~A-HO~~IU-RELOC-REQUEST all information needed by 3G_MSC-B for allocating radio resources in the case of SRNS relocation without Iur interface, see ~~Technical Specification GSM 08.08 [5]~~TS 25.413 [11]. MAP-PREPARE-HANDOVER request shall also carry the identity of the target RNS to which the call is to be relocated, see TS 29.002. ~~For compatibility reasons, the MAP-PREPARE-HANDOVER request will also identify the cell to which the call is to be relocated (*the cell id in the MAP message is FFS*)~~. 3G_MSC-B will return the MAP-PREPARE-HANDOVER response after having retrieved a Handover Number from its associated VLR (exchange of the messages MAP-allocate-handover-number request and MAP-send-handover-report request). The Handover Number shall be used for routing the connection of the call from 3G_MSC-A to 3G_MSC-B. If radio resources are available in 3G_MSC-B, the MAP-PREPARE-HANDOVER response sent to 3G_MSC-A will contain the complete ~~A-HO-REQUEST-ACKNOWLEDGE message generated from the~~ IU-RELOC-REQUEST-ACKNOWLEDGE message received from RNS-B, containing the radio resources definition to be sent by RNS-A to the UE (in case of relocation without Iur interface) and possible extra ~~BSSM~~RANAP information, amended by 3G_MSC-B due to the possible interworking between the ~~BSSM~~RANAP protocol carried on the E-interface and the ~~BSSM~~RANAP protocol used on the ~~A~~Iu-interface ~~. If the radio resource allocation is queued by RNS-B, the A-QUEUING-INDICATION may optionally be sent back to 3G_MSC-A. The further radio resources allocation result (IU-RELOC-REQUEST-ACK or IU-RELOC-FAILURE sent in MAP as A-HO-REQUEST-ACK or A-~~

~~HO-FAILURE) will be transferred to 3G_MSC-A using the MAP-PROCESS-ACCESS-SIGNALLING request.~~ If the radio resource allocation is not possible, the MAP-PREPARE-HANDOVER response containing an IU-RELOCATION-FAILURE ~~sent as A-HO-FAILURE~~ will be sent to 3G_MSC-A. 3G_MSC-B will do the same if a fault is detected on the identity of the RNS where the call has to be relocated. 3G_MSC-B simply reports the events related to the dialogue. It is up to 3G_MSC-A to decide the action to perform if it receives negative responses or the operation fails due to the expiry of the MAP-PREPARE-HANDOVER timer.

If an error related to the TCAP dialogue or to the MAP-PREPARE-HANDOVER request is returned from 3G_MSC-B, this will be indicated to 3G_MSC-A and 3G_MSC-A will terminate the relocation attempt. The existing connection to the UE shall not be cleared.

When the ~~A-HO~~IU-RELOC-REQUEST-ACKNOWLEDGE has been received, 3G_MSC-A shall establish a circuit between 3G_MSC-A and 3G_MSC-B by signalling procedures supported by the network. In figure 30 this is illustrated by the messages IAM (Initial Address Message) and ACM (Address Complete Message) of Signalling System no 7. 3G_MSC-B awaits the capturing of the UE (section 6.2.3) on the radio path when the ACM is sent and 3G_MSC-A initiates the relocation execution when ACM is received (illustrated by the IU-RELOC-COMMAND and described in the section 6.2.3).

3G_MSC-B transfers to 3G_MSC-A the acknowledgement received from the correct UE (IU-RELOC-DETECT/IU-RELOC-COMPLETE~~, sent as A-HO-DETECT/A-HO-COMPLETE~~). The IU-RELOC-DETECT, if received, is transferred to 3G_MSC-A ~~as A-HO-DETECT~~ using the MAP-PROCESS-ACCESS-SIGNALLING request. The IU-RELOC-COMPLETE, when received from the correct UE, is included in the MAP-SEND-END-SIGNAL request ~~as A-HO-COMPLETE~~ and sent back to 3G_MSC-A. The circuit is through connected in 3G_MSC-A when the ~~A-HO~~IU-RELOC-DETECT or the ~~A-HO~~IU-RELOC-COMPLETE is received from 3G_MSC-B. The old radio resources are released when the ~~A-HO~~IU-RELOC-COMPLETE message is received from 3G_MSC-B. The sending of the MAP-SEND-END-SIGNAL request starts the MAP supervision timer for the MAP dialogue between 3G_MSC-A and 3G_MSC-B. When the MAP-SEND-END-SIGNAL request including the ~~A-HO~~IU-RELOC-COMPLETE message is received in 3G_MSC-A, the resources in RNS-A shall be released.

In order not to conflict with the PSTN/ISDN signalling system(s) used between 3G_MSC-A and 3G_MSC-B, 3G_MSC-B must generate an answer signal when IU-RELOC-DETECT/COMPLETE is received.

3G_MSC-B shall release the Handover Number when the circuit between 3G_MSC-A and 3G_MSC-B has been established.

If the circuit between 3G_MSC-A and 3G_MSC-B cannot be established, (e.g. an unsuccessful backward message is received instead of ACM) 3G_MSC-A terminates the inter-3G_MSC relocation attempt by sending an appropriate MAP message, for example an ABORT.

3G_MSC-A shall retain overall call control until the call is cleared by the fixed subscriber or the UE and there is no further call control functions to be performed (e.g. servicing waiting calls, echo cancellers).

When 3G_MSC-A clears the call to the UE it also clears the call control functions in 3G_MSC-A and sends the MAP-SEND-END-SIGNAL response to release the MAP resources in 3G_MSC-B.

3G_MSC-A may terminate the procedure at any time by sending an appropriate MAP message to 3G_MSC-B. If establishment of the circuit between 3G_MSC-A and 3G_MSC-B has been initiated, the circuit must also be cleared.

The relocation will be aborted by 3G_MSC-A if it detects release or interruption of the radio path before the call has been established on 3G_MSC-B.

8.3.2 Basic relocation procedure not requiring the establishment of a circuit connection between 3G_MSC-A and 3G_MSC-B

The basic SRNS relocation procedures to be used when no circuit connection is required by 3G_MSC-A are similar to those described in section 8.3.1 for circuit switched calls. The main differences to the procedures described in section 8.3.1 relate to the establishment of circuits between the network entities and the Handover Number allocation.

In the case of basic relocation, 3G_MSC-A shall specify to 3G_MSC-B that no Handover Number is required in the MAP-PREPARE-HANDOVER request (see TS 29.002 [12]). As for the basic relocation using a circuit connection, the ~~A-HO~~IU-RELOC-REQUEST is transmitted at the same time together with the identity of the target RNS to which the call is to be relocated. Any subsequent Handover Number allocation procedure will not be invoked until the completion

of the basic relocation procedure (see section: Subsequent Channel Assignment using a circuit connection). 3G_MSC-B shall then perform the radio resources allocation as described in section 8.3.1 if applicable. The MAP-PREPARE-HANDOVER response shall be returned to 3G_MSC-A including either the response of the radio resources allocation request received from RNS-B (IU-RELOC-REQUEST-ACKNOWLEDGE/IU-RELOC-FAILURE ~~sent as A-HO-REQUEST-ACKNOWLEDGE/A-HO-FAILURE~~ with possible extra ~~BSSM~~RANAP information. Th~~is~~ese extra information ~~is~~are amended by 3G_MSC-B due to the possible interworking between the ~~BSSM~~RANAP protocol carried on the E-interface and the ~~BSSM~~RANAP protocol used on the ~~A~~Iu-interface) ~~or potentially the A-QUEUING-INDICATION~~. The basic relocation procedure will continue as described in section 8.3.1 except that no circuit connection will be established towards 3G_MSC-B.

The relevant case for the basic relocation without circuit connection is shown in figure 31. As can be seen the major differences to the equivalent figure 30 are the omission of any circuit establishment messaging and the omission of handover number allocation signalling.

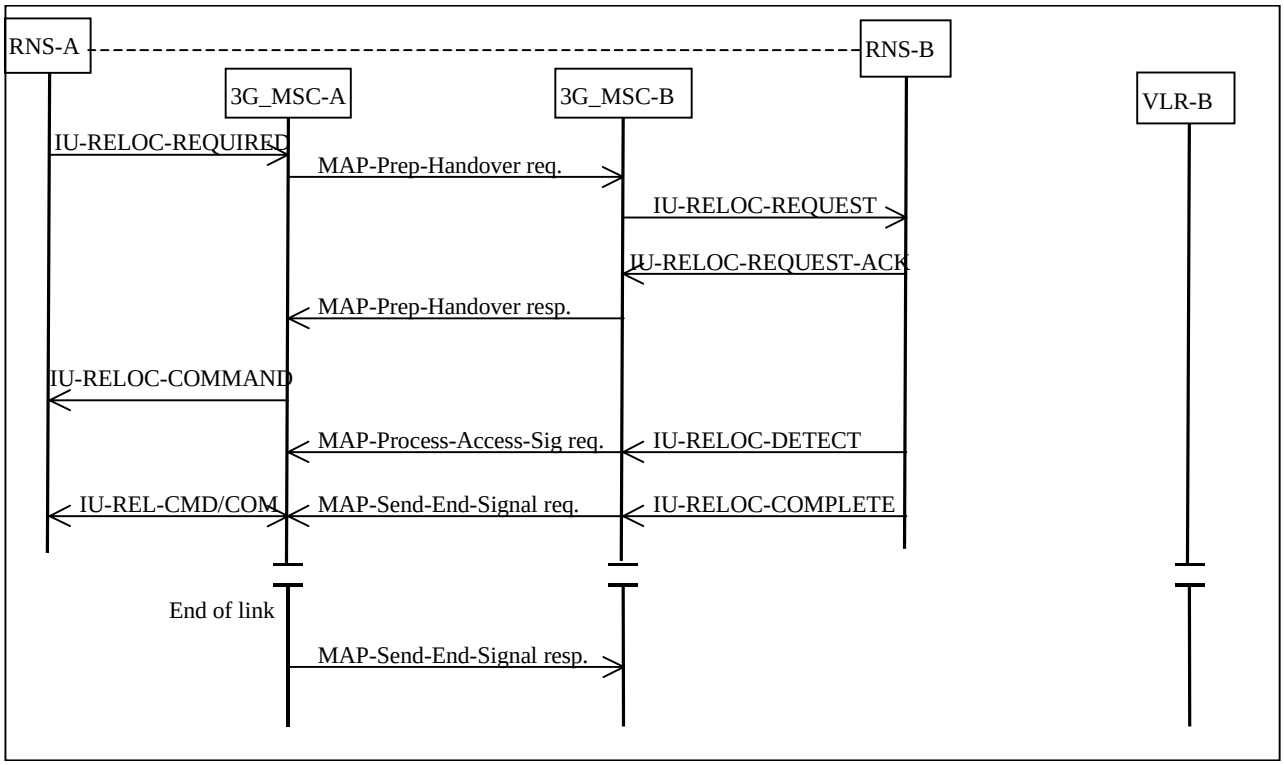

Figure 31: Basic SRNS relocation procedure without a circuit connection

8.3.3 Procedure for subsequent relocation requiring a circuit connection between 3G_MSC-A and 3G_MSC-B

After the call has been relocated from 3G_MSC-A to 3G_MSC-B, if the UE leaves the area of 3G_MSC-B during the same call, subsequent relocation is necessary in order to continue the connection when no Iur interface exists between the involved RNSs, or to optimise the transmission path when the Iur interface is used.

The following cases apply:

i) the UE moves back to the area of 3G_MSC-A;

ii) the UE moves into the area of a third 3G_MSC (3G_MSC-B').

In both cases the call is switched in 3G_MSC-A; the circuit between 3G_MSC-A and 3G_MSC-B shall be released after a successful subsequent relocation has been performed.

8.3.3.1 Description of subsequent relocation procedure i): 3G_MSC-B to 3G_MSC-A

The procedure for successful relocation from 3G_MSC-B back to 3G_MSC-A is shown in figure 32.

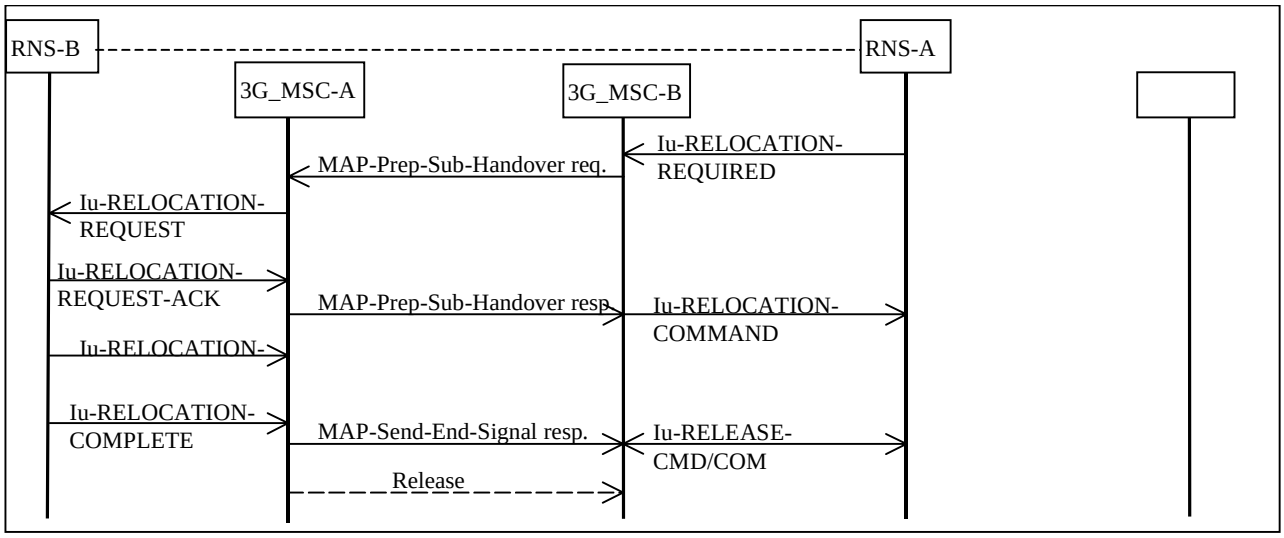

Figure 32: Subsequent relocation procedure i) successful relocation from 3G_MSC-B to 3G_MSC-A using a circuit connection

The procedure is as follows:

3G_MSC-B sends the MAP-PREPARE-SUBSEQUENT-HANDOVER request to 3G_MSC-A indicating the new 3G_MSC number (3G_MSC-A number), indicating also the identity of the ~~cell~~ target RNS ~~(*the cell id in the MAP message is FFS*)~~ where the call has to be relocated and including a complete ~~A-HO~~IU-RELOC-REQUEST message. (NOTE: 3G_MSC-B shall not send further MAP-PREPARE-SUBSEQUENT-HANDOVER requests while a relocation attempt is pending or before any timeouts). Since 3G_MSC-A is the call controlling 3G_MSC, this 3G_MSC needs no Handover Number for routing purposes; 3G_MSC-A can immediately initiate the relocation towards the target RNS.

When relocation can be initiated, 3G_MSC-A shall return in the MAP-PREPARE-SUBSEQUENT-HANDOVER response the complete IU-RELOC-REQUEST-ACKNOWLEDGE message received from the RNS-B ~~as A-HO-REQUEST-ACKNOWLEDGE~~ and possible extra ~~BSSM~~RANAP information, amended by 3G_MSC-A due to the possible interworking between the ~~BSSM~~RANAP protocol carried on the E-interface and the ~~BSSM~~RANAP protocol used on the ~~A~~Iu-interface. ~~If the radio resource allocation is queued by RNS-B, the A-QUEUING-INDICATION may optionally be sent back to 3G_MSC-B. The further radio resource allocation result (IU-RELOC-REQUEST-ACK or IU-RELOC-FAILURE, sent as A-HO-REQUEST-ACK or A-HO-FAILURE) will be transferred to 3G_MSC-B using the MAP-FORWARD-ACCESS-SIGNALLING request.~~ If a radio resource cannot be assigned or if a fault is detected on the target RNS identity, or the target RNS identity in the ~~A-HO~~IU-RELOC-REQUEST is not consistent with the target 3G_MSC number, the MAP-PREPARE-SUBSEQUENT-HANDOVER response containing an ~~A-HO~~IU-RELOC-FAILURE message shall be given to 3G_MSC-B, in addition 3G_MSC-B shall maintain the connection with the UE.

If the procedure in 3G_MSC-A is successful then 3G_MSC-B can request the UE to retune to the new RNS-B on 3G_MSC-A in the case of relocation without Iur interface, or request RNS-B to become serving RNS in the case of relocation with Iur interface. This is illustrated in figure 32 by the IU-RELOC-COMMAND message. The operation is successfully completed when 3G_MSC-A receives the IU-RELOC-COMPLETE message.

After relocation 3G_MSC-A shall release the circuit to 3G_MSC-B.

3G_MSC-A must also terminate the MAP procedure for the basic relocation between 3G_MSC-A and 3G_MSC-B by sending an appropriate MAP message. 3G_MSC-B will release the resources in RNS-A when the MAP-SEND-END-SIGNAL response is received.

8.3.3.2 Description of subsequent relocation procedure ii): 3G_MSC-B to 3G_MSC-B'

The procedure for successful relocation from 3G_MSC-B to 3G_MSC-B' is shown in figure 33.

The procedure consists of two parts:

- a subsequent relocation from 3G_MSC-B back to 3G_MSC-A as described in section 8.3.3.1; and
- a basic relocation~~handover~~ from 3G_MSC-A to 3G_MSC-B' as described in section 8.3.1.

3G_MSC-B sends the MAP-PREPARE-SUBSEQUENT-HANDOVER request to 3G_MSC-A indicating a new 3G_MSC number (which is the identity of 3G_MSC-B'), indicating also the target RNS~~cell~~ identity ~~*(the cell id in the MAP message is FFS)*~~ and including a complete ~~A-HO~~IU-RELOC-REQUEST, 3G_MSC-A then starts a basic relocation procedure towards 3G_MSC-B'.

When 3G_MSC-A receives the ACM from 3G_MSC-B', 3G_MSC-A informs 3G_MSC-B that 3G_MSC-B' has successfully allocated the radio resources on RNS-B' side by sending the MAP-PREPARE-SUBSEQUENT-HANDOVER response containing the complete IU-RELOC-REQUEST-ACKNOWLEDGE received from RNS-B' ~~as A-HO-REQUEST-ACKNOWLEDGE~~ and possible extra ~~BSSM~~RANAP information, amended by 3G_MSC-A due to the possible interworking between the ~~BSSM~~RANAP protocol carried on the E-interface between 3G_MSC-A and 3G_MSC-B' and the ~~BSSM~~RANAP protocol carried on the E-interface between 3G_MSC-A and 3G_MSC-B. Now 3G_MSC-B can start the procedure on the radio path if needed.

For 3G_MSC-A the relocation is completed when it has received the MAP-SEND-END-SIGNAL REQUEST from 3G_MSC-B'containing the IU-RELOC-COMPLETE received from the RNS-B' ~~as A-HO-COMPLETE~~. The circuit between 3G_MSC-A and 3G_MSC-B is released. 3G_MSC-A also sends the MAP-SEND-END-SIGNAL response to 3G_MSC-B in order to terminate the original MAP dialogue between 3G_MSC-A and 3G_MSC-B. 3G_MSC-B releases the radio resources when it receives this message.

~~If the radio resource allocation is queued by the RNS-B', the A-QUEUING-INDICATION may optionally be sent back to 3G_MSC-B.~~ If no radio resource can be allocated by 3G_MSC-B' or no circuit between 3G_MSC-A and 3G_MSC-B' can be established or a fault is detected on the target RNS identity or the target RNS identity in the ~~A-HO~~IU-RELOC-REQUEST is not consistent with the target 3G_MSC number, 3G_MSC-A informs 3G_MSC-B by using the ~~A-HO~~IU-RELOC-FAILURE message included in the MAP-PREPARE-SUBSEQUENT-HANDOVER response. 3G_MSC-B shall maintain the existing connection with the UE.

When the subsequent relocation is completed, 3G_MSC-B' is considered as 3G_MSC-B. Any further inter-3G_MSC relocation is handled as described above for a subsequent relocation.

Next Change

11.3 Handover/Relocation control procedures 3G_MSC-A (functional unit 3)

The procedures of functional unit 3 are given in terms of SDL diagrams in figure 43. To easily distinguish the interface concerned the messages received or sent from this unit are prefixed with either 'MAP' for a MAP message, 'A' for an A-Interface message, 'I' for an ISDN/PSTN message or ‘Iu’ for an Iu-message.

The procedures of functional unit 3 include:

i) Initiation. The initiation condition is shown by the signal Iu-RELOCATION-REQUIRED or A-HANDOVER-REQUIRED.

The diagram also includes queuing when there is no channel available. Calls for which handover/relocation has been initiated should be queued with priority higher than normal calls. They should have lower priority than emergency calls.

ii) handover/relocation of calls within the area of 3G_MSC-A, i.e. handover/relocation case i).

In the handover/relocation from RNS-A/BSS-A to RNS-B/BSS-B 3G_MSC-A controls the procedures on both the previous and the new radio channel, using signals Iu-RELOCATION-REQUEST/A-HANDOVER-

REQUEST and Iu-RELOCATION-COMMAND/A-HANDOVER-COMMAND. The handover/relocation procedure is completed when Iu-RELOCATION-COMPLETE/A-HANDOVER-COMPLETE is received. If this signal is not received, the radio path and the connection on interface B' are either released or the original connection is maintained.

For handover/relocation devices with three-party capabilities the device is first set up so that all interfaces Iu'/A', Iu"/A" and B' are connected (illustrated by the signal 'set up handover device'). This is done when the Relocation Command is sent to serving RNS or Handover Command is sent to the serving BSS. The device is connected in its final position (i.e. Iu''/ A" to B' for case ii)) (illustrated by the signal 'connect handover device') when Iu-RELOCATION-COMPLETE/A-HANDOVER-COMPLETE is received.

iii) relocation to 3G_MSC-B. This procedure is the one described in sections 8.3.1 and 8.3.2. For handover/relocation devices with three-party capabilities the device is set-up when 3G_MSC-A sends the Relocation Command to the UE, i.e. the interfaces Iu', B' and B" are then connected. The device is connected in its final position (i.e. B' to B") when the successful procedure indication is received from functional unit 4.

iv) UMTS to GSM handover to MSC-B. This procedure is the one described in sections 8.1.1 and 8.1.2. For handover/relocation devices with three-party capabilities the device is set-up when 3G_MSC-A sends the Relocation Command to the serving RNS, i.e. the interfaces Iu', B' and B" are then connected. The device is connected in its final position (i.e. B' to B") when the successful procedure indication is received from functional unit 4.

v) GSM to UMTS handover to 3G_MSC-B. This procedure is the one described in sections 8.2.1 and 8.2.2. For handover/relocation devices with three-party capabilities the device is set-up when MSC-A sends the Handover Command to the serving BSS , i.e. the interfaces A', B' and B" are then connected. The device is connected in its final position (i.e. B' to B") when the successful procedure indication is received from functional unit 4.

vi) subsequent relocation from 3G_MSC-B to 3G_MSC-A. The procedure is described in sections 8.3.3.1 and 8.3.4.1. When a relocation to 3G_MSC-A indication is received from functional unit 4, the handover/relocation device is set up so that interfaces B', B" and Iu' are connected (for devices with three-party capabilities). When Iu-RELOCATION-COMPLETE is received, the device is connected in its final position (i.e. B' to Iu').

If Iu-RELOCATION-COMPLETE is not received (expiry of timer T704), the handover/relocation device releases interface Iu' and returns to a position where B' and B" are connected.

vii) subsequent GSM to UMTS handover from MSC-B to 3G_MSC-A. The procedure is described in sections 8.2.3.1 and 8.2.4.1. When a handover to 3G_MSC-A indication is received from functional unit 4, the handover device is set up so that interfaces B', B" and A' are connected (for handover devices with three-party capabilities). When A-RELOCATION-COMPLETE is received, the device is connected in its final position (i.e. B' to Iu').

If A-RELOCATION-COMPLETE is not received (expiry of timer T504), the device releases interface Iu' and returns to a position where B' and B" are connected.

viii) subsequent UMTS to GSM handover from 3G_MSC-B to MSC-A. The procedure is described in sections 8.1.3.1 and 8.1.4.1. When a handover to MSC-A indication is received from functional unit 4, the handover device is set up so that interfaces B', B" and Iu' are connected (for handover devices with three-party capabilities). When A-HANDOVER-COMPLETE is received, the device is connected in its final position (i.e. B' to A').

If A-HANDOVER-COMPLETE is not received (expiry of timer T304), the device releases interface A' and returns to a position where B' and B" are connected.

ix) subsequent relocation from 3G_MSC-B to a third 3G_MSC (3G_MSC-B'). The procedure is described in sections 8.3.4.2 and 8.3.5.2. The handover/relocation device is set up in its initial position, (i.e. interconnection of interfaces B', B" and B"') when the connection to 3G_MSC-B' has been established. 3G_MSC-B is informed via functional unit 4 that the connection has been established and that the procedure on the radio path can be initiated. The device is connected in its final position (i.e. B' to B"') when a successful procedure indication is received from functional unit 4. 3G_MSC-B is informed that all procedures in 3G_MSC-B can be terminated (illustrated by the MAP-SEND-END-SIGNAL response). The device returns to the state where B' and B" are connected if the subsequent relocation procedure fails.

x) subsequent UMTS to GSM handover from 3G_MSC-B to a third MSC (MSC-B'). The procedure is described in sections 8.1.3.2 and 8.1.4.2. The handover/relocation device is set up in its initial position, (i.e. interconnection

of interfaces B', B" and B"') when the connection to MSC-B' has been established. 3G_MSC-B is informed via functional unit 4 that the connection has been established and that the procedure on the radio path can be initiated. The device is connected in its final position (i.e. B' to B"') when a successful procedure indication is received from functional unit 4. 3G_MSC-B is informed that all procedures in 3G_MSC-B can be terminated (illustrated by the MAP-SEND-END-SIGNAL response). The device returns to the state where B' and B" are connected if the subsequent UMTS to GSM handover procedure fails.

xi) subsequent GSM to UMTS handover from MSC-B to a third MSC (3G_MSC-B'). The procedure is described in sections 8.2.3.2 and 8.2.4.2. The handover/relocation device is set up in its initial position, (i.e. interconnection of interfaces B', B" and B"') when the connection to 3G_MSC-B' has been established. MSC-B is informed via functional unit 4 that the connection has been established and that the procedure on the radio path can be initiated. The device is connected in its final position (i.e. B' to B"') when a successful procedure indication is received from functional unit 4. MSC-B is informed that all procedures in MSC-B can be terminated (illustrated by the MAP-SEND-END-SIGNAL response). The device returns to the state where B' and B" are connected if the subsequent GSM to UMTS handover procedure fails.

Timers in 3G_MSC-A.

The procedures are supervised by timers in order to avoid a deadlock when responses are not received or the procedures fail.

The following timers are defined for SRNS Relocation:

T701: this timer supervises the queuing time for a free channel for the relocation inside UMTS. If T701 expires, a no channel indication is generated and 3G_MSC-A will terminate the relocation as described in section 6.2.3. T701 is set by O&M.

T702: this timer supervises the time for relocation completion for relocation between RNSs in 3G_MSC-A. T702 is set by O&M.

T703: this timer supervises the time between issuing an Iu-RELOCATION-COMMAND from 3G_MSC-A and receiving a successful procedure indication from 3G_MSC-B. This timer also supervises the time between sending an ~~A HANDOVER~~IU-RELOCATION-REQUEST-ACKNOWLEDGE to 3G_MSC-B and receiving a successful procedure indication from 3G_MSC-B'. If T703 expires, the relocation procedure is terminated. T703 is set by O&M.

T704: this timer supervises the time between sending of an ~~A HANDOVER~~IU-RELOCATION-REQUEST-ACKNOWLEDGE to 3G_MSC-B and receiving the Iu-RELOCATION-COMPLETE from RNS-B on 3G_MSC-A. If the timer expires, the new radio channel is released and the existing handover/relocation device connection to 3G_MSC-B is maintained. T704 is set by O&M.

The following timers are defined for UMTS to GSM handover:

T301: this timer supervises the queuing time for a free channel for the UMTS to GSM handover. If T301 expires, a no channel indication is generated and 3G_MSC-A will terminate the handover as described in section 6.2.3. T301 is set by O&M.

T302: this timer supervises the time for UMTS to GSM handover completion for handover from RNS to BSS in 3G_MSC-A. T302 is set by O&M.

T303: this timer supervises the time between issuing an Iu-RELOCATION-COMMAND from 3G_MSC-A and receiving a successful procedure indication from MSC-B. This timer also supervises the time between sending an A-HO-REQUEST-ACKNOWLEDGE to MSC-B and receiving a successful procedure indication from MSC-B'. If T303 expires, the UMTS to GSM handover procedure is terminated. T303 is set by O&M.

T304: this timer supervises the time between sending of an A-HO-REQUEST-ACKNOWLEDGE to MSC-B and receiving the A-HANDOVER-COMPLETE from BSS-B on 3G_MSC-A. If the timer expires, the new radio channel is released and the existing handover device connection to MSC-B is maintained. T304 is set by O&M.

The following timers are defined for GSM to UMTS handover:

T501: this timer supervises the queuing time for a free channel for the GSM to UMTS handover. If T501 expires, a no channel indication is generated and 3G_MSC-A will terminate the handover as described in section 6.2.3. T501 is set by O&M.

T502: this timer supervises the time for GSM to UMTS handover completion for handover from BSS to RNS in 3G_MSC-A. T502 is set by O&M.

T503: this timer supervises the time between issuing an A-HANDOVER-COMMAND from MSC-A and receiving a successful procedure indication from 3G_MSC-B. This timer also supervises the time between sending an A-HANDOVER-REQUEST-ACKNOWLEDGE to 3G_MSC-B and receiving a successful procedure indication from 3G_MSC-B'. If T503 expires, the GSM to UMTS handover procedure is terminated. T503 is set by O&M.

T504: this timer supervises the time between sending of an A-HANDOVER-REQUEST-ACKNOWLEDGE to 3G_MSC-B and receiving the Iu-RELOCATION-COMPLETE from RNS-B on 3G_MSC-A. If the timer expires, the new radio channel is released and the existing handover device connection to MSC-B is maintained. T504 is set by O&M.

Next Change

11.7 Protocol interworking

If the 3G_MSC-A initiates ~~accepts~~ an Inter-~~3G~~ MSC UMTS to GSM handover~~/relocation~~ procedure according to ~~Phase 2~~ MAP and BSSMAP protocols while using a RANAP protocol towards RNS-A, 3G_MSC-A has to perform the protocol interworking.

The same holds if 3G_MSC-A accepts ~~initiates~~ a subsequent GSM to UMTS handover~~/relocation~~ while using a RANAP protocol towards RNS-B.

Next Change

12.3 Handover/Relocation control procedures in 3G_MSC-B (functional unit 3)

The procedures of functional unit 3 are given in form of SDL diagrams in figure 44. To easily distinguish the interface concerned the messages received or sent from this unit are prefixed with either 'MAP' for a MAP message, 'A' for an A-Interface message, ‘Iu’ for an Iu-Interface message or 'I' for an ISDN/PSTN message. The procedure in functional unit 3 include:

i) Inter 3G_MSC handover/relocation from 3G_MSC-A.

This case is initiated by 3G_MSC-A, and includes allocation and establishment of the new radio resources. The procedure is outlined in sections 8.1.1 and 8.1.2. for UMTS to GSM handover, sections 8.2.1 and 8.2.2 for GSM to UMTS handover and sections 8.3.1 and 8.3.2 for relocation.

ii) Intra-3G_MSC UMTS to GSM handovers within the area controlled by 3G_MSC-B.

This procedure is the same as that of ii) in section 11.3, except that the Iu-RELOCATION-REQUI~~R~~ED is received by 3G_MSC-B.

iii) Intra-3G_MSC GSM to UMTS handovers within the area controlled by 3G_MSC-B.

This procedure is the same as that of ii) in section 11.3, except that the A-HANDOVER-REQUI~~R~~ED is received by 3G_MSC-B.

iv) Intra-3G_MSC SRNS Relocation within the area controlled by 3G_MSC-B.

This procedure is the same as that of ii) in section 11.3, except that the Iu-RELOCATION-REQUI~~R~~ED is received by 3G_MSC-B.

v) subsequent handover/relocation to another 3G_MSC (3G_MSC-A or 3G_MSC-B').

The initiation procedure is essentially the same as that of i) of section 11.3. The Handover Command to the BSS or the Relocation Command to the RNS is now generated by 3G_MSC-B after the A-HO-REQUEST-ACKNOWLEDGE or Iu-RELOCATION-REQUEST-ACKNOWLEDGE is received from 3G_MSC-A (via functional unit 4). The procedure is terminated in 3G_MSC-B when 3G_MSC-B receives a terminate procedure indication from functional unit 4.

Timers in 3G_MSC-B

The following procedures are supervised by timers in order to avoid a deadlock when responses are not received or the procedures fail.

The following timers are defined for UMTS to GSM handover:

T401: this timer supervises the queuing time for a free channel. T401 is set by O&M.

T402: this timer supervises the time for handover completion for UMTS to GSM handover from RNS to BSS in 3G_MSC-B. If T402 expires, the radio path and the connection on interface B' are released. T402 is set by O&M.

T404: this timer supervises the time between sending of address complete message to 3G_MSC-A and receiving the A-HANDOVER-COMPLETE from BSS-B on 3G_MSC-B. This timer also supervises the time between issuing the handover command to the UE/MS and receiving the MAP-SEND-END-SIGNAL response from 3G_MSC-A, for a subsequent handover from UMTS to GSM. In the case of a UMTS to GSM handover without circuit connection between 3G_MSC-A and 3G_MSC-B this timer supervises the time between issuing the A-HO-REQUEST-ACKNOWLEDGE to the 3G_MSC-A and receiving the A-HANDOVER-COMPLETE from BSS-B on 3G_MSC-B. If the timer expires, then any new radio channel is released. T404 is set by O&M.

T410: this timer is used to supervise the time for establishing a circuit connection from 3G_MSC-A to 3G_MSC-B. When T410 expires, the allocated channel in 3G_MSC-B is released. T410 is set by O&M. This timer is not started when 3G_MSC-A explicitly indicates that no handover number is needed.

T411: this timer is used to control the time between requesting a subsequent UMTS to GSM handover (A-HO-REQUEST to the 3G_MSC-A) and receiving the response from 3G_MSC-A (A-HO-REQUEST-ACKNOWLEDGE/A-HO-FAILURE). If T411 expires, the existing connection with the UE/MS is maintained. T411 is set by O&M.

The following timers are defined for GSM to UMTS handover

T601: this timer supervises the queuing time for a free radio resource. T601 is set by O&M.

T602: this timer supervises the time for handover completion for GSM to UMTS handover from BSS to RNS in 3G_MSC-B. If T602 expires, the radio path and the connection on interface B' are released. T602 is set by O&M.

T604: this timer supervises the time between sending of address complete message to 3G_MSC-A and receiving the Iu-RELOCATION-COMPLETE from RNS-B on 3G_MSC-B. This timer also supervises the time between issuing the handover command to the UE/MS and receiving the MAP-SEND-END-SIGNAL response from 3G_MSC-A, for a subsequent handover from GSM to UMTS. In the case of a GSM to UMTS handover without circuit connection between 3G_MSC-A and 3G_MSC-B this timer supervises the time between issuing the A-HO-REQUEST-ACKNOWLEDGE to the 3G_MSC-A and receiving the Iu-RELOCATION-COMPLETE from RNS-B on 3G_MSC-B. If the timer expires, then any new radio resource is released. T604 is set by O&M.

T610: this timer is used to supervise the time for establishing a circuit connection from 3G_MSC-A to 3G_MSC-B. When T610 expires, the allocated radio resource in 3G_MSC-B is released. T610 is set by O&M. This timer is not started when 3G_MSC-A explicitly indicates that no handover number is needed.

T611: this timer is used to control the time between requesting a subsequent GSM to UMTS handover (A-HO-REQUEST to the 3G_MSC-A) and receiving the response from 3G_MSC-A (A-HO-REQUEST-ACKNOWLEDGE/A-HO-FAILURE). If T611 expires, the existing connection with the UE/MS is maintained. T611 is set by O&M.

The following timers are defined for SRNS Relocation

T801: this timer supervises the queuing time for a free radio resource. T801 is set by O&M.

T802: this timer supervises the time for relocation completion for relocation between RNSs in 3G_MSC-B. If T802 expires, the radio path and the connection on interface B' are released. T802 is set by O&M.

T804: this timer supervises the time between sending of address complete message to 3G_MSC-A and receiving the Iu-RELOCATION-COMPLETE from RNS-B on 3G_MSC-B. This timer also supervises the time between issuing the handover command to the UE and receiving the MAP-SEND-END-SIGNAL response from 3G_MSC-A, for a subsequent relocation. In the case of a relocation without circuit connection between 3G_MSC-A and 3G_MSC-B this timer supervises the time between issuing the ~~A HO~~Iu-RELOCATION-REQUEST-ACKNOWLEDGE to the 3G_MSC-A and receiving the Iu-RELOCATION-COMPLETE from RNS-B on 3G_MSC-B. If the timer expires, then any new radio resource is released. T804 is set by O&M.

T810: this timer is used to supervise the time for establishing a circuit connection from 3G_MSC-A to 3G_MSC-B. When T810 expires, the allocated channel in 3G_MSC-B is released. T810 is set by O&M. This timer is not started when 3G_MSC-A explicitly indicates that no handover number is needed.

T811: this timer is used to control the time between requesting a subsequent relocation (~~A HO~~Iu-RELOCATION-REQUEST to the 3G_MSC-A) and receiving the response from 3G_MSC-A (~~A HO~~Iu-RELOCATION-REQUEST-ACKNOWLEDGE/~~A HO~~Iu-RELOCATION-FAILURE). If T811 expires, the existing connection with the UE is maintained. T811 is set by O&M.

Next Change

12.7 Protocol interworking

If the 3G_MSC-B accepts an Inter-3G_MSC GSM to UMTS handover~~/relocation~~ procedure according to ~~Phase 2~~ MAP and BSSMAP protocols while using a RANAP protocol towards RNS-B, 3G_MSC-B has to perform the protocol interworking.

The same holds if 3G_MSC-B initiates a subsequent UMTS to GSM handover~~/relocation~~ while using a RANAP protocol towards RNS-A.

Next Change

13.4 SRNS Relocation

If a circuit connection has to be set up (for example for a Mobile Originated or Mobile Terminated Call Establishment) after an Inter-3G_MSC relocation without circuit connection, 3G_MSC-A shall request a Handover Number using a MAP-PREPARE-HANDOVER request, containing the IU-RAB-ASSIGNMENT-REQUEST ~~as A-ASSIGNMENT-REQUEST~~, on the established MAP connection. If 3G_MSC-B indicates to 3G_MSC-B and to 3G_MSC-A that at least one of two procedures (RAB) assignment or Handover Number allocation can not be completed, then 3G_MSC-A shall terminate the circuit establishment attempt. The existing connection to the UE shall be maintained, if possible.

Last Change

15 SDL diagrams

NOTE: The message primitive names used in the SDL diagrams and message flows in this technical specification do not represent the actual messages specified in the GSM or 3GPP stage 3 technical specifications. The primitive names are only intended to be indicative of their use in this document.

SDL Annotation:

The following conventions and abbreviations have been used in the SDLs. Text included in '[]' is used to indicate either, the BSSMAP message (as defined in GSM 09.08 [7]) included in the message, or the transport of a Handover Number.

When traversing the following SDLs it may be possible that resources appear to be released repeatedly, however these operations are only executed once on their first occurrence. Furthermore it maybe that certain messages cannot, in practice, be received in particular states, after specific events have taken place. In general both of the above cases are obvious. This approach has been adopted (in line with other GSM Technical Specifications) in order to reduce the complexity of the SDLs and improve clarity, without reducing the quality of the functional description.

The following abbreviations have been used in the SDLs:

A-HO-REQUEST	A-HANDOVER-REQUEST
A-HO-REQUEST-ACK	A-HANDOVER-REQUEST-ACK.
A-HO-COMPLETE	A-HANDOVER-COMPLETE
A-HO-DETECT	A-HANDOVER-DETECT
A-HO-PERFORMED	A-HANDOVER-PERFORMED
A-ASG-REQUEST	A-ASSIGNMENT-REQUEST
A-ASG-COMPLETE	A-ASSIGNMENT-COMPLETE
A-ASG-FAILURE	A-ASSIGNMENT-FAILURE
MAP-PAS req	MAP-PROCESS-ACCESS-SIGNALLING req.
MAP-FAS req	MAP-FORWARD-ACCESS-SIGNALLING req.
IU-RLC-REQUEST	IU-RELOCATION-REQUEST
IU-RLC-REQUEST-ACK	IU-RELOCATION-REQUEST-ACK
IU-RLC-COMPLETE	IU-RELOCATION-COMPLETE
IU-RLC-DETECT	IU-RELOCATION-DETECT
IU-IREL-REQUEST	IU-IU-RELEASE-REQUEST
IU-RREL-REQUEST	IU-RAB-RELEASE-REQUEST
IU-RASG-REQUEST	IU-RAB-ASSIGNMENT-REQUEST
IU-RASG-RESPONSE	IU-RAB-ASSIGNMENT-RESPONSE

NOTE : The SDL diagrams have been checked for consistency with the allocation of the A interface circuits by the BSC. The conclusion was that SDLs are expressed in general terms, and offer a sufficient latitude of interpretation to be consistent with the allocation of A interface circuits by the BSC.

3GPP TSG-CN 1 meeting #11
Umeå, Sweden, 28 Feb - 3 Mar 2000

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

For submission to:	TSG-N #7	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		Core Network	X

Source: CN1 **Date:** 2000-02-25

Subject: Clarifications of 3G_MSC-A and 3G_MSC-B roles

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:
1. The text “handover/relocation” has been replaced by the text “relocation” in some places.
2. The RNS-A is source and the message is then Relocation Cancel and not Relocation Failure
3. Clarification added in what direction an inter-system handover is done.
4. Addition of GSM to UMTS handover in 3G_MSC-A and 3G_MSC-B (this was considered as necessary after the clarification of the direction in 3. was included)

Clauses affected: 4.3.1, 4.3.2, 4.4.1, 4.4.2

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:

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4.3.1 Role of 3G_MSC-A

In the Intra-3G_MSC handover/relocation case, the 3G_MSC-A (simply termed 3G_MSC) controls the call, the mobility management and the radio resources before, during and after an Intra-3G_MSC handover/relocation. When RANAP or BSSMAP procedures have to be performed, they are initiated and driven by 3G_MSC-A.

In the Inter-3G_MSC ~~handover/~~relocation case, 3G_MSC-A is the 3G_MSC that controls the call and the mobility management of the UE~~/MS~~ during the call, before, during and after a basic or subsequent ~~handover/~~relocation. When RANAP procedures related to dedicated resources have to be performed towards the UE~~/MS~~, they are initiated and driven by 3G_MSC-A. The 3G_MSC-A - 3G_MSC-B interface works as a 3G_MSC - BSS interface for the RANAP procedures, sent as BSSMAP procedures. The Direct Transfer signalling is relayed transparently by 3G_MSC-B between 3G_MSC-A and the UE~~/MS~~.

During a basic ~~handover/~~relocation, 3G_MSC-A initiates and controls all the ~~handover/~~relocation procedure, from its initiation (reception of Relocation Required from RNS-A on Iu-interface) until its completion (reception of Relocation Complete from 3G_MSC-B on E-interface).

During a subsequent ~~handover/~~relocation back to 3G_MSC-A, 3G_MSC-A acts as an RNS towards 3G_MSC-B, which controls the ~~handover/~~relocation procedure until the termination in 3G_MSC-A of the handover radio resources allocation (sending of the Relocation Request Acknowledge to 3G_MSC-B from 3G_MSC-A). Then all ~~handover/~~relocation related messages shall terminate at 3G_MSC-A (e.g. Relocation Detect/Complete from RNS-B, Relocation ~~Failure~~ Cancel from RNS-A).

During a subsequent ~~handover/~~relocation to a third 3G_MSC, 3G_MSC-A works towards 3G_MSC-B' as described above in the basic ~~handover/~~relocation paragraph and towards 3G_MSC-B as described above in subsequent ~~handover/~~relocation paragraph.

In the Inter-System, inter-3G_MSC handover case, 3G_MSC-A is the 3G_MSC which controls the call and the mobility management of the UE/MS during the call, before, during and after a basic or subsequent inter-system handover. When BSSAP procedures related to dedicated resources have to be performed towards the UE/MS, they are initiated and driven by 3G_MSC-A. The 3G_MSC-A – MSC-B interface works as a 3G_MSC – BSS interface for a subset of BSSMAP procedures. These BSSMAP procedures described in GSM 09.~~-~~08 are those related to dedicated resources. The DTAP signalling is relayed transparently by MSC-B between 3G_MSC-A and the UE/MS.

During a basic inter-system UMTS to GSM handover, 3G_MSC-A initiates and controls all the handover procedure, from its initiation (reception of Relocation Required from RNS-A on Iu-interface) until its completion (reception of Handover Complete from MSC-B on E-interface).

During a subsequent inter-system UMTS to GSM handover back to 3G_MSC-A, 3G_MSC-A acts as a BSS towards 3G_MSC-B, which controls the handover procedure until the termination in 3G_MSC-A of the handover radio resources allocation (sending of the Handover Request Acknowledge to 3G_MSC-B from 3G_MSC-A). Then all handover related messages shall terminate at 3G_MSC-A (e.g. Handover Detect/Complete from BSS-B, Relocation ~~Failure~~ Cancel from RNS-A).

During a subsequent inter-system UMTS to GSM handover to a third 3G_MSC, 3G_MSC-A works towards MSC-B' as described above in the basic inter-system handover paragraph and towards 3G_MSC-B as described above in subsequent inter-system handover paragraph.

During a basic inter-system GSM to UMTS handover, 3G_MSC-A initiates and controls all the handover procedure, from its initiation (reception of Handover Required from BSS-A on A-interface) until its completion (reception of Handover Complete from 3G_MSC-B on E-interface).

During a subsequent inter-system GSM to UMTS handover back to 3G_MSC-A, 3G_MSC-A acts as an RNS towards MSC-B, which controls the handover procedure until the termination in 3G_MSC-A of the handover radio resources allocation (sending of the Handover Request Acknowledge to MSC-B from 3G_MSC-A). Then all handover related messages shall terminate at 3G_MSC-A (e.g. Relocation Detect/Complete from RNS-B, Handover Failure from BSS-A).

During a subsequent inter-system GSM to UMTS handover to a third 3G_MSC, 3G_MSC-A works towards 3G_MSC-B' as described above in the basic inter-system handover paragraph and towards MSC-B as described above in subsequent inter-system handover paragraph.

Next Change

4.3.2 Functional composition of 3G_MSC-A and its interfaces for handover/relocation

In order to simplify the description of the handover/relocation procedures the controlling 3G_MSC (3G_MSC-A) can be considered to be composed of five functional units, as shown in figure 4.

Signalling functions

1) RNC/BSC/3G_MSC (UE/MS/RNC/BSC) Procedures 3G_MSC-A. This unit is used to control the signalling between the 3G_MSC, RNC or BSC and UE/MS. Interface Iu' is the connection to the old RNC and interface Iu" is the connection to the new RNC, when an Intra-3G_MSC ~~handover~~ relocation takes place. Interface Iu' is the connection to the old RNC and interface A" is the connection to the new BSC, when an Intra-3G_MSC UMTS to GSM handover takes place. Interface A' is the connection to the old BSC and interface Iu" is the connection to the new RNC, when an Intra-3G_MSC GSM to UMTS handover takes place. Interface x represents the interworking connection to the Handover/Relocation Control Procedures 3G_MSC-A.

2) Call Control Procedures 3G_MSC-A. This unit is used to control the call. Interface B' is used for normal call control procedures. When a Basic ~~handover/~~relocation from 3G_MSC-A to 3G_MSC-B is to be performed then interface B" is employed to provide a signalling and call control connection to 3G_MSC-B. If a Subsequent handover/relocation to 3G_MSC-B' is to be performed then interface B"' is used. Similarly, when a Basic inter-system handover from 3G_MSC-A to 3G_MSC-B is to be performed, then interface B" is employed to provide a signalling and call control connection to 3G_MSC-B. If a Subsequent inter-system handover to 3G_MSC-B' is to be performed then interface B"' is used.

3) Handover/Relocation Control Procedures 3G_MSC-A. This unit provides both the overall control of the handover/relocation procedure and interworking between the internal interfaces (x, y and z).

4) MAP Procedures 3G_MSC-A. This unit is responsible for controlling the exchange of MAP messages between 3G_MSCs during an Inter-3G_MSC handover/relocation, or between 3G_MSC-A and MSC-B during an Inter-system Inter-3G_MSC handover. This unit communicates with the Handover/Relocation Control Procedures 3G_MSC-A via interface z.

Switching functions

5) Switch and Handover/Relocation Device 3G_MSC-A. For all calls this unit is responsible for connecting the new path into the network via interface B'. In specific cases it may be unnecessary to take any explicit action in the 3G_MSC concerning the handover/relocation device. The handover/relocation device interconnections are illustrated in figure 5.

For UE/MS to UE/MS calls in the same 3G_MSC the configuration in Figure 5b) applies. In this case interface B" is internal to 3G_MSC-A and does not connect to another 3G_MSC.

The handover/relocation device can be either a three-party bridge or a switching facility without three-party connection capabilities. For a three-party bridge configuration the states of the handover/relocation device are as shown in table 2. The three-party configuration exists in the intermediate state. This type of handover/relocation device may reduce the interruption time. However, this may require noise reduction if one of the radio channels is unterminated at some time in the intermediate state.

For a handover/relocation device consisting of a simple switch there will be no intermediate state.

Next Change

4.4.1 Role of 3G_MSC-B

In the Intra-3G_MSC handover/relocation case, the 3G_MSC-B keeps the control of the whole Intra-3G_MSC handover/relocation procedure.

In the Inter-3G_MSC ~~handover/~~relocation case, the role of 3G_MSC-B (3G_MSC-B') is only to provide radio resources control within its area. This means that 3G_MSC-B keeps control of the radio resources connection and release towards RNS-B. 3G_MSC-B will do some processing on the BSSMAP information received on the E-interface or the RANAP information received on the Iu-interface whereas it will relay the Direct Transfer information transparently between Iu-interface and E-interface. 3G_MSC-A initiates and drives RANAP procedures as BSSMAP procedures towards 3G_MSC-B, while 3G_MSC-B controls them towards its RNSs to the extent that 3G_MSC-B is responsible for the connections of its RNSs. The release of the dedicated resources between 3G_MSC-B and RNS-B is under the responsibility of 3G_MSC-B and RNS-B, and is not directly controlled by 3G_MSC-A. When clearing is to be performed due to information received from RNS-B, 3G_MSC-B shall transfer this clearing indication to 3G_MSC-A, to clear its connection with RNS-B, to terminate the dialogue with 3G_MSC-A through the E-interface, and to release its circuit connection with 3G_MSC-A, if any. In the same way, the release of the connection to its RNS-B, is initiated by 3G_MSC-B, when the dialogue with 3G_MSC-A ends normally and a release is received from the circuit connection with 3G_MSC-A, if any, or when the dialogue with the 3G_MSC-A ends abnormally.

When a release is received by 3G_MSC-B for the circuit connection with 3G_MSC-A then 3G_MSC-B shall release the circuit connection.

In the Inter-system UMTS to GSM Inter-3G_MSC handover case, the role of 3G_MSC-B (3G_MSC-B') is only to provide radio resources control within its area. This means that 3G_MSC-B keeps control of the radio resources connection and release towards ~~RNS~~BSS-B. 3G_MSC-B will do some processing on the BSSMAP information received on the E-interface or the ~~RANAP~~ BSSMAP information received on the A~~Iu~~-interface whereas it will relay the ~~Direct Transfer~~DTAP information transparently between A~~Iu~~-interface and E-interface. 3G_MSC-A initiates and drives a subset of BSSMAP procedures towards 3G_MSC-B, while 3G_MSC-B controls them towards its ~~RNSs~~ BSSs to the extent that 3G_MSC-B is responsible for the connections of its ~~RNSs~~BSSs. The release of the dedicated resources between 3G_MSC-B and ~~RNS~~BSS-B is under the responsibility of 3G_MSC-B and ~~RNS~~BSS-B, and is not directly controlled by 3G_MSC-A. When clearing is to be performed due to information received from ~~RNS~~BSS-B, 3G_MSC-B shall transfer this clearing indication to 3G_MSC-A, to clear its connection with ~~RNS~~BSS-B, to terminate the dialogue with 3G_MSC-A through the E-interface, and to release its circuit connection with MSC-A, if any. In the same way, the release of the connection to its ~~RNS~~BSS-B, is initiated by 3G_MSC-B, when the dialogue with 3G_MSC-A ends normally and a release is received from the circuit connection with 3G_MSC-A, if any, or when the dialogue with the MSC-A ends abnormally.

When a release is received by 3G_MSC-B for the circuit connection with 3G_MSC-A then 3G_MSC-B shall release the circuit connection.

In the Inter-system GSM to UMTS Inter-3G_MSC handover case, the role of 3G_MSC-B (3G_MSC-B') is only to provide radio resources control within its area. This means that 3G_MSC-B keeps control of the radio resources connection and release towards RNS-B. 3G_MSC-B will do some processing on the BSSMAP information received on the E-interface or the RANAP information received on the Iu-interface whereas it will relay the Direct Transfer information transparently between Iu-interface and E-interface. MSC-A initiates and drives a subset of BSSMAP procedures towards 3G_MSC-B, while 3G_MSC-B controls them towards its RNSs to the extent that 3G_MSC-B is responsible for the connections of its RNSs. The release of the dedicated resources between 3G_MSC-B and RNS-B is under the responsibility of 3G_MSC-B and RNS-B, and is not directly controlled by MSC-A. When clearing is to be performed due to information received from RNS-B, 3G_MSC-B shall transfer this clearing indication to MSC-A, to clear its connection with RNS-B, to terminate the dialogue with MSC-A through the E-interface, and to release its circuit connection with MSC-A, if any. In the same way, the release of the connection to its RNS-B, is initiated by 3G_MSC-B, when the dialogue with MSC-A ends normally and a release is received from the circuit connection with MSC-A, if any, or when the dialogue with the MSC-A ends abnormally.

When a release is received by 3G_MSC-B for the circuit connection with MSC-A then 3G_MSC-B shall release the circuit connection.

Next Change

4.4.2 Functional composition of 3G_MSC-B and its interfaces for handover/relocation

The functional composition of a 3G_MSC acting as 3G_MSC-B is essentially the same as that of 3G_MSC-A. However, there are some differences. The functional units are as follows (see figure 6):

Signalling functions

1) RNC/BSC/3G_MSC (UE/MS/RNC/BSC) Procedures 3G_MSC-B. This unit is used to control the signalling between the 3G_MSC, RNC, BSC and UE/MS. Interface Iu' is the connection to the old RNC and i~~-~~nterface Iu" is the connection to the new RNC, when an Intra-3G_MSC ~~handover/~~relocation takes place. Interface Iu' is the connection to the old RNC and interface A" is the connection to the new BSC, when an Intra-3G_MSC UMTS to GSM handover takes place. Interface A' is the connection to the old BSC and interface Iu" is the connection to the new RNC, when an Intra-3G_MSC GSM to UMTS handover takes place. Interface x represents the interworking connection to the Handover/Relocation Control Procedures 3G_MSC-B.

2) Call Control Procedures 3G_MSC-B. This unit is used for normal call control and signalling to 3G_MSC-A or MSC-A in the case of inter-system inter-3G_MSC handover.

3) Handover/Relocation Control Procedures 3G_MSC-B. This unit provides both the overall control of the handover/relocation procedure and interworking between the internal interfaces (x, y and z) in 3G_MSC-B.

4) MAP Procedures 3G_MSC-B. This unit is responsible for controlling the exchange of MAP messages between 3G_MSC-A, or MSC-A, and 3G_MSC-B and for signalling to the VLR in 3G_MSC-B.

Switching functions

5) Switch 3G_MSC-B. For all calls this unit is responsible, with RNS-B, for connecting the circuit from 3G_MSC-A, or MSC-A, to RNS-B. This unit may also need to act as a handover/relocation device for Intra-3G_MSC handovers/relocation controlled by 3G_MSC-B. In specific cases it may be unnecessary to take any explicit action in the 3G_MSC concerning the handover/relocation device.

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

N1-000501

Document ~~***N1-000305***~~

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

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Source:	CN1		**Date:**	2000-03-02	
Subject:	Support of high speed data in UMTS/UTRAN				
Work item:	GSM/UMTS interworking				

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

Reason for change: In GSM multiple TCHs can be combined into a high speed bearer, which is indicated by some parameters in BC (Bearer Capability information element). Corresponding UMTS parameters are not needed as the UTRAN provides 'any size' bearers.

Clauses affected:

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.

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.

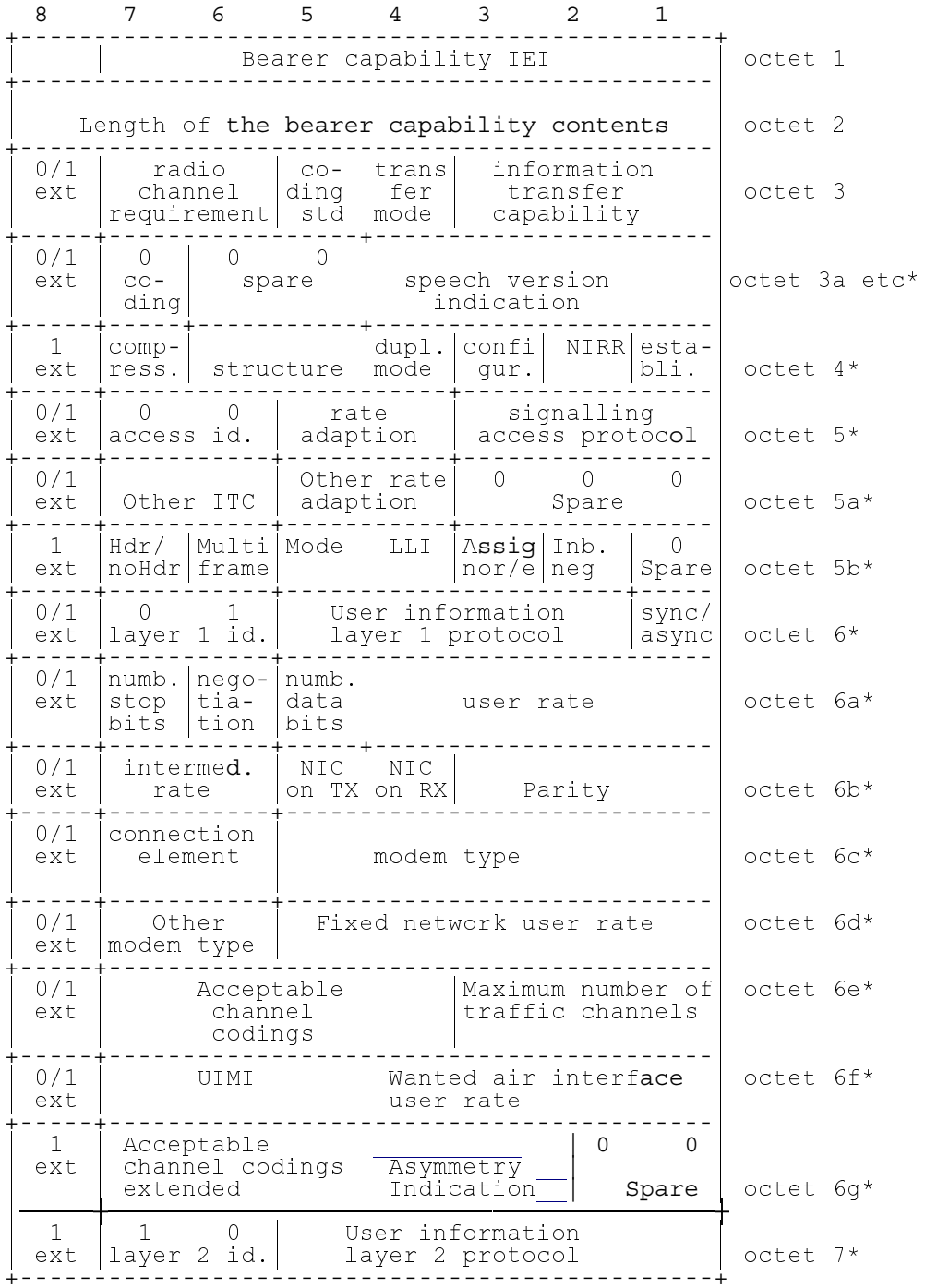

Figure 10.5.88/TS 24.008 Bearer capability information element

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 pure UMTS mobile station 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.

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

(continued...)

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

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

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

All other values are reserved

Table 10.5.103/TS 24.008 Bearer capability information element

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

Coding

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

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

Bits 5 and 6 are spare.

Speech version indication (octet(s) 3a etc.)
Bits
4 3 2 1
0 0 0 0 GSM full rate speech version 1
0 0 1 0 GSM full rate speech version 2
0 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 CCITT X.31 flag stuffing
1 1 Other rate adaption (see octet 5a)

Signalling access protocol (octet 5)

Bits
3 2 1
0 0 1 I.440/450
0 1 0 X.21
0 1 1 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 GSM, the value of H.223 and H.245 shall be interpreted as ‘no rate adaptation’.
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 0 10.3 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 V.23 (note 1)
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
0 1 V.32bis
1 0 V.34

All other values are reserved.

Fixed network user rate (octet 6d)
Bit
5 4 3 2 1
0 0 0 0 0 Fixed network user rate not applicable/No meaning is associated with this value.
0 0 0 0 1 9.6 kbit/s Recommendation X.1 and V.110
0 0 0 1 0 14.4 kbit/s Recommendation X.1 and V.110
0 0 0 1 1 19.2 kbit/s Recommendation X.1 and V.110
0 1 0 1 0 32.0 kbit/s Recommendation I.460 (note 2)
0 1 0 0 1 33.6 kbit/s bit transparent (note 2)
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
0 1 0 1 0 32.0 kbit/s Recommendation I.460

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:
~~In GSM only.~~

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:
~~In GSM only.~~

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”.

If

Table 10.5.114/TS 24.008: Bearer capability information element

UIMI, User initiated modification indication (octet 6f),
~~In GSM only.~~

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:
~~In GSM only.~~

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:
~~In GSM only.~~

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

Bits 2 and 1 are spare.

3GPP N1/SMG3 WPA Meeting #11
Umeå/Sweden, 28th Feb. - 3rd March, 2000

Document ***N1-00 0503***
revised N1-00 0331

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**	142 r1	Current Version:	3.2.1

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

For submission to: CN#7	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: CN1 **Date:** 02.03.00

Subject: Initial value for T3302

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:

According to the current definition, the timer T3302, which triggers a new registration attempt is the attempt counter has reached its limit, is initialised with initial value for the periodic location update timer T3212 from the CS domain. With this definition the configuration of the CS domain specific MS reachable functionality has also impact to the PS domain specific registration procedure. This has the drawback that the tow domains could not be configured independently. As the purpose of the GMM timer T3302 and the MM timer T3212 is completely different, it is proposed that the timer value for T3302 could be (optional) indicated by the network in the Attach and Routing area update accept and reject messages and for the case no specific value is assigned by the network via a GMM signalling procedure a default value is used by the MS.

Clauses affected: 9.4.2; 9.4.15; 11.2.2

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:

9.4.2 Attach accept

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

Message type: ATTACH ACCEPT

Significance: dual

Direction: network to MS

Table 9.4.2/TS 24.008: ATTACH ACCEPT message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Skip indicator	Skip indicator 10.3.1	M	V	1/2
	Attach accept message identity	Message type 10.4	M	V	1
	Attach result	Attach result 10.5.5.1	M	V	1/2
	Force to standby	Force to standby 10.5.5.7	M	V	1/2
	Periodic RA update timer	GPRS Timer 10.5.7.3	M	V	1
	Radio priority for SMS	Radio priority 10.5.7.2	M	V	1/2
	Spare half octet	Spare half octet 10.5.1.8	M	V	1/2
	Routing area identification	Routing area identification 10.5.5.15	M	V	6
19	P-TMSI signature	P-TMSI signature 10.5.5.8	O	TV	4
17	Negotiated READY timer value	GPRS Timer 10.5.7.3	O	TV	2
18	Allocated P-TMSI	Mobile identity 10.5.1.4	O	TLV	7
23	MS identity	Mobile identity 10.5.1.4	O	TLV	6 - 7
25	GMM cause	GMM cause 10.5.5.14	O	TV	2
2A	T3302 value	GPRS Timer 10.5.7.3	O	TLV	3

9.4.2.1 P-TMSI signature

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

9.4.2.2 Negotiated READY timer

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

9.4.2.3 Allocated P-TMSI

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

9.4.2.4 MS identity

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

9.4.2.5 GMM cause

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

9.4.2.6 T3302 value

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

9.4.4 Attach reject

This message is sent by the network to the MS to indicate that the corresponding attach request has been rejected. See table 9.4.4/TS 24.008.

Message type: ATTACH REJECT

Significance: dual

Direction: network to MS

Table 9.4.4/TS 24.008: ATTACH 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
	Attach reject message identity	Message type 10.4	M	V	1
	GMM cause	GMM cause 10.5.5.14	M	V	1
2A	T3302 value	GPRS Timer 10.5.7.3	O	TLV	3

9.4.4.1 T3302 value

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

9.4.15 Routing area update accept

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

Message type: ROUTING AREA UPDATE ACCEPT

Significance: dual

Direction: network to MS

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

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Skip indicator	Skip indicator 10.3.1	M	V	1/2
	Routing area update accept message identity	Message type 10.4	M	V	1
	Force to standby	Force to standby 10.5.5.7	M	V	1/2
	Update result	Update result 10.5.5.17	M	V	1/2
	Periodic RA update timer	GPRS Timer 10.5.7.3	M	V	1
	Routing area identification	Routing area identification 10.5.5.15	M	V	6
19	P-TMSI signature	P-TMSI signature 10.5.5.8	O	TV	4
18	Allocated P-TMSI	Mobile identity 10.5.1.4	O	TLV	7
23	MS identity	Mobile identity 10.5.1.4	O	TLV	7
26	List of Receive N-PDU Numbers	Receive N-PDU Number list 10.5.5.11	O	TLV	4 - 17
17	Negotiated READY timer value	GPRS Timer 10.5.7.3	O	TV	2
25	GMM cause	GMM cause 10.5.5.14	O	TV	2
2A	T3302 value	GPRS Timer 10.5.7.3	O	TLV	3

9.4.15.1 P-TMSI signature

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

9.4.15.2 Allocated P-TMSI

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

9.4.15.3 MS identity

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

9.4.15.4 List of Receive N-PDU Numbers

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

9.4.15.5 Negotiated READY timer value

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

9.4.15.6 GMM cause

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

9.4.15.7 T3302 value

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

9.4.17 Routing area update reject

This message is sent by the network to the MS in order to reject the routing area update procedure. See table 9.4.17/TS 24.008.

Message type: ROUTING AREA UPDATE REJECT

Significance: dual

Direction: network to MS

Table 9.4.17/TS 24.008: ROUTING AREA UPDATE 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
	Routing area update reject message identity	Message type 10.4	M	V	1
	GMM cause	GMM cause 10.5.5.14	M	V	1
	Force to standby	Force to standby 10.5.5.7	M	V	1/2
	Spare half octet	Spare half octet 10.5.1.8	M	V	1/2
2A	T3302 value	GPRS Timer 10.5.7.3	O	TLV	3

9.4.17.1 T3302 value

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

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	~~T3212~~Default 12 min Note 1 ~~4~~	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
T3316 AA-READY	Default 44 sec Note 2	-	Transmission of a PTP PDU	-	-
T3317 (UMTS only)	10s	GMM-REG	SERVICE REQ sent	Security mode setting 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.

~~NOTE 4: T3302 is loaded with the same value which is used to load T3212.~~

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	Retransmission of AUTH AND CIPH REQUEST
T3370	6s	GMM-COMMON-PROC-INIT	IDENTITY REQUEST sent	IDENTITY RESPONSE received	Retransmission of IDENTITY REQUEST

Table 11.4a/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
T3316 AA-READY	Default 44 sec Note 2	-	Receipt of a PTP PDU	-	-
Mobile Reachable	Default 4 min greater than T3312	All except GMM-DEREG	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/SMG Meeting TSG-CN1
Umeå, Sweden, 28 Feb – 03 Mar 2000

Document N1-000504
Rev of N1-000337

CHANGE REQUEST

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24.008	CR	145r1	Current Version:	3.2.1

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

For submission to: TSG CN#7 *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*

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

Source: CN1 **Date:** 2000-02-20

Subject: Intersystem change GSM <-> UMTS

Work item: GSM-UMTS Interworking

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

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

Release:

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

Reason for change:

This CR proposes:

- to clarify the description for an MS which has the READY timer is running in GSM or an MS which is in PMM-CONNECTED mode in UMTS at intersystem change.
- to move the description of the intersystem change GSM <-> UMTS from chapter 4.7.5.3 to a new chapter in 4.7.1.7.

Clauses affected: 4.7.1.6.3, 4.7.1.6.4, 4.7.1.7 (new), 4.7.5, 4.7.5.3 (deleted)

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:

4.7.1.6.3 Change of network mode of operation at UMTS to GSM inter-system change

Whenever an MS moves to a new RA supporting the GSM radio interface, the procedures executed by the MS depend on the network mode of operation in the old and new routing area.

~~Whenever an MS moves to a new cell supporting the GSM radio interface within the same RA, the procedures executed by the MS depend on the network mode of operation in the old and new routing area and may only be executed by the MS if the criteria's described in section 4.7.1.7 are fulfilled. the selective procedures as specified in section 4.7.5 apply.~~

In case the MS is in state GMM-REGISTERED or GMM-ROUTING-AREA-UPDATING-INITIATED and is in operation mode:

a) A in UMTS, an MS that changes to GPRS operation mode A or B in GSM shall execute:

Table 4.7.1.6.5/TS 24.008: Mode A in UMTS changing to GPRS mode A or B in GSM

Network operation mode change	Procedure to execute
UMTS I → GSM I	Combined Routing Area Update
UMTS II → GSM I	Combined Routing Area Update with IMSI attach
UMTS I → GSM II or UMTS I → GSM III	Normal Location Update(*), followed by a Normal Routing Area Update

b) A in UMTS, an MS that changes due to MS specific characteristics to GPRS operation mode C in network operation mode III in GSM shall execute:

Table 4.7.1.6.6/TS 24.008: Mode A in UMTS changing to GPRS mode C in GSM

Network operation mode change	Procedure to execute
UMTS I → GSM III or UMTS II → GSM III	IMSI detach (see section 4.3.4), followed by a Normal Routing Area Update

c) A in UMTS, an MS that changes due to MS specific characteristics to IMSI attached for CS services only in network operation mode III in GSM shall execute:

Table 4.7.1.6.7/TS 24.008: Mode A in UMTS changing to IMSI attached for CS services only in GSM

Network operation mode change	Procedure to execute
UMTS I → GSM III or UMTS II → GSM III	Normal Location Update (see section 4.4.1), followed by a GPRS Detach with detach type indicating “GPRS Detach”

d) C in UMTS, the MS shall change to GPRS operation mode C in GSM and shall execute the normal Routing Area Update procedure

e) CS in UMTS, the MS shall execute the normal Location Update procedure

(*) Intended to remove the Gs association in the MSC/VLR.

Further details are implementation issues.

~~4.7.1.6.3~~4.7.1.6.4 Change of network mode of operation at GSM to UMTS inter-system change

Whenever an MS moves to a new RA supporting the UMTS radio interface, the procedures executed by the MS depend on the network mode of operation in the old and new routing area.

~~Whenever an MS moves to a new cell supporting the UMTS radio interface w~~within ~~the same RA, the procedures executed by the MS depend on the network mode of operation in the old and new routing area and may only be executed by the MS if the criteria's described in section 4.7.1.7 case b) are fulfilled. the selective procedures as specified in section 4.7.5 apply.~~

In case the MS is in state GMM-REGISTERED or GMM-ROUTING-AREA-UPDATING-INITIATED and is in operation mode:

a) A or B in GSM, the MS shall change to operation mode A in UMTS and shall execute:

Table 4.7.1.6.8/TS 24.008: Mode A or B in GSM changing to mode A in UMTS

Network operation mode change	Procedure to execute
GSM I → UMTS I	Combined Routing Area Update
GSM II → UMTS I	Combined Routing Area Update with IMSI attach
GSM I → UMTS II	Normal Location Update(*), followed by a Normal Routing Area Update
GSM II → UMTS II or GSM III → UMTS II	Normal Location Update, followed by a Normal Routing Area Update

b) C in GSM, an MS that changes to operation mode C in UMTS shall execute a Normal Routing Area Update.

c) C in GSM, an MS that, due to MS specific characteristics operated in GPRS operation mode C in network operation mode III in GSM changes to operation mode A in UMTS shall execute:

Table 4.7.1.6.9/TS 24.008: Mode C changing to mode A in UMTS

Network operation mode change	Procedure to execute
GSM III → UMTS I	Combined Routing Area Update with IMSI attach
GSM III → UMTS II	IMSI attach (see section 4.4.3), Followed by a Normal Routing Area Update

d) IMSI attached for non-GPRS services only, an MS that, due to MS specific characteristics, operated in network operation mode III in GSM and changes to operation mode A in UMTS shall execute:

Table 4.7.1.6.10/TS 24.008: IMSI attached for non-GPRS services only changing to mode A in UMTS

Network operation mode change	Procedure to execute
GSM III → UMTS I	Combined GPRS Attach for GPRS and non-GPRS services
GSM III → UMTS II	GPRS Attach

(*) Intended to remove the Gs association in the MSC/VLR.

Further details are implementation issues.

4.7.1.7 Intersystem change between GSM and UMTS

For the UMTS to GSM and GSM to UMTS intersystem change the following cases can be distinguished:

a) Intersystem change between cells belonging to different RA's

The procedures executed by the MS depends on the network mode of operation in the old and new RA. If a change of the network operation mode has occurred in the new RA, then the MS shall behave as specified in section 4.7.1.6. If no change of the network operation mode has occurred in the new RA, then the MS shall initiate the normal or combined RA update procedure depending on the network operation mode in the current RA.

b) Intersystem change between cells belonging to the same RA

If the READY timer is running in the MS in GSM or the MS is in PMM-CONNECTED mode in UMTS, then the MS shall perform a normal or combined RA update procedure depending on the network mode of operation in the current RA.

If the READY timer is not running in the MS in GSM or the MS is in PMM-IDLE mode in UMTS, then the MS shall not perform a RA update procedure (as long as the MS stays within the same RA) until up-link user data or signalling information needs to be sent from the MS to the network.

- If the MS is in the same access network, GSM or UMTS, as when it last sent user data or signalling messages, the procedures defined for that access system shall be followed. This shall be sending of an LLC PDU in a GSM cell or initiating the SERVICE REQUEST procedure in a UMTS cell.

- If the MS is in a different access network, GSM or UMTS, as when it last sent user data or signalling messages, the normal or combined RA update procedure shall be performed depending on the network operation mode in the current RA, before the sending of user data or signalling messages. If the signalling message is a DETACH REQUEST containing cause "power off", the RA update procedure need not to be performed.

- If the periodic routing area update timer expires the MS shall initiate the periodic RA update procedure.

If the READY timer is not running in the network in GSM or the network is in PMM-IDLE mode in UMTS, then the network shall page the MS if down-link user data or signalling information needs to be sent from the network to the MS. This shall include both GSM and UMTS cells.

- If the MS receives the paging indication in the same access network, GSM or UMTS, as when it last sent user data or signalling information, the MS shall send any LLC PDU in a GSM cell or shall initiate the SERVICE REQUEST procedure indicating service type “paging response” in a UMTS cell.

- If the MS receives the paging indication in a different access network, GSM or UMTS, as when it last sent user data or signalling information, the normal or combined RA update procedure shall be performed depending on the network operation mode in the current RA.

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

4.7.5 Routing area updating procedure

This procedure is used for:

- normal routing area updating to update the registration of the actual routing area of an MS in the network. This procedure is used by GPRS MSs in MS operation mode C and by GPRS MSs in MS operation modes A or B that are IMSI attached for GPRS and non-GPRS services if the network operates in network operation mode II or III;

- combined routing area updating to update the registration of the actual routing and location area of an MS in the network. This procedure is used by GPRS MSs in MS operation modes A or B that are IMSI attached for GPRS and non-GPRS services provided that the network operates in network operation mode I; or

- periodic routing area updating. This procedure is used by GPRS MSs in MS operation mode C and by GPRS MSs in MS operation modes A or B that are IMSI attached for GPRS or for GPRS and non-GPRS services independent of the network operation mode;

- IMSI attach for non-GPRS services when the MS is IMSI attached for GPRS services. This procedure is used by GPRS MSs in MS operation modes A or B, if the network operates in network operation mode I.

- in GSM, resuming GPRS services when the RR sublayer indicated a resumption failure after dedicated mode was left, see GSM 04.18.

- UMTS to GSM and for GSM to UMTS intersystem change, see section 4.7.1.7.

~~An MS that uses the GSM radio interface in an RA and moves to a new RA in UMTS or an MS that uses the UMTS radio interface in an RA and moves to a new RA in GSM, shall initiate the normal or combined routing area update procedure, as specified in section 4.7.1.6. An MS that uses the GSM radio interface in a cell and moves to a new UMTS cell within the same RA or an MS that uses the UMTS radio interface in a cell and moves to a new GSM cell within the same RA, shall selectively initiate the routing area update procedure as specified in section 4.7.1.6.~~

Section 4.7.5.1 describes the routing area updating procedures for updating the routing area only. The combined routing area updating procedure used to update both the routing and location area is described in section 4.7.5.2.

The routing area updating procedure is always initiated by the MS. It is only invoked in state GMM-REGISTERED.

To limit the number of subsequently rejected routing area update attempts, a routing area updating attempt counter is introduced. The routing area updating attempt counter shall be incremented as specified in section 4.7.5.1.5. Depending on the value of the routing area updating attempt counter, specific actions shall be performed. The routing area updating attempt counter shall be reset when:

- a GPRS attach procedure is successfully completed; or

- a routing area updating procedure is successfully completed;

and additionally when the MS is in substate ATTEMPTING-TO-UPDATE:

- a new routing area is entered;

- expiry of timer T3302; or

- at request from registration function.

The mobile equipment shall contain a list of “forbidden location areas for roaming”, as well as a list of “forbidden location areas for regional provision of service”. The handling of these lists is described in section 4.4.1.

In, GSM, user data transmission in the MS shall be suspended during the routing area updating procedure; user data reception shall be possible. User data transmission in the network shall be suspended during the routing area updating procedure, if a new P-TMSI is assigned.

In UMTS, user data transmission and reception in the MS shall not be suspended during the routing area updating procedure. User data transmission in the network shall not be suspended during the routing area updating procedure.

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

4.7.5.3 Selective routing area update procedure

The selective routing area updating procedure is used at UMTS to GSM and GSM to UMTS intersystem change at cell change within the same RA.

4.7.5.3.1 Uplink signalling / data transmission

In GPRS STANDBY or PMM-IDLE mode, the MS shall not perform a RA update procedure (as long as the MS stays within the same RA) until up-link user data or signalling information is to be sent from the MS.

- If the MS is in the same access network as when it last sent user data or signalling messages, the procedures defined for that access system shall be followed. This shall be sending of an LLC PDU in a GPRS cell or initiating the SERVICE REQUEST procedure in a UMTS cell.
- If the MS is in a different access network as when it last sent user data or signalling messages, the RA update procedure shall be performed before the sending of user data or signalling messages.
- If the periodic routing area update timer expires the MS shall initiate the periodic routing area update procedure.

4.7.5.3.2 Downlink signalling / data transmission

If the 2G/3G SGSN receives user data for an MS in GPRS STANDBY or PMM-IDLE, the SGSN shall page the RA where the MS is located. This may include both GPRS and UMTS cells.

- If the MS receives this page in the same access network as when it last sent user data or signalling messages, the procedures defined for that access system shall be followed. This shall be sending of an LLC PDU in a GPRS cell or initiating the SERVICE REQUEST procedure in a UMTS cell.
- If the MS receives this page in a different access network as when it last sent user data or signalling message, the RA update procedure shall be performed.

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

Document N1-000507
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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24.008	**CR**	**158r1**	Current Version:	3.2.1

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

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

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

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

Source: CN1 **Date:** 16 February, 2000

Subject: Duplicated PDP context activation

Work item: GSM/UMTS Interwork

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

Reason for change: If any duplication is identified (e.g. TI, NSAPI, APN + PDP address) regarding newly requested PDP context and existing one, then existing context shall be implicitly deactivated and new request shall be progressed, not rejecting new request, since the duplication clearly indicates that the MS has forgotten the old PDP context.

Clauses affected: 6.1.3.1, 10.5.6.6

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:

6.1.3.1 PDP context activation

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

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

6.1.3.1.1 Successful PDP context activation initiated by the mobile station

In order to request a PDP context activation, the MS sends an ACTIVATE PDP CONTEXT REQUEST message to the network, enters the state PDP-ACTIVE-PENDING and starts timer T3380. The message contains the selected NSAPI, PDP type, requested QoS and, if the MS requests a static address, the PDP address. The MS shall ensure that the selected NSAPI is not currently being used by another Session Management entity in the MS.

Upon receipt of an ACTIVATE PDP CONTEXT REQUEST message, the network selects a radio priority level based on the QoS negotiated and may reply with an ACTIVATE PDP CONTEXT ACCEPT message. Upon receipt of the message ACTIVATE PDP CONTEXT ACCEPT the MS shall stop timer T3380, shall enter the state PDP-ACTIVE. If the offered QoS parameters received from the network differ from the QoS requested by the MS, the MS shall either accept the negotiated QoS or initiate the PDP context deactivation procedure.

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

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

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

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

6.1.3.1.2 Successful PDP context activation requested by the network

In order to request a PDP context activation, the network sends a REQUEST PDP CONTEXT ACTIVATION message to the MS and starts timer T3385. If available, the APN shall be included in the REQUEST PDP CONTEXT ACTIVATION message.

Upon receipt of a REQUEST PDP CONTEXT ACTIVATION message, the MS shall than either initiate the PDP context activation procedure as described in the previous section or shall reject the activation request by sending a REQUEST PDP CONTEXT ACTIVATION REJECT message as described in section 6.1.3.1.4. The value of the reject cause IE of the REQUEST PDP CONTEXT ACTIVATION REJECT message shall indicate the reason for rejection, e.g. “insufficient resources to activate another context”.

The ACTIVATE PDP CONTEXT REQUEST message sent by the MS in order to initiate the PDP context

activation procedure shall contain the PDP address, PDP Type and APN requested by the network in the REQUEST PDP CONTEXT ACTIVATION message.

Upon receipt of the ACTIVATE PDP CONTEXT REQUEST message, the network shall stop timer T3385.

The same procedures then apply as described for MS initiated PDP context activation.

6.1.3.1.3 Unsuccessful PDP context activation initiated by the MS

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

26: insufficient resources;
27: missing or unknown APN;
28: unknown PDP address or PDP type;
29: user authentication failed;
30: activation rejected by GGSN;
31: activation rejected, unspecified;
32: service option not supported;
33: requested service option not subscribed;
34: service option temporarily out of order;
~~# 35: NSAPI already used;~~ or
95 - 111: protocol errors.

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

6.1.3.1.4 Unsuccessful PDP context activation requested by the network

Upon receipt of the REQUEST PDP CONTEXT ACTIVATION message, the MS may reject the network requested PDP context activation by sending the REQUEST PDP CONTEXT ACTIVATION REJECT message to the network. The message contains all parameters of the REQUEST PDP CONTEXT ACTIVATION and an additional cause code that typically indicates one of the following causes:

26: insufficient resources;
31: activation rejected, unspecified;
40: feature not supported; or
95 - 111: protocol errors.

The network shall stop timer T3385 and enter state PDP-INACTIVE.

6.1.3.1.5 Abnormal cases

The following abnormal cases can be identified:

a) Expiry of timers

In the mobile station:

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

On the network side:

On the first expiry of the timer T3385, the network shall resend the message REQUEST PDP CONTEXT ACTIVATION and shall reset and restart timer T3385. This retransmission is repeated four times, i.e. on the fifth expiry of timer T3385, the network shall release possibly allocated resources for this activation and shall abort the procedure.

b) Collision of MS initiated and network requested PDP context activation

Dynamic PDP address collision case:

If the MS uses dynamic PDP addressing that turns out to collide with the network requested PDP address, then there is no detection of collision specified but left for network implementation.

Static PDP address collision detected within the mobile station:

A collision of an MS initiated and a network requested PDP context activation procedure is identified by the MS if a REQUEST PDP CONTEXT ACTIVATION message is received from the network after the MS has sent an ACTIVATE PDP CONTEXT REQUEST message, and the MS has not yet received an ACTIVATE PDP CONTEXT ACCEPT or ACTIVATE PDP CONTEXT REJECT message.

Note: In general, the MS is unable to test if the PDP type, PDP address and APN in the REQUEST PDP CONTEXT ACTIVATION message are the same as those for the PDN to which it is attempting to activate a context. This is because the MS may have omitted one or more of the parameters in the ACTIVATE PDP CONTEXT REQUEST message, since it is relying on default values to be provided by the network.

In the case of such a collision, the MS initiated PDP context activation shall take precedence over the network requested PDP context activation. If the MS is able to compare the PDP type, PDP address and APN requested in the ACTIVATE PDP CONTEXT REQUEST message with those requested in the REQUEST PDP CONTEXT ACTIVATION message and these parameters are equal, then the MS shall discard the REQUEST PDP CONTEXT ACTIVATION message and shall wait for the network response to its ACTIVATE PDP CONTEXT REQUEST message. Otherwise the MS shall send a REQUEST PDP CONTEXT ACTIVATION REJECT message with the cause 'insufficient resources' to the network, and wait for an ACTIVATE PDP CONTEXT ACCEPT message.

Static PDP address collision detected on the network side:

A collision is detected by the network in the case where the PDP address, PDP type and APN derived (according to 23.060 annex A) from the ACTIVATE PDP CONTEXT REQUEST message received from the MS match those in the REQUEST PDP CONTEXT ACTIVATION message sent to the MS.

In the case of such a collision, the MS initiated PDP context activation shall take precedence over the network requested PDP context activation. The network shall terminate the network requested PDP context activation procedure, and proceed with the MS initiated PDP context activation procedure

c) MS initiated PDP context activation request for an already activated PDP context (on the network side)

i) If all parameters of the new ACTIVATE PDP CONTEXT REQUEST message match with those of a previously activated PDP context without linked PDP context (activated contexts with the same PDP type, PDP address and APN) and the context to be activated uses static PDP addressing , then the network may reply with an ACTIVATE PDP CONTEXT ACCEPT message immediately. If dynamic PDP addressing is indicated for the new context then it is left for the implementation to decide if the PDP addresses match.

ii) Alternatively the network shall take the action described below:

- If the combination of PDP Type, PDP address and APN matches with those of an already activated PDP context(s), the network shall deactivate all these existing PDP contexts, which match the combination of APN, PDP type and PDP address, locally without notification to the MS and proceed with the requested PDP context activation.

- Otherwise, if the NSAPI matches one of an already activated PDP context(s), then the network shall deactivate this PDP context and all the PDP contexts linked with this one locally without notification to the MS and proceed with the activation of the requested PDP context activation.

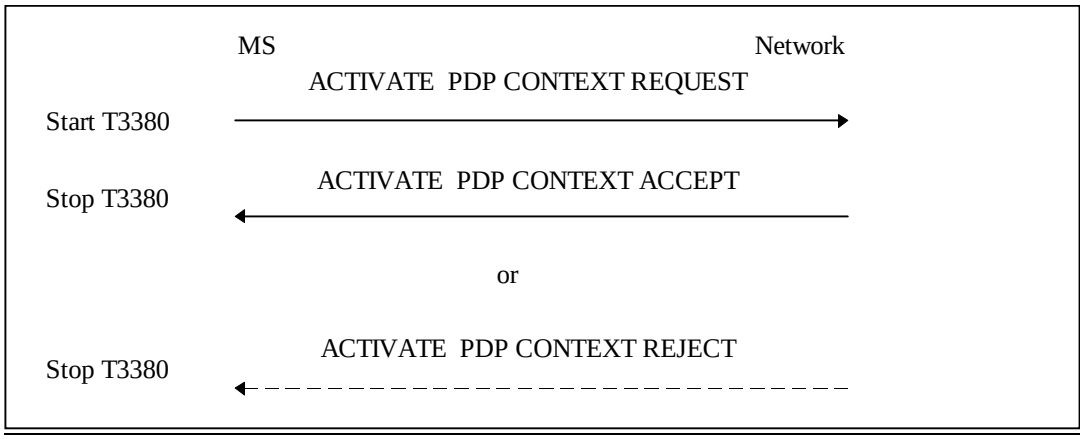

Figure 6.3/TS 24.008: MS initiated PDP context activation procedure

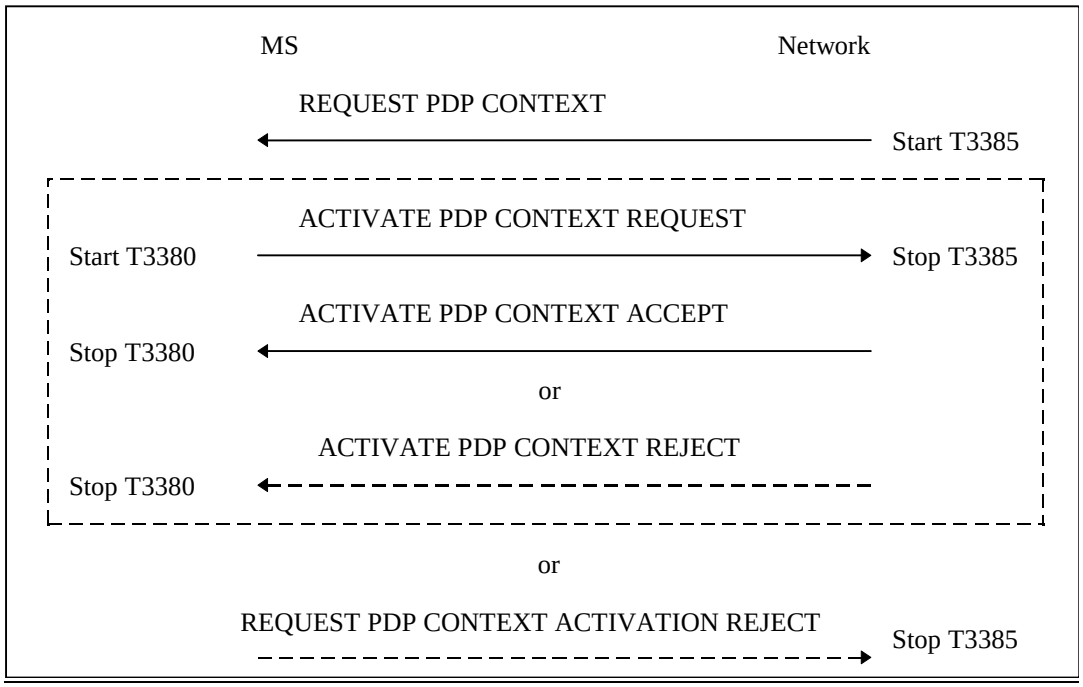

Figure 6.4/TS 24.008: Network initiated PDP context activation procedure

6.1.3.2 Secondary PDP Context Activation Procedure

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

6.1.3.2.1 Successful Secondary PDP Context Activation Initiated by the MS

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

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

ACCEPT message, if the request can be accepted.

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

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

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

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

NOTE: The radio priority level and the LLC SAPI parameters, though not used in UMTS, shall be included in the messages, in order to support handover between UMTS and GSM networks.6.1.3.2.2 Unsuccessful Secondary PDP Context Activation initiated by the MS

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

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

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

6.1.3.2.3 Abnormal cases

The following abnormal cases can be identified:

a) Expiry of timers

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

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

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

ii) Alternatively the network shall take the action described below:

- If the NSAPI matches one of an already activated PDP context, the network shall deactivate the existing one locally without notification to the MS and proceed with the requested PDP context activation.

Otherwise, the network shall check the parameters as follows:

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

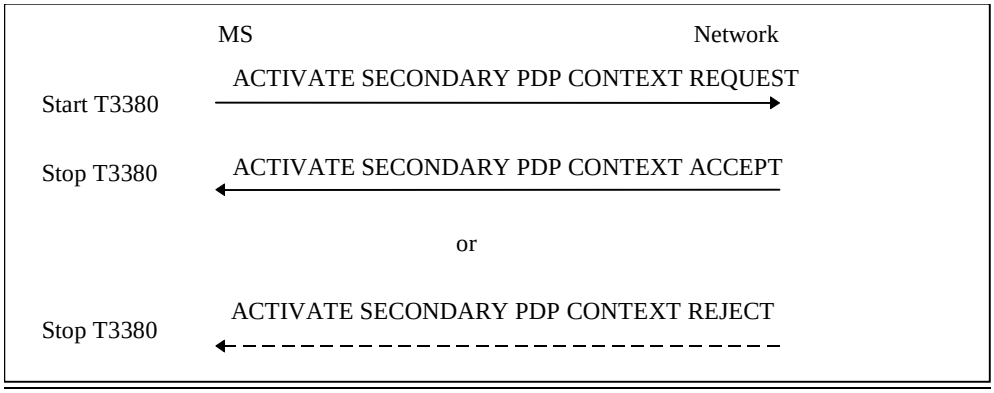

Figure 6.5/TS 24.008: MS initiated secondary PDP context activation procedure

10.5.6.6 SM cause

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

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

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

8	7	6	5	4	3	2	1	
SM cause IEI								octet 1
Cause value								octet 2

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

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

Cause value (octet 2) Bits 8 7 6 5 4 3 2 1	
0 0 0 1 1 0 0 1	LLC or SNDCP failure(GSM only)
0 0 0 1 1 0 1 0	Insufficient resources
0 0 0 1 1 0 1 1	Missing or unknown APN
0 0 0 1 1 1 0 0	Unknown PDP address or PDP type
0 0 0 1 1 1 0 1	User Aauthentication failed
0 0 0 1 1 1 1 0	Activation rejected by GGSN
0 0 0 1 1 1 1 1	Activation rejected, unspecified
0 0 1 0 0 0 0 0	Service option not supported
0 0 1 0 0 0 0 1	Requested service option not subscribed
0 0 1 0 0 0 1 0	Service option temporarily out of order
~~0 0 1 0 0 0 1 1~~	~~NSAPI already used~~
0 0 1 0 0 1 0 0	Regular deactivation
0 0 1 0 0 1 0 1	QoS not accepted
0 0 1 0 0 1 1 0	Network failure
0 0 1 0 0 1 1 1	Reactivation required
0 0 1 0 1 0 0 1	TFT already used
0 0 1 0 1 0 1 1	Invalid TFT
0 0 1 0 1 1 0 0	Unknown PDP context
0 1 0 1 0 0 0 1	Invalid transaction identifier value
0 1 0 1 1 1 1 1	Semantically incorrect message
0 1 1 0 0 0 0 0	Invalid mandatory information
0 1 1 0 0 0 0 1	Message type non-existent or not implemented
0 1 1 0 0 0 1 0	Message type not compatible with the protocol state
0 1 1 0 0 0 1 1	Information element non-existent or not implemented
0 1 1 0 0 1 0 0	Conditional IE error
0 1 1 0 0 1 0 1	Message not compatible with the protocol state
0 1 1 0 1 1 1 1	Protocol error, unspecified

Any other value received by the mobile station shall be treated as 0010 0010, 'Service option temporarily out of order'. Any other value received by the network shall be treated as 0110 1111, 'Protocol error, unspecified'.

NOTE: The listed cause values are defined in Annex I

I.1 Causes related to nature of request

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

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

Cause value = 26 Insufficient resources

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

Cause value = 27 Unknown or missing access point name

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

Cause value = 28 Unknown PDP address or PDP type

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

Cause value = 29 User authentication failed

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

Cause value = 30 Activation rejected by GGSN

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

Cause value = 31 Activation rejected, unspecified

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

Cause value = 32 Service option not supported

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

Cause value = 33 Requested service option not subscribed

See Annex G, section 4.

Cause value = 34 Service option temporarily out of order

See Annex G, section 4.

~~Cause value = 35 NSAPI already used~~

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

Cause value = 36 Regular PDP context deactivation

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

Cause value = 37 QoS not accepted

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

Cause value = 38 Network failure

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

Cause value = 39 Reactivation requested

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

Cause value = 40 Feature not supported

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

Cause value = 41 TFT already used

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

Cause value = 42 invalid TFT

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

Cause value = 43 unknown PDP context

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

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Document N1-000524
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**	**179**	Current Version:	3.2.1

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

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

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

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

Source: CN1 **Date:** 16 February, 2000

Subject: Correction of Service request procedure after the collision with Detach procedure

Work item: GSM/UMTS Interwork

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: In case of collision of Service request procedure and network initiated Detach procedure indicating “re-attach request”, the Service request procedure is aborted and an Attach procedure is initiated. Re-initiation of Service request procedure is not necessary since PS signalling connection has been established by the Attach procedure. Attach procedure may be followed by some procedures (e.g. PDP context activation procedure) depending on the condition before the collision, however such description is not necessary here, because it is not specific to Service request procedure itself.

Clauses affected: 4.7.13.5

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:

help.doc

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

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 ciphering mode setting procedure is completed, SERVICE ACCEPT or SERVICE REJECT message is received

The procedure shall be aborted.

c) T3317 expired

The procedure shall be aborted.

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 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 ifself 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. ~~Follow-on request pending may be indicated in the ATTACH REQUEST for the service, which was the trigger of the aborted Service request procedure, to restart after the completion of the GPRS attach request procedure.~~

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Umea, Sweden, 28 February - 03 March.2000

***Document* N1-000551**
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	168r2	Current Version:	3.2.1

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

For submission to:	TSG-CN#7	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: CN1 **Date:** 21 February, 2000

Subject: DRX parameter for UMTS

Work item: GSM / UMTS Interwork

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

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

Reason for change: UTRAN applies UE specific DRX cycle length so that "CN Specific DRX cycle length coefficient" is expected to be supplied from the CN. Following the decision, DRX parameter is updated to contain the information.

Clauses affected: 9.4.2, 9.4.15, 10.5.5.6, 10.5.5.x

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.

10.5.5.6 DRX parameter

The purpose of the *DRX parameter* information element is to indicate whether the MS uses DRX mode or not.

The *DRX parameter* is a type 3 information element with a length of 3 octets.

The value part of a *DRX parameter* information element is coded as shown in table 10.5.139/TS 24.008.

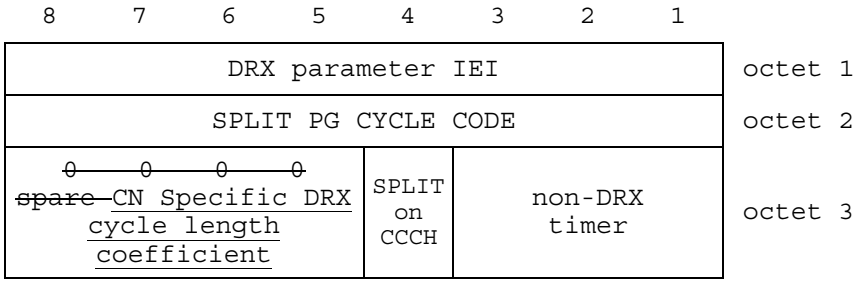

Figure 10.5.122/TS 24.008: DRX parameter information element

Table 10.5.139/TS 24.008: DRX parameter information element

SPLIT PG CYCLE CODE, octet 2
The octet contains the binary coded value of the SPLIT PG CYCLE CODE. The SPLIT PG CYCLE value is derived from the SPLIT PG CYCLE CODE as follows:

SPLIT PG CYCLE CODE	SPLIT PG CYCLE value
0	704 (equivalent to no DRX)
1 to 64	1 to 64, respectively
65	71
66	72
67	74
68	75
69	77
70	79
71	80
72	83
73	86
74	88
75	90
76	92
77	96
78	101
79	103
80	107
81	112
82	116
83	118
84	128
85	141
86	144
87	150
88	160
89	171
90	176
91	192
92	214
93	224
94	235
95	256
96	288
97	320
98	352

All other values are reserved and shall be interpreted as 1 by this version of the protocol.

SPLIT on CCCH, octet 3 (bit 4)

0 Split pg cycle on CCCH is not supported by the mobile station
1 Split pg cycle on CCCH is supported by the mobile station

non-DRX timer, octet 3
bit
3 2 1
0 0 0 no non-DRX mode after transfer state
0 0 1 max. 1 sec non-DRX mode after transfer state
0 1 0 max. 2 sec non-DRX mode after transfer state
0 1 1 max. 4 sec non-DRX mode after transfer state
1 0 0 max. 8 sec non-DRX mode after transfer state
1 0 1 max. 16 sec non-DRX mode after transfer state
1 1 0 max. 32 sec non-DRX mode after transfer state
1 1 1 max. 64 sec non-DRX mode after transfer state

~~Bits 8 to 5 of octet 3 are spare and shall be coded all zeros.~~
CN Specific DRX cycle length coefficient, octet 3
bit
8 7 6 5

0 0 0 0	CN Specific DRX cycle length coefficient not specified
0 0 0 1	Reserved
0 0 1 0	CN Specific DRX cycle length coefficient 2
0 0 1 1	CN Specific DRX cycle length coefficient 3
0 1 0 0	CN Specific DRX cycle length coefficient 4
0 1 0 1	CN Specific DRX cycle length coefficient 5
0 1 1 0	CN Specific DRX cycle length coefficient 6
0 1 1 1	CN Specific DRX cycle length coefficient 7
1 0 0 0	CN Specific DRX cycle length coefficient 8
1 0 0 1	CN Specific DRX cycle length coefficient 9
1 0 1 0	CN Specific DRX cycle length coefficient 10
1 0 1 1	CN Specific DRX cycle length coefficient 11
1 1 0 0	CN Specific DRX cycle length coefficient 12
1 1 0 1	Reserved
1 1 1 0	Reserved
1 1 1 1	Reserved

All reserved values shall be interpreted as “CN Specific DRX cycle length coefficient not specified” by this version of the protocol.

Note: This field is used only for UMTS RAN.