

Source: TSG CN WG 1
Title: CRs to R99 (with mirror CRs) on Work Item TEI towards 24.008
Agenda item: 7.11
Document for: APPROVAL

Introduction:

This document contains 9 CRs on R99 including mirror CRs to Work Item "TEI", that have been agreed by TSG CN WG1, and are forwarded to TSG CN Plenary meeting #17 for approval.

Spec	CR #	Rev	CAT	Rel	Tdoc Title	Meeting	TDoc #	C Version
24.008	665		F	R99	Usage of Service Request type 'data'	N1-25	N1-021669	3.12.0
24.008	666		A	Rel-4	Usage of Service Request type 'data'	N1-25	N1-021670	4.7.0
24.008	667		A	Rel-5	Usage of Service Request type 'data'	N1-25	N1-021671	5.4.0
24.008	671	3	F	R99	Correction to service request procedure	N1-25	N1-021854	3.12.0
24.008	672	3	A	Rel-4	Correction to service request procedure	N1-25	N1-021855	4.7.0
24.008	673	3	A	Rel-5	Correction to service request procedure	N1-25	N1-021856	5.4.0
24.008	676	1	F	R99	Routing Area Update at network change	N1-25	N1-021761	3.12.0
24.008	677	1	A	Rel-4	Routing Area Update at network change	N1-25	N1-021762	4.7.0
24.008	678	1	A	Rel-5	Routing Area Update at network change	N1-25	N1-021763	5.4.0

CR-Form-v7

CHANGE REQUEST

⌘ **24.008 CR 665** ⌘ rev **-** ⌘ Current version: **3.12.0** ⌘

For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Usage of Service Request type 'data'		
Source:	⌘ Siemens AG		
Work item code:	⌘ TEI	Date:	⌘ 23.07.2002
Category:	⌘ F	Release:	⌘ R99
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)	2	(GSM Phase 2)
	A (corresponds to a correction in an earlier release)	R96	(Release 1996)
	B (addition of feature),	R97	(Release 1997)
	C (functional modification of feature)	R98	(Release 1998)
	D (editorial modification)	R99	(Release 1999)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900.	Rel-4	(Release 4)
		Rel-5	(Release 5)
		Rel-6	(Release 6)

Reason for change:	⌘ It is nowhere clearly defined which NAS messages in the PS domain may be sent as initial message in order to establish the PS signaling connection without sending the SERVICE REQUEST. In sec. 4.7.13 it is only stated the a Service Request shall be used for all those NAS messages which "requires security protection". But there is no definition for which messages a security protection in UMTS. There is only a definition for GSM in sec. 4.7.1.2.
Summary of change:	⌘ It is proposed to clarify that all GMM messages may be send directly without a preceding service request procedure.
Consequences if not approved:	⌘ Risk of different MS and network implementations due to the missing definition which could in the worst case lead to a deadlock, i.e. if the network does not accept a Detach Request as initial message.

Clauses affected:	⌘ 4.7.13										
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;">⌘</td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;">⌘</td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;">⌘</td> <td style="text-align: center;">X</td> </tr> </table>	Y	N	⌘	X	⌘	X	⌘	X	Other core specifications	⌘
Y	N										
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⌘	X										
		Test specifications									
		O&M Specifications									
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 mode or may alternatively be the PMM-CONNECTED mode if the MS requires radio access bearer re-establishment. 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 (in PMM-IDLE or PMM CONNECTED) and downlink (only in PMM-IDLE) user data.

For downlink transfer of signalling or user data in PMM-IDLE mode, the trigger is given from the network by the paging request procedure, which is out of scope of the present document.

For pending downlink user data in PMM-CONNECTED mode, the re-establishment of radio access bearers for all active PDP contexts is done without paging.

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 messages except GMM messages (e.g. for SM or SMS), ~~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 or PMM-CONNECTED mode, has pending user data to be sent and no radio access bearer is established for the corresponding PDP context. The procedure is initiated by an indication from the lower layers (see 3GPP TS 24.007). In this case, the service type shall be set to "data".
- c) the MS receives a paging request for PS domain from the network in PMM-IDLE mode. In this case, the service type shall be set to "paging response".

After completion of a Service request procedure but before re-establishment of radio access bearer, if the PDP context status information element is included, then the network should deactivate all those PDP contexts locally (without peer to peer signalling between the MS and the network), which are not in SM state PDP-INACTIVE on network side but are indicated by the MS as being in state PDP-INACTIVE.

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.

*** next section for information only ***

4.7 Elementary mobility management procedures for GPRS services

4.7.1 General

This subclause describes the basic functions offered by the mobility management (GMM) sublayer at the radio interface (reference point U_m/U_j). The functionality is described in terms of timers and procedures. During GMM procedures, session management procedures and SMS procedures, see clause 6, are suspended.

4.7.1.1 Lower layer failure

The lower layers shall indicate a logical link failure or an RR sublayer failure or an RRC sublayer failure to the GMM sublayer. The failure indicates an error that cannot be corrected by the lower layers.

4.7.1.2 Ciphering of messages (GSM only)

If ciphering is to be applied on a GMM context, all GMM messages shall be ciphered except the following messages:

- ATTACH REQUEST;
- ATTACH REJECT;
- AUTHENTICATION AND CIPHERING REQUEST;
- AUTHENTICATION AND CIPHERING RESPONSE;
- AUTHENTICATION AND CIPHERING REJECT;
- IDENTITY REQUEST;
- IDENTITY RESPONSE;
- ROUTING AREA UPDATE REQUEST; and
- ROUTING AREA UPDATE REJECT.

CHANGE REQUEST

⌘ **24.008 CR 666** ⌘ rev **-** ⌘ Current version: **4.7.0** ⌘

For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Usage of Service Request type 'data'		
Source:	⌘ Siemens AG		
Work item code:	⌘ TEI	Date:	⌘ 23.07.2002
Category:	⌘ A	Release:	⌘ REL-4
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)	R96	(GSM Phase 2)
	A (corresponds to a correction in an earlier release)	R97	(Release 1996)
	B (addition of feature),	R98	(Release 1997)
	C (functional modification of feature)	R99	(Release 1998)
	D (editorial modification)	Rel-4	(Release 1999)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900.	Rel-5	(Release 4)
		Rel-6	(Release 5)
			(Release 6)

Reason for change:	⌘ It is nowhere clearly defined which NAS messages in the PS domain may be sent as initial message in order to establish the PS signaling connection without sending the SERVICE REQUEST. In sec. 4.7.13 it is only stated the a Service Request shall be used for all those NAS messages which "requires security protection". But there is no definition for which messages a security protection in UMTS. There is only a definition for GSM in sec. 4.7.1.2.
Summary of change:	⌘ It is proposed to clarify that all GMM messages may be send directly without a preceding service request procedure.
Consequences if not approved:	⌘ Risk of different MS and network implementations due to the missing definition which could in the worst case lead to a deadlock, i.e. if the network does not accept a Detach Request as initial message.

Clauses affected:	⌘ 4.7.13										
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;">⌘</td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;">⌘</td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;">⌘</td> <td style="text-align: center;">X</td> </tr> </table>	Y	N	⌘	X	⌘	X	⌘	X	Other core specifications	⌘
Y	N										
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⌘	X										
⌘	X										
		Test specifications									
		O&M Specifications									
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 mode or may alternatively be the PMM-CONNECTED mode if the MS requires radio access bearer re-establishment. 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 (in PMM-IDLE or PMM CONNECTED) and downlink (only in PMM-IDLE) user data.

For downlink transfer of signalling or user data in PMM-IDLE mode, the trigger is given from the network by the paging request procedure, which is out of scope of the present document.

For pending downlink user data in PMM-CONNECTED mode, the re-establishment of radio access bearers for all active PDP contexts is done without paging.

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.

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- b) the MS, either in PMM-IDLE or PMM-CONNECTED mode, has pending user data to be sent and no radio access bearer is established for the corresponding PDP context. The procedure is initiated by an indication from the lower layers (see 3GPP TS 24.007 [20]). 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 but before re-establishment of radio access bearer, if the PDP context status information element is included, then the network shall deactivate all those PDP contexts locally (without peer to peer signalling between the MS and the network), which are not in SM state PDP-INACTIVE on network side but are indicated by the MS as being in state PDP-INACTIVE.

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.

CHANGE REQUEST

⌘ **24.008 CR 667** ⌘ rev **-** ⌘ Current version: **5.4.0** ⌘

For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Usage of Service Request type 'data'		
Source:	⌘ Siemens AG		
Work item code:	⌘ TEI	Date:	⌘ 23.07.2002
Category:	⌘ A	Release:	⌘ REL-5
	Use <u>one</u> of the following categories: F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.		Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) Rel-4 (Release 4) Rel-5 (Release 5) Rel-6 (Release 6)

Reason for change:	⌘ It is nowhere clearly defined which NAS messages in the PS domain may be sent as initial message in order to establish the PS signaling connection without sending the SERVICE REQUEST. In sec. 4.7.13 it is only stated the a Service Request shall be used for all those NAS messages which "requires security protection". But there is no definition for which messages a security protection in UMTS. There is only a definition for GSM in sec. 4.7.1.2.
Summary of change:	⌘ It is proposed to clarify that all GMM messages may be send directly without a preceding service request procedure.
Consequences if not approved:	⌘ Risk of different MS and network implementations due to the missing definition which could in the worst case lead to a deadlock, i.e. if the network does not accept a Detach Request as initial message.

Clauses affected:	⌘ 4.7.13						
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table> Other core specifications	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	⌘	
Y	N						
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	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table> Test specifications	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	⌘	
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Y	N						
<input type="checkbox"/>	<input checked="" type="checkbox"/>						
Other comments:	⌘						

4.7.13 Service Request procedure (UMTS only)

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- the initiation of CM layer service (e.g. SM or SMS) procedure from the MS in PMM-IDLE mode,
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For pending downlink user data in PMM-CONNECTED mode, the re-establishment of radio access bearers for all active PDP contexts is done without paging.

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 messages except GMM messages (e.g. for SM or SMS), ~~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 or PMM-CONNECTED mode, has pending user data to be sent and no radio access bearer is established for the corresponding PDP context. The procedure is initiated by an indication from the lower layers (see 3GPP TS 24.007 [20]). In this case, the service type shall be set to "data".
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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.

CHANGE REQUEST

⌘ **24.008 CR 676** ⌘ rev **-1** ⌘ Current version: **3.12.0** ⌘

For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Routing Area Update at network change		
Source:	⌘ Orange France, Siemens AG		
Work item code:	⌘ TEI	Date:	⌘ 22/07/2002
Category:	⌘ F	Release:	⌘ R99
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)		2 (GSM Phase 2)
	A (corresponds to a correction in an earlier release)		R96 (Release 1996)
	B (addition of feature),		R97 (Release 1997)
	C (functional modification of feature)		R98 (Release 1998)
	D (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900.		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)

Reason for change:	⌘ Currently, in TS24.008 the behaviour of an MS attached to the packet domain is not clear when entering a new PLMN. CR 275rev2 on TS23.060 (included in SP-010706 – SA#14) clarified that Routing Area Update procedure shall be performed in such a case (and not Attach procedure). <u>This CR also includes correction and missing information in the current version of the specification regarding the GMM-REGISTERED.PLMN-SEARCH with is mentioned and not defined.</u>
Summary of change:	⌘ It is indicated that, to trigger the normal routing area updating to update the registration of the actual routing area of an MS in the network, the new routing area can belong to the same PLMN as the old routing area or not. <u>Corrections and missing information:</u> <ul style="list-style-type: none"> - in §4.7.5.1.5, GMM-REGISTERED.PLMN-SEARCH is mentioned but is not defined (definition added in §4.1.3.1.3 and in §4.2.5.1) - in §4.7.5.1.5, reference to GMM-REGISTERED.PLMN-SEARCH section is corrected, bullet before ' If the routing area updating attempt counter is greater than or equal to 5:' is removed (not the text, just the bullet) - when the maximum number of RAU attempts is reached the MS shall go to PLMN-SEARCH substate within the GMM-REGISTERED state and not within the GMM-DEREGISTERED state as defined currently.
Consequences if not approved:	⌘ Misalignment between R99 specifications and different MS behaviours.

Clauses affected: ⌘ §, 4.1.3.1.3, §4.2.4.1.2, §4.2.5.1, §4.7.5

Other specs affected:	⌘	<table border="1"><tr><td>Y</td><td>N</td></tr><tr><td>X</td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>	Y	N	X						Other core specifications	⌘ TS23.122
	Y	N										
	X											
		Test specifications										
		O&M Specifications										
Other comments:	⌘											

4.1.3.1.2 Substates of state GMM-DEREGISTERED

The GMM-DEREGISTERED state is subdivided into several substates as explained below. The substates pertain to the whole MS (ME alone if no SIM is inserted, or ME plus SIM). The selection of the appropriate substate depends on the GPRS update status, see clause 4.1.3.2, and on the selected cell.

4.1.3.1.2.1 GMM-DEREGISTERED.NORMAL-SERVICE

Valid subscriber data is available, the GPRS update status is GU1 or GU2, a cell has been selected. In this state, a request for GPRS attach is performed using the stored temporary mobile subscriber identity for GPRS (P-TMSI), routing area identification (RAI) and GPRS ciphering key sequence number in case of GU1. If the GPRS update status is GU2, the IMSI shall be used to attach for GPRS services.

4.1.3.1.2.2 GMM-DEREGISTERED.LIMITED-SERVICE

Valid subscriber data is available, GPRS update status is GU3, and a cell is selected, which is known not to be able to provide normal service.

4.1.3.1.2.3 GMM-DEREGISTERED.ATTACH-NEEDED

Valid subscriber data is available and for some reason a GPRS attach must be performed as soon as possible. This state is usually of no duration, but can last, e.g. if the access class is blocked.

4.1.3.1.2.4 GMM-DEREGISTERED.ATTEMPTING-TO-ATTACH

The GPRS update status is GU2, a cell is selected, a previous GPRS attach was rejected. The execution of further attach procedures depends on the GPRS attach attempt counter. No GMM procedure except GPRS attach shall be initiated by the MS in this substate.

4.1.3.1.2.5 GMM-DEREGISTERED.NO-IMSI

No valid subscriber data is available (no SIM, or the SIM is not considered valid by the ME) and a cell has been selected.

4.1.3.1.2.6 GMM-DEREGISTERED.NO-CELL-AVAILABLE

No cell can be selected. This substate is entered after a first intensive search failed (substate PLMN SEARCH). Cells are searched for at a low rhythm. No services are offered.

4.1.3.1.2.7 GMM-DEREGISTERED.PLMN-SEARCH

The mobile station is searching for PLMNs. This substate is left either when a cell has been selected (the new substate is NORMAL-SERVICE or LIMITED-SERVICE) or when it has been concluded that no cell is available at the moment (the new substate is NO-CELL-AVAILABLE).

4.1.3.1.2.8 GMM-DEREGISTERED.SUSPENDED (GSM only)

The MS shall enter this substate when entering dedicated mode and the MS limitations make it unable to communicate on GPRS channels. The MS shall leave this substate when leaving dedicated mode.

4.1.3.1.3 Substates of state GMM-REGISTERED

The state GMM-REGISTERED is subdivided into several substate as explained below. The substates pertain to the whole MS (ME alone if no SIM is inserted, or ME plus SIM.).

4.1.3.1.3.1 GMM-REGISTERED.NORMAL-SERVICE

User data and signalling information may be sent and received.

4.1.3.1.3.2 GMM-REGISTERED.SUSPENDED (GSM only)

The MS shall enter this substate when entering dedicated mode and when the MS limitations makes it unable to communicate on GPRS channels... In this substate, no user data should be sent and no signalling information shall be sent. The MS shall leave this substate when leaving dedicated mode.

4.1.3.1.3.3 GMM-REGISTERED.UPDATE-NEEDED

The MS has to perform a routing area updating procedure, but its access class is not allowed in the cell. The procedure will be initiated as soon as access is granted (this might be due to a cell-reselection or due to change of the access class of the current cell). No GMM procedure except routing area updating shall be initiated by the MS in this substate. In this substate, no user data and no signalling information shall be sent.

4.1.3.1.3.4 GMM-REGISTERED.ATTEMPTING-TO-UPDATE

A routing area updating procedure failed due to a missing response from the network. The MS retries the procedure controlled by timers and a GPRS attempt counter. No GMM procedure except routing area updating shall be initiated by the MS in this substate. No data shall be sent or received.

4.1.3.1.3.5 GMM-REGISTERED.NO-CELL-AVAILABLE

GPRS coverage has been lost. In this substate, the MS shall not initiate any GMM procedures except of cell (and PLMN) reselection.

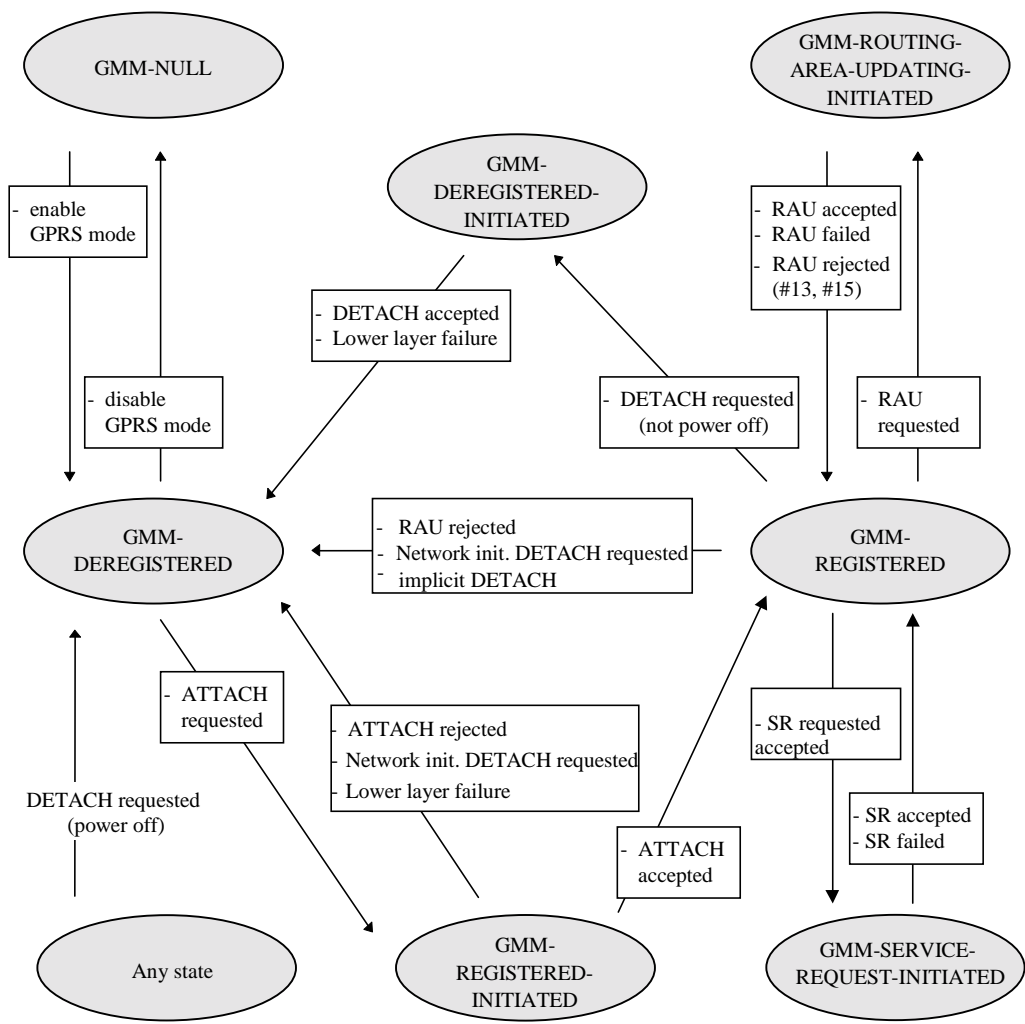


Figure 4.1b/3GPP TS 24.008:GMM main states in the MS

4.1.3.1.3.6 GMM-REGISTERED.LIMITED-SERVICE

A cell is selected, which is known not to be able to provide normal service. The MS will remain in this sub-state until a cell is selected which is able to provide normal service.

4.1.3.1.3.7 GMM-REGISTERED.ATTEMPTING-TO-UPDATE-MM

A combined routing area updating procedure or a combined GPRS attach procedure was successful for GPRS services only. The MS retries the procedure controlled by timers and a GPRS attempt counter. User data and signalling information may be sent and received.

4.1.3.1.3.8 GMM-REGISTERED.IMSI-DETACH-INITIATED

The MS performs a combined GPRS detach procedure for non-GPRS services only (detach type "IMSI Detach"). This state is entered if the MS is attached for GPRS and non-GPRS services in a network that operates in network mode I and wants to detach for non-GPRS services only. User data and signalling information may be sent and received.

4.1.3.1.3.9 GMM-REGISTERED.PLMN-SEARCH

The mobile station is searching for PLMNs. This substate is left either when a cell has been selected (the new substate is NORMAL-SERVICE or LIMITED-SERVICE) or when it has been concluded that no cell is available at the moment (the new substate is NO-CELL-AVAILABLE).

Next Modification

4.2.4 Behaviour in state GMM-DEREGISTERED

The state GMM-DEREGISTERED is entered when:

- the MS is switched on;
- the GPRS capability has been enabled in the MS;
- a GPRS detach or combined GPRS detach procedure has been performed; or
- a GMM procedure has failed (except routing area updating, see 4.7.5).

The selection of the appropriate substate of GMM-DEREGISTERED after switching on is described in clause 4.2.4.1. The specific behaviour of the MS in state GMM-DEREGISTERED is described in clause 4.2.4.2. The substate chosen when the GMM-DEREGISTERED state is returned to from another state except state GMM-NULL is described in clause 4.2.4.3.

It should be noted that transitions between the various substates of GMM-DEREGISTERED are caused by (e.g.):

- insertion or removal of the SIM;
- cell selection/reselection (see also 3GPP TS 03.22 [82]);
- PLMN search;
- loss/regain of coverage; or
- change of RA.

How various GMM procedures affect the GMM-DEREGISTERED substates and the GPRS update status is described in the detailed description of the GMM procedures in clause 4.7.

4.2.4.1 Primary substate selection

4.2.4.1.1 Selection of the substate after power on or enabling the MS's GPRS capability

When the MS is switched on, the substate shall be PLMN-SEARCH in case the SIM is inserted and valid. See 3GPP TS 23.122 [14] and 05.08 [34] for further details.

When the GPRS capability in an activated MS has been enabled, the selection of the GMM-DEREGISTERED substate depends on the MM state and the GPRS update status.

The substate chosen after PLMN-SEARCH, in case of power on or after enabling of the GPRS capability is:

- if the cell is not supporting GPRS, the substate shall be NO-CELL-AVAILABLE;
- if no SIM is present the substate shall be NO-IMSI;
- if a cell supporting GPRS has been found and the PLMN or LA is not in the forbidden list, then the substate shall be NORMAL-SERVICE;
- if the selected cell supporting GPRS is in a forbidden PLMN or a forbidden LA, then the MS shall enter the substate LIMITED-SERVICE;
- if the MS is in manual network selection mode and no cell supporting GPRS of the selected PLMN has been found, the MS shall enter the substate NO-CELL-AVAILABLE.

4.2.4.1.2 Other Cases

When the MM state is IDLE, the GMM substate PLMN-SEARCH shall also be entered in the following cases:

- when a SIM is inserted in substate NO-IMSI;
- when the user has asked for a PLMN selection in any substate except NO IMSI and NO CELL AVAILABLE ;
- when coverage is lost in any substate except NO IMSI and NO CELL AVAILABLE ;
- Roaming is denied;
- optionally, when the MS is in automatic network selection mode and the maximum allowed number of subsequently unsuccessful attach attempts controlled by the GPRS attach attempt counter (clause 4.7.3) have been performed.

~~optionally, when the MS is in automatic network selection mode and the maximum allowed number of subsequently unsuccessful routing area update attempts controlled by the GPRS routing area update attempt counter (clause 4.7.5) have been performed.~~

4.2.4.2 Detailed description of the MS behaviour in state GMM-DEREGISTERED

In state GMM-DEREGISTERED, the MS shall behave according to the substate. In the following clauses, the behaviour is described for the non transient substates.

4.2.4.2.1 Substate, NORMAL-SERVICE

The MS shall:

- perform GPRS attach.

4.2.4.2.2 Substate, ATTEMPTING-TO-ATTACH

The MS shall:

- perform GPRS attach on the expiry of timers T3311 or T3302;
- perform GPRS attach when the routing area of the serving cell has changed and the location area this cell is belonging to is not in the list of forbidden LAs;

- if entry into this state was caused by b) or d) with cause "Retry upon entry into a new cell", of clause 4.7.3.1.5 , GPRS attach shall be performed when a new cell is entered; and
- if entry into this state was caused by c) or d) with cause different from "Retry upon entry into a new cell" of clause 4.7.3.1.5, GPRS attach shall not be performed when a new cell is entered;
- use requests from CM layers to trigger the combined GPRS attach procedure, if the network operates in network operation mode I. Depending on which of the timers T3311 or T3302 is running the MS shall stop the relevant timer and act as if the stopped timer has expired.

4.2.4.2.3 Substate, LIMITED-SERVICE

The MS shall:

- perform GPRS attach when a cell is entered which may provide normal service (e.g. location area is not in one of the forbidden lists);

4.2.4.2.4 Substate, NO-IMSI

The MS shall:

- only perform default cell selection;

4.2.4.2.5 Substate, NO-CELL

The MS shall:

- perform cell selection according to 3GPP TS 03.22 [82] and shall choose an appropriate substate.

4.2.4.2.6 Substate, PLMN-SEARCH

No specific action is required in this substate.

4.2.4.2.7 Substate, ATTACH-NEEDED

The MS shall start a GPRS attach procedure if still needed as soon as the access class allows network contact in the selected cell.

4.2.4.2.8 Substate, SUSPENDED (GSM only)

The MS :

- shall not send any user data ; and
- shall not send any signalling information.

4.2.4.3 Substate when back to state GMM-DEREGISTERED from another GMM state

When returning to state GMM-DEREGISTERED, the MS shall select a cell as specified in 3GPP TS 03.22 [82].

The substate depends on the result of the cell selection procedure, the outcome of the previously performed GMM specific procedures , on the GPRS update status of the MS, on the location area data stored in the MS and on the presence of the SIM:

- if no cell has been found, the substate is NO-CELL-AVAILABLE, until a cell is found;
- if no SIM is present or if the inserted SIM is considered invalid by the MS, the substate shall be NO-IMSI;
- if the selected cell is in a location area where the MS is allowed to roam, the substate shall be NORMAL-SERVICE;

- if a GPRS attach shall be performed (e.g. network requested reattach), the substate shall be ATTEMPTING-TO-ATTACH
- if a PLMN reselection (according to 3GPP TS 23.122 [14]) is needed , the substate shall be PLMN SEARCH
- if the selected cell is in a location area where the MS is not allowed to roam, the state shall be LIMITED-SERVICE.

4.2.5 Behaviour in state GMM-REGISTERED

The state GMM-REGISTERED is entered when:

- a GMM context is established, i.e. the MS is IMSI attached for GPRS services only or for GPRS and non-GPRS services.

The specific behaviour of the MS in state GMM-REGISTERED is described in clause 4.2.5.1. The primary substate when entering the state GMM-REGISTERED is always NORMAL-SERVICE.

It should be noted that transitions between the various substates of GMM-REGISTERED are caused by (e.g.):

- cell selection/reselection (see also 3GPP TS 03.22);
- change of RA;
- loss/regain of coverage.

How various GMM procedures affect the GMM-REGISTERED substates is described in the detailed description of the procedures in clause 4.7.

4.2.5.1 Detailed description of the MS behaviour in state GMM-REGISTERED

In state GMM-REGISTERED, the MS shall behave according to the substate as explained below.

4.2.5.1.1 Substate, NORMAL-SERVICE

The MS shall:

- perform cell selection/reselection according to 3GPP TS 03.22 [82];
- perform normal and periodic routing area updating; and
- receive and transmit user data and signalling information.

GPRS MSs in operation modes C or A shall answer to paging requests.

GPRS MS in operation mode B may answer to paging requests.

4.2.5.1.2 Substate, SUSPENDED (GSM only)

The MS:

- shall not send any user data ;
- shall not send any signalling information; and
- shall not perform cell-updates.

4.2.5.1.3 Substate, UPDATE-NEEDED

The MS shall:

- not send any user data;
- not send any signalling information;

- perform cell selection/reselection according to 3GPP TS 03.22 [82]; and
- chose the appropriate new substate depending on the GPRS update status as soon as the access class allows network contact in the selected cell.

4.2.5.1.4 Substate, ATTEMPTING-TO-UPDATE

The MS:

- should not send any user data ;
- shall perform routing area update on the expiry of timers T3311 or T3302;
- shall perform routing area update when the routing area of the serving cell has changed and the location area this cell is belonging to is not in the list of forbidden LAs;
- shall if entry into this state was caused by b) or d) with cause "Retry upon entry into a new cell", of clause 4.7.5.1.5, perform routing area updating when a new cell is entered; and
- shall if entry into this state was caused by c) or d) with cause different from "Retry upon entry into a new cell" of clause 4.7.5.1.5, not perform routing area updating when a new cell is entered.
- shall use request from CM layers to trigger the combined routing area update procedure, if the network operates in network operation mode I. Depending on which of the timers T3311 or T3302 is running the MS shall stop the relevant timer and act as if the stopped timer has expired.

4.2.5.1.5 Substate, NO-CELL-AVAILABLE

The MS shall perform cell selection/reselection according to 3GPP TS 03.22 [82].

4.2.5.1.6 Substate, LIMITED-SERVICE

The MS shall perform cell selection/reselection according to 3GPP TS 03.22 [82].

4.2.5.1.7 Substate, ATTEMPTING-TO-UPDATE-MM

The MS shall:

- perform cell selection/reselection according to 3GPP TS 03.22 [82];
- receive and transmit user data and signalling information.
- perform routing area update indicating "combined RA/LA updating with IMSI attach" on the expiry of timers T3311 or T3302;
- perform routing area update indicating "combined RA/LA updating with IMSI attach" when the routing area of the serving cell has changed and the location area this cell is belonging to is not in the list of forbidden LAs;

GPRS MSs in operation modes C or A shall answer to paging requests.

GPRS MS in operation mode B may answer to paging requests.

4.2.5.1.8 Substate, PLMN-SEARCH

When the MM state is IDLE, the GMM substate PLMN-SEARCH may be entered if the MS is in automatic network selection mode and the maximum allowed number of subsequently unsuccessful routing area update attempts controlled by the GPRS routing area update attempt counter (clause 4.7.5) have been performed. If a new PLMN is selected the MS shall perform the routing area updating procedure.

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;
- 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.
- in GSM, updating the network with the new MS Radio Access Capability IE when the content of the IE has changed. Normal or combined routing area updating procedure is used.
- UMTS to GSM and for GSM to UMTS intersystem change, see clause 4.7.1.7; or
- in UMTS, to re-synchronize the PMM mode of MS and network after RRC connection release with cause "Directed signalling connection re-establishment", see clause 4.7.2.5.

The routing area updating procedure shall also be used by a MS which is attached for GPRS services if a new PLMN is entered (see 3GPP TS 23.122 [14]).

Clause 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 clause 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 clause 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 clause 4.4.1.

The Mobile Equipment shall contain a list of "equivalent PLMNs". The handling of this list is described in clause 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.

In UMTS, when a ROUTING AREA UPDATE REQUEST is received by the SGSN over a new PS signalling connection while there is an ongoing PS signalling connection (network is already in mode PMM-CONNECTED) for this UE, the network shall progress the routing area update procedure as normal and release the previous PS signalling connection when the routing area update procedure has been accepted by the network.

NOTE: The re-establishment of the radio bearers of active PDP contexts is done as described in clause "Service Request procedure".

Next Modification

4.7.5.1.5 Abnormal cases in the MS

The following abnormal cases can be identified:

- a) Access barred because of access class control

The routing area updating procedure shall not be started. The MS stays in the current serving cell and applies the normal cell reselection process. The procedure is started as soon as possible and if still necessary, i.e. when the barred state is removed or because of a cell change.

- b) Lower layer failure before the ROUTING AREA UPDATE ACCEPT or ROUTING AREA UPDATE REJECT message is received

The procedure shall be aborted. The MS shall proceed as described below.

- c) T3330 time-out

The procedure is restarted four times, i.e. on the fifth expiry of timer T3330, the MS shall abort the procedure. The MS shall proceed as described below.

- d) ROUTING AREA UPDATE REJECT, other causes than those treated in clause 4.7.5.1.4

The MS shall proceed as described below.

- e) If a routing area border is crossed, when the MS is in state GMM-ROUTING-AREA-UPDATE-INITIATED, the routing area updating procedure shall be aborted and re-initiated immediately. The MS shall set the GPRS update status to GU2 NOT UPDATED.

- f) In GSM, if a cell change occurs within the same RA, when the MS is in state GMM-ROUTING-AREA-UPDATE-INITIATED, the cell update procedure is performed, before completion of the routing area updating procedure.

- g) Routing area updating and detach procedure collision

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

If the MS receives a DETACH REQUEST message before the routing area updating procedure has been completed, the routing area updating procedure shall be aborted and the GPRS detach procedure shall be progressed.

GPRS detach containing detach type "IMSI detach":

If the MS receives a DETACH REQUEST message before the routing area updating procedure has been completed, the routing area updating procedure shall be progressed, i.e. the DETACH REQUEST message shall be ignored.

- h) Routing area updating and P-TMSI reallocation procedure collision

If the MS receives a P-TMSI REALLOCATION REQUEST message before the routing area updating procedure has been completed, the P-TMSI reallocation procedure shall be aborted and the routing area updating procedure shall be progressed.

In cases b, c and d the MS shall proceed as follows:

Timer T3330 shall be stopped if still running. The routing area updating attempt counter shall be incremented.

If the routing area updating attempt counter is less than 5, and the stored RAI is equal to the RAI of the current serving cell and the GMM update status is equal to GU1 UPDATED:

- the MS shall keep the GMM update status to GU1 UPDATED and changes state to GMM-REGISTERED.NORMAL-SERVICE. The MS shall start timer T3311. When timer T3311 expires the routing area updating procedure is triggered again.

If the routing area updating attempt counter is less than 5, and the stored RAI is different to the RAI of the current serving cell or the GMM update status is different to GU1 UPDATED:

- the MS shall start timer T3311, shall set the GPRS update status to GU2 NOT UPDATED and changes state to GMM-REGISTERED.ATTEMPTING-TO-UPDATE.
- If the routing area updating attempt counter is greater than or equal to 5:
- the MS shall start timer T3302, shall set the GPRS update status to GU2 NOT UPDATED and shall change to state GMM-REGISTERED.ATTEMPTING-TO-UPDATE or optionally to GMM-REGISTERED.PLMN-SEARCH(see 4.2.4.1-25.1.8).
- In UMTS, in case c the MS shall release the PS signaling connection and in case d the network shall release the PS signaling connection for this MS (see 3GPP TS 25.331).

CHANGE REQUEST

⌘ **24.008 CR 677** ⌘ rev **-1** ⌘ Current version: **4.7.0** ⌘

For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Routing Area Update at network change		
Source:	⌘ Orange France, Siemens AG		
Work item code:	⌘ TEI	Date:	⌘ 22/07/2002
Category:	⌘ A F	Release:	⌘ Rel-4
	<p>Use <u>one</u> of the following categories:</p> <p>F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP TR 21.900.</p>		<p>Use <u>one</u> of the following releases:</p> <p>2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) Rel-4 (Release 4) Rel-5 (Release 5) Rel-6 (Release 6)</p>

Reason for change:	⌘ Currently, in TS24.008 the behaviour of an MS attached to the packet domain is not clear when entering a new PLMN. CR 275rev2 on TS23.060 (included in SP-010706 – SA#14) clarified that Routing Area Update procedure shall be performed in such a case (and not Attach procedure).
	<u>This CR also includes correction and missing information in the current version of the specification regarding the GMM-REGISTERED.PLMN-SEARCH with is mentioned and not defined.</u>
Summary of change:	⌘ It is indicated that, to trigger the normal routing area updating to update the registration of the actual routing area of an MS in the network, the new routing area can belong to the same PLMN as the old routing area or not.
	<p><u>Corrections and missing information:</u></p> <ul style="list-style-type: none"> - <u>in §4.7.5.1.5, GMM-REGISTERED.PLMN-SEARCH is mentioned but is not defined (definition added in §4.1.3.1.3 and in §4.2.5.1)</u> - <u>in §4.7.5.1.5, reference to GMM-REGISTERED.PLMN-SEARCH section is corrected, bullet before ' If the routing area updating attempt counter is greater than or equal to 5:' is removed (not the text, just the bullet)</u> - <u>when the maximum number of RAU attempts is reached the MS shall go to PLMN-SEARCH substate within the GMM-REGISTERED state and not within the GMM-DEREGISTERED state as defined currently.</u>
Consequences if not approved:	⌘ Misalignment between Rel-4 specifications and different MS behaviours.

Clauses affected: ⌘ §. 4.1.3.1.3, §4.2.4.1.2, §4.2.5.1, §4.7.5

Other specs affected:		Y	N		
	⌘	X		Other core specifications	⌘ TS23.122
				Test specifications	
				O&M Specifications	
Other comments:	⌘				

How to create CRs using this form:

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

- 1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://ftp.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

4.1.3.1.2 Substates of state GMM-DEREGISTERED

The GMM-DEREGISTERED state is subdivided into several substates as explained below. The substates pertain to the whole MS (ME alone if no SIM is inserted, or ME plus SIM). The selection of the appropriate substate depends on the GPRS update status, see subclause 4.1.3.2, and on the selected cell.

4.1.3.1.2.1 GMM-DEREGISTERED.NORMAL-SERVICE

Valid subscriber data is available, the GPRS update status is GU1 or GU2, a cell has been selected. In this state, a request for GPRS attach is performed using the stored temporary mobile subscriber identity for GPRS (P-TMSI), routing area identification (RAI) and GPRS ciphering key sequence number in case of GU1. If the GPRS update status is GU2, the IMSI shall be used to attach for GPRS services.

4.1.3.1.2.2 GMM-DEREGISTERED.LIMITED-SERVICE

Valid subscriber data is available, GPRS update status is GU3, and a cell is selected, which is known not to be able to provide normal service.

4.1.3.1.2.3 GMM-DEREGISTERED.ATTACH-NEEDED

Valid subscriber data is available and for some reason a GPRS attach must be performed as soon as possible. This state is usually of no duration, but can last, e.g. if the access class is blocked.

4.1.3.1.2.4 GMM-DEREGISTERED.ATTEMPTING-TO-ATTACH

The GPRS update status is GU2, a cell is selected, a previous GPRS attach was rejected. The execution of further attach procedures depends on the GPRS attach attempt counter. No GMM procedure except GPRS attach shall be initiated by the MS in this substate.

4.1.3.1.2.5 GMM-DEREGISTERED.NO-IMSI

No valid subscriber data is available (no SIM, or the SIM is not considered valid by the ME) and a cell has been selected.

4.1.3.1.2.6 GMM-DEREGISTERED.NO-CELL-AVAILABLE

No cell can be selected. This substate is entered after a first intensive search failed (substate PLMN SEARCH). Cells are searched for at a low rhythm. No services are offered.

4.1.3.1.2.7 GMM-DEREGISTERED.PLMN-SEARCH

The mobile station is searching for PLMNs. This substate is left either when a cell has been selected (the new substate is NORMAL-SERVICE or LIMITED-SERVICE) or when it has been concluded that no cell is available at the moment (the new substate is NO-CELL-AVAILABLE).

4.1.3.1.2.8 GMM-DEREGISTERED.SUSPENDED (GSM only)

The MS shall enter this substate when entering dedicated mode and the MS limitations make it unable to communicate on GPRS channels. The MS shall leave this substate when leaving dedicated mode.

4.1.3.1.3 Substates of state GMM-REGISTERED

The state GMM-REGISTERED is subdivided into several substate as explained below. The substates pertain to the whole MS (ME alone if no SIM is inserted, or ME plus SIM.).

4.1.3.1.3.1 GMM-REGISTERED.NORMAL-SERVICE

User data and signalling information may be sent and received.

4.1.3.1.3.2 GMM-REGISTERED.SUSPENDED (GSM only)

The MS shall enter this substate when entering dedicated mode and when the MS limitations makes it unable to communicate on GPRS channels... In this substate, no user data should be sent and no signalling information shall be sent. The MS shall leave this substate when leaving dedicated mode.

4.1.3.1.3.3 GMM-REGISTERED.UPDATE-NEEDED

The MS has to perform a routing area updating procedure, but its access class is not allowed in the cell. The procedure will be initiated as soon as access is granted (this might be due to a cell-reselection or due to change of the access class of the current cell). No GMM procedure except routing area updating shall be initiated by the MS in this substate. In this substate, no user data and no signalling information shall be sent.

4.1.3.1.3.4 GMM-REGISTERED.ATTEMPTING-TO-UPDATE

A routing area updating procedure failed due to a missing response from the network. The MS retries the procedure controlled by timers and a GPRS attempt counter. No GMM procedure except routing area updating shall be initiated by the MS in this substate. No data shall be sent or received.

4.1.3.1.3.5 GMM-REGISTERED.NO-CELL-AVAILABLE

GPRS coverage has been lost. In this substate, the MS shall not initiate any GMM procedures except of cell (and PLMN) reselection.

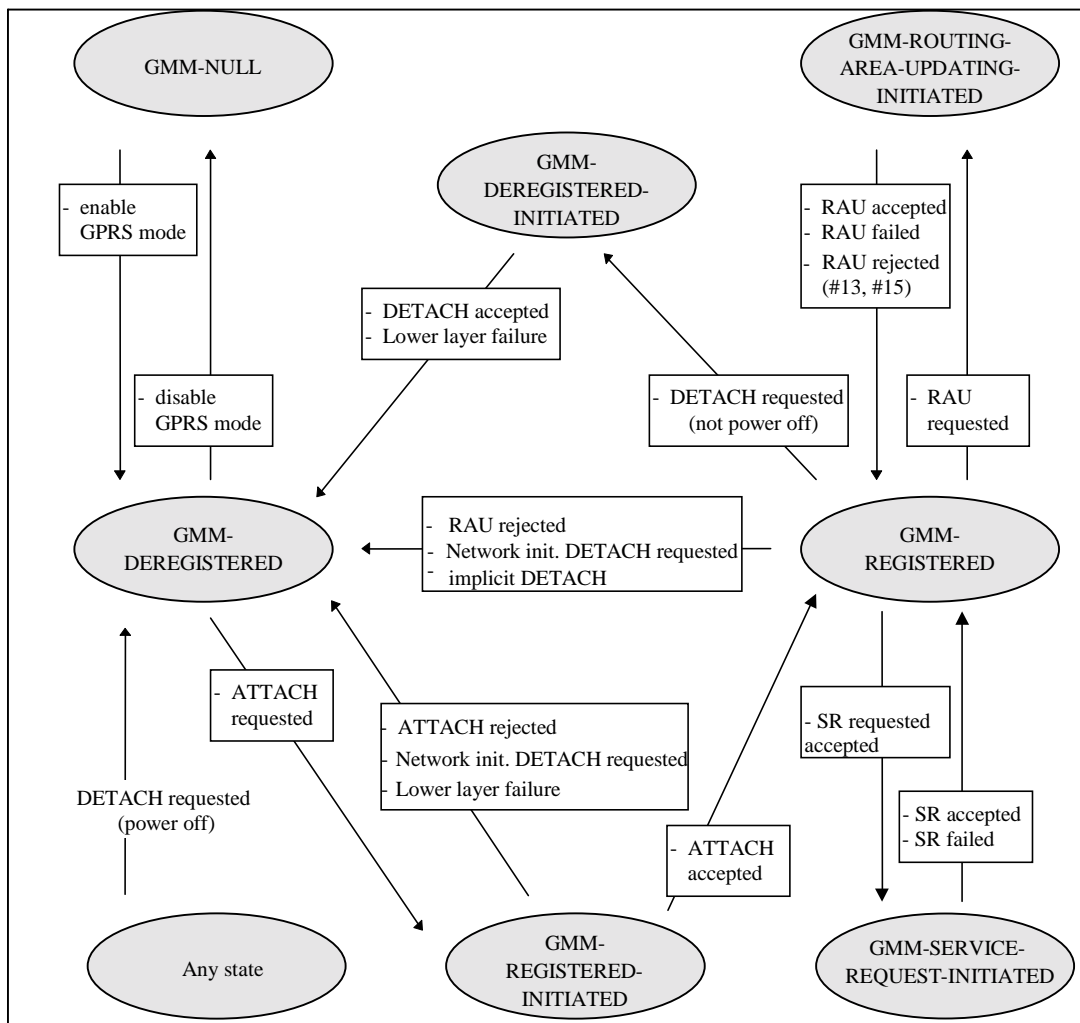


Figure 4.1b/3GPP TS 24.008:GMM main states in the MS

4.1.3.1.3.6 GMM-REGISTERED.LIMITED-SERVICE

A cell is selected, which is known not to be able to provide normal service. The MS will remain in this sub-state until a cell is selected which is able to provide normal service.

4.1.3.1.3.7 GMM-REGISTERED.ATTEMPTING-TO-UPDATE-MM

A combined routing area updating procedure or a combined GPRS attach procedure was successful for GPRS services only. The MS retries the procedure controlled by timers and a GPRS attempt counter. User data and signalling information may be sent and received.

4.1.3.1.3.8 GMM-REGISTERED.IMSI-DETACH-INITIATED

The MS performs a combined GPRS detach procedure for non-GPRS services only (detach type "IMSI Detach"). This state is entered if the MS is attached for GPRS and non-GPRS services in a network that operates in network mode I and wants to detach for non-GPRS services only. User data and signalling information may be sent and received.

4.1.3.1.3.9 GMM-REGISTERED.PLMN-SEARCH

The mobile station is searching for PLMNs. This substate is left either when a cell has been selected (the new substate is NORMAL-SERVICE or LIMITED-SERVICE) or when it has been concluded that no cell is available at the moment (the new substate is NO-CELL-AVAILABLE).

*****NEXT CHANGES*****

4.2.4 Behaviour in state GMM-DEREGISTERED

The state GMM-DEREGISTERED is entered when:

- the MS is switched on;
- the GPRS capability has been enabled in the MS;
- a GPRS detach or combined GPRS detach procedure has been performed; or
- a GMM procedure has failed (except routing area updating, see subclause 4.7.5).

The selection of the appropriate substate of GMM-DEREGISTERED after switching on is described in subclause 4.2.4.1. The specific behaviour of the MS in state GMM-DEREGISTERED is described in subclause 4.2.4.2. The substate chosen when the GMM-DEREGISTERED state is returned to from another state except state GMM-NULL is described in subclause 4.2.4.3.

It should be noted that transitions between the various substates of GMM-DEREGISTERED are caused by (e.g.):

- insertion or removal of the SIM;
- cell selection/reselection (see also 3GPP TS 43.022 [82]);
- PLMN search;
- loss/regain of coverage; or
- change of RA.

How various GMM procedures affect the GMM-DEREGISTERED substates and the GPRS update status is described in the detailed description of the GMM procedures in subclause 4.7.

4.2.4.1 Primary substate selection

4.2.4.1.1 Selection of the substate after power on or enabling the MS's GPRS capability

When the MS is switched on, the substate shall be PLMN-SEARCH in case the SIM is inserted and valid. See 3GPP TS 23.122 [14] and 3GPP TS 45.008 [34] for further details.

When the GPRS capability in an activated MS has been enabled, the selection of the GMM-DEREGISTERED substate depends on the MM state and the GPRS update status.

The substate chosen after PLMN-SEARCH, in case of power on or after enabling of the GPRS capability is:

- if the cell is not supporting GPRS, the substate shall be NO-CELL-AVAILABLE;
- if no SIM is present the substate shall be NO-IMSI;
- if a cell supporting GPRS has been found and the PLMN or LA is not in the forbidden list, then the substate shall be NORMAL-SERVICE;
- if the selected cell supporting GPRS is in a forbidden PLMN or a forbidden LA, then the MS shall enter the substate LIMITED-SERVICE;
- if the MS is in manual network selection mode and no cell supporting GPRS of the selected PLMN has been found, the MS shall enter the substate NO-CELL-AVAILABLE.

4.2.4.1.2 Other Cases

When the MM state is IDLE, the GMM substate PLMN-SEARCH shall also be entered in the following cases:

- when a SIM is inserted in substate NO-IMSI;
- when the user has asked for a PLMN selection in any substate except NO IMSI and NO CELL AVAILABLE ;
- when coverage is lost in any substate except NO IMSI and NO CELL AVAILABLE ;
- Roaming is denied;
- optionally, when the MS is in automatic network selection mode and the maximum allowed number of subsequently unsuccessful attach attempts controlled by the GPRS attach attempt counter (subclause 4.7.3) have been performed.

~~optionally, when the MS is in automatic network selection mode and the maximum allowed number of subsequently unsuccessful routing area update attempts controlled by the GPRS routing area update attempt counter (subclause 4.7.5) have been performed.~~

4.2.4.2 Detailed description of the MS behaviour in state GMM-DEREGISTERED

In state GMM-DEREGISTERED, the MS shall behave according to the substate. In the following subclauses, the behaviour is described for the non transient substates.

4.2.4.2.1 Substate, NORMAL-SERVICE

The MS shall:

- perform GPRS attach.

4.2.4.2.2 Substate, ATTEMPTING-TO-ATTACH

The MS shall:

- perform GPRS attach on the expiry of timers T3311 or T3302;
- perform GPRS attach when the routing area of the serving cell has changed and the location area this cell is belonging to is not in the list of forbidden LAs;
- if entry into this state was caused by b) or d) with cause "Retry upon entry into a new cell" of subclause 4.7.3.1.5, GPRS attach shall be performed when a new cell is entered;
- if entry into this state was caused by c) or d) with cause different from "Retry upon entry into a new cell" of subclause 4.7.3.1.5, GPRS attach shall not be performed when a new cell is entered; and

- use requests from CM layers to trigger the combined GPRS attach procedure, if the network operates in network operation mode I. Depending on which of the timers T3311 or T3302 is running the MS shall stop the relevant timer and act as if the stopped timer has expired.

4.2.4.2.3 Substate, LIMITED-SERVICE

The MS shall:

- perform GPRS attach when a cell is entered which may provide normal service (e.g. location area is not in one of the forbidden lists).

4.2.4.2.4 Substate, NO-IMSI

The MS shall:

- only perform default cell selection.

4.2.4.2.5 Substate, NO-CELL

The MS shall:

- perform cell selection according to 3GPP TS 43.022 [82] and shall choose an appropriate substate.

4.2.4.2.6 Substate, PLMN-SEARCH

No specific action is required in this substate.

4.2.4.2.7 Substate, ATTACH-NEEDED

The MS shall start a GPRS attach procedure if still needed as soon as the access class allows network contact in the selected cell.

4.2.4.2.8 Substate, SUSPENDED (GSM only)

The MS:

- shall not send any user data; and
- shall not send any signalling information.

4.2.4.3 Substate when back to state GMM-DEREGISTERED from another GMM state

When returning to state GMM-DEREGISTERED, the MS shall select a cell as specified in 3GPP TS 43.022 [82].

The substate depends on the result of the cell selection procedure, the outcome of the previously performed GMM specific procedures, on the GPRS update status of the MS, on the location area data stored in the MS and on the presence of the SIM:

- if no cell has been found, the substate is NO-CELL-AVAILABLE, until a cell is found;
- if no SIM is present or if the inserted SIM is considered invalid by the MS, the substate shall be NO-IMSI;
- if the selected cell is in a location area where the MS is allowed to roam, the substate shall be NORMAL-SERVICE;
- if a GPRS attach shall be performed (e.g. network requested reattach), the substate shall be ATTEMPTING-TO-ATTACH
- if a PLMN reselection (according to 3GPP TS 23.122 [14]) is needed, the substate shall be PLMN SEARCH
- if the selected cell is in a location area where the MS is not allowed to roam, the state shall be LIMITED-SERVICE.

4.2.5 Behaviour in state GMM-REGISTERED

The state GMM-REGISTERED is entered when:

- a GMM context is established, i.e. the MS is IMSI attached for GPRS services only or for GPRS and non-GPRS services.

The specific behaviour of the MS in state GMM-REGISTERED is described in subclause 4.2.5.1. The primary substate when entering the state GMM-REGISTERED is always NORMAL-SERVICE.

It should be noted that transitions between the various substates of GMM-REGISTERED are caused by (e.g.):

- cell selection/reselection (see also 3GPP TS 43.022 [82]);
- change of RA;
- loss/regain of coverage.

How various GMM procedures affect the GMM-REGISTERED substates is described in the detailed description of the procedures in subclause 4.7.

4.2.5.1 Detailed description of the MS behaviour in state GMM-REGISTERED

In state GMM-REGISTERED, the MS shall behave according to the substate as explained below.

4.2.5.1.1 Substate, NORMAL-SERVICE

The MS shall:

- perform cell selection/reselection according to 3GPP TS 43.022 [82];
- perform normal and periodic routing area updating; and
- receive and transmit user data and signalling information.

GPRS MSs in operation modes C or A shall answer to paging requests.

GPRS MS in operation mode B may answer to paging requests.

4.2.5.1.2 Substate, SUSPENDED (GSM only)

The MS:

- shall not send any user data;
- shall not send any signalling information; and
- shall not perform cell-updates.

4.2.5.1.3 Substate, UPDATE-NEEDED

The MS shall:

- not send any user data;
- not send any signalling information;
- perform cell selection/reselection according to 3GPP TS 43.022 [82]; and
- chose the appropriate new substate depending on the GPRS update status as soon as the access class allows network contact in the selected cell.

4.2.5.1.4 Substate, ATTEMPTING-TO-UPDATE

The MS:

- should not send any user data;
- shall perform routing area update on the expiry of timers T3311 or T3302;
- shall perform routing area update when the routing area of the serving cell has changed and the location area this cell is belonging to is not in the list of forbidden LAs;
- shall if entry into this state was caused by b) or d) with cause "Retry upon entry into a new cell", of subclause 4.7.5.1.5, perform routing area updating when a new cell is entered;
- shall if entry into this state was caused by c) or d) with cause different from "Retry upon entry into a new cell" of subclause 4.7.5.1.5, not perform routing area updating when a new cell is entered; and
- shall use request from CM layers to trigger the combined routing area update procedure, if the network operates in network operation mode I. Depending on which of the timers T3311 or T3302 is running the MS shall stop the relevant timer and act as if the stopped timer has expired.

4.2.5.1.5 Substate, NO-CELL-AVAILABLE

The MS shall perform cell selection/reselection according to 3GPP TS 43.022 [82].

4.2.5.1.6 Substate, LIMITED-SERVICE

The MS shall perform cell selection/reselection according to 3GPP TS 43.022 [82];

4.2.5.1.7 Substate, ATTEMPTING-TO-UPDATE-MM

The MS shall:

- perform cell selection/reselection according to 3GPP TS 43.022 [82];
- receive and transmit user data and signalling information;
- perform routing area update indicating "combined RA/LA updating with IMSI attach" on the expiry of timers T3311 or T3302;
- perform routing area update indicating "combined RA/LA updating with IMSI attach" when the routing area of the serving cell has changed and the location area this cell is belonging to is not in the list of forbidden LAs.

GPRS MSs in operation modes C or A shall answer to paging requests.

GPRS MS in operation mode B may answer to paging requests.

4.2.5.1.8 Substate, PLMN-SEARCH

When the MM state is IDLE, the GMM substate PLMN-SEARCH may be entered if the MS is in automatic network selection mode and the maximum allowed number of subsequently unsuccessful routing area update attempts controlled by the GPRS routing area update attempt counter (clause 4.7.5) have been performed. If a new PLMN is selected the MS shall perform the routing area updating procedure.

*****NEXT CHANGES*****

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;
- 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 3GPP TS 44.018 [84];
 - in GSM, updating the network with the new MS Radio Access Capability IE when the content of the IE has changed. Normal or combined routing area updating procedure is used.;
- UMTS to GSM and for GSM to UMTS intersystem change, see subclause 4.7.1.7; or
- in UMTS, to re-synchronize the PMM mode of MS and network after RRC connection release with cause "Directed signalling connection re-establishment", see subclause 4.7.2.5.

The routing area updating procedure shall also be used by a MS which is attached for GPRS services if a new PLMN is entered (see 3GPP TS 23.122 [14]).

Subclause 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 subclause 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 subclause 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 subclause 4.4.1.

The Mobile Equipment shall contain a list of "equivalent PLMNs". The handling of this list is described in subclause 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.

In UMTS, when a ROUTING AREA UPDATE REQUEST is received by the SGSN over a new PS signalling connection while there is an ongoing PS signalling connection (network is already in mode PMM-CONNECTED) for this UE, the network shall progress the routing area update procedure as normal and release the previous PS signalling connection when the routing area update procedure has been accepted by the network.

NOTE: The re-establishment of the radio bearers of active PDP contexts is done as described in subclause "Service Request procedure".

The network informs the MS about the support of specific features, such as LCS-MOLR, in the "Network feature support" Information Element. The information is either explicitly given by sending the "Network feature support" IE or implicitly by not sending it. The handling in the network is described in subclause 9.4.15.11. The MS may use the indication to inform the user about the availability of the appropriate services and it shall not request services that have not been indicated as available.

*****NEXT CHANGES*****

4.7.5.1.5 Abnormal cases in the MS

The following abnormal cases can be identified:

- a) Access barred because of access class control

The routing area updating procedure shall not be started. The MS stays in the current serving cell and applies the normal cell reselection process. The procedure is started as soon as possible and if still necessary, i.e. when the barred state is removed or because of a cell change.

- b) Lower layer failure before the ROUTING AREA UPDATE ACCEPT or ROUTING AREA UPDATE REJECT message is received

The procedure shall be aborted. The MS shall proceed as described below.

- c) T3330 time-out

The procedure is restarted four times, i.e. on the fifth expiry of timer T3330, the MS shall abort the procedure. The MS shall proceed as described below.

- d) ROUTING AREA UPDATE REJECT, other causes than those treated in subclause 4.7.5.1.4

The MS shall proceed as described below.

- e) If a routing area border is crossed, when the MS is in state GMM-ROUTING-AREA-UPDATE-INITIATED, the routing area updating procedure shall be aborted and re-initiated immediately. The MS shall set the GPRS update status to GU2 NOT UPDATED.

- f) In GSM, if a cell change occurs within the same RA, when the MS is in state GMM-ROUTING-AREA-UPDATE-INITIATED, the cell update procedure is performed, before completion of the routing area updating procedure.

- g) Routing area updating and detach procedure collision

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

If the MS receives a DETACH REQUEST message before the routing area updating procedure has been completed, the routing area updating procedure shall be aborted and the GPRS detach procedure shall be progressed.

GPRS detach containing detach type "IMSI detach":

If the MS receives a DETACH REQUEST message before the routing area updating procedure has been completed, the routing area updating procedure shall be progressed, i.e. the DETACH REQUEST message shall be ignored.

- h) Routing area updating and P-TMSI reallocation procedure collision

If the MS receives a P-TMSI REALLOCATION REQUEST message before the routing area updating procedure has been completed, the P-TMSI reallocation procedure shall be aborted and the routing area updating procedure shall be progressed.

In cases b, c and d the MS shall proceed as follows:

Timer T3330 shall be stopped if still running. The routing area updating attempt counter shall be incremented.

If the routing area updating attempt counter is less than 5, and the stored RAI is equal to the RAI of the current serving cell and the GMM update status is equal to GU1 UPDATED:

- the MS shall keep the GMM update status to GU1 UPDATED and changes state to GMM-REGISTERED.NORMAL-SERVICE. The MS shall start timer T3311. When timer T3311 expires the routing area updating procedure is triggered again.

If the routing area updating attempt counter is less than 5, and the stored RAI is different to the RAI of the current serving cell or the GMM update status is different to GU1 UPDATED:

- the MS shall start timer T3311, shall set the GPRS update status to GU2 NOT UPDATED and changes state to GMM-REGISTERED.ATTEMPTING-TO-UPDATE.
- If the routing area updating attempt counter is greater than or equal to 5:
 - the MS shall start timer T3302, shall set the GPRS update status to GU2 NOT UPDATED and shall change to state GMM-REGISTERED.ATTEMPTING-TO-UPDATE or optionally to GMM-REGISTERED.PLMN-SEARCH(see subclause 4.2.4.1.25.1.8).
- In UMTS, in case c the MS shall release the PS signaling connection and in case d the network shall release the PS signaling connection for this MS (see 3GPP TS 25.331 [23c]).

CHANGE REQUEST

⌘ **24.008 CR 678** ⌘ rev **-1** ⌘ Current version: **5.4.0** ⌘

For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Routing Area Update at network change		
Source:	⌘ Orange France, Siemens AG		
Work item code:	⌘ TEI	Date:	⌘ 22/07/2002
Category:	⌘ A F	Release:	⌘ Rel-5
	Use <u>one</u> of the following categories: F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.		Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) Rel-4 (Release 4) Rel-5 (Release 5) Rel-6 (Release 6)

Reason for change:	⌘ Currently, in TS24.008 the behaviour of an MS attached to the packet domain is not clear when entering a new PLMN. CR 275rev2 on TS23.060 (included in SP-010706 – SA#14) clarified that Routing Area Update procedure shall be performed in such a case (and not Attach procedure). This CR also includes correction and missing information in the current version of the specification regarding the GMM-REGISTERED.PLMN-SEARCH with is mentioned and not defined.
Summary of change:	⌘ It is indicated that, to trigger the normal routing area updating to update the registration of the actual routing area of an MS in the network, the new routing area can belong to the same PLMN as the old routing area or not. <u>Corrections and missing information:</u> - in §4.7.5.1.5, GMM-REGISTERED.PLMN-SEARCH is mentioned but is not defined (definition added in §4.1.3.1.3 and in §4.2.5.1) - in §4.7.5.1.5, reference to GMM-REGISTERED.PLMN-SEARCH section is corrected, - when the maximum number of RAU attempts is reached the MS shall go to PLMN-SEARCH substate within the GMM-REGISTERED state and not within the GMM-DEREGISTERED state as defined currently.
Consequences if not approved:	⌘ Misalignment between Rel-5 specifications and different MS behaviours.

Clauses affected: ⌘ §, 4.1.3.1.3, §4.2.4.1.2, §4.2.5.1, §4.7.5

Other specs affected:		Y	N		
	⌘	X		Other core specifications	⌘ TS23.122
				Test specifications	
				O&M Specifications	
Other comments:	⌘				

How to create CRs using this form:

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

- 1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://ftp.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

4.1.3.1.2 Substates of state GMM-DEREGISTERED

The GMM-DEREGISTERED state is subdivided into several substates as explained below. The substates pertain to the whole MS (ME alone if no SIM is inserted, or ME plus SIM). The selection of the appropriate substate depends on the GPRS update status, see subclause 4.1.3.2, and on the selected cell.

4.1.3.1.2.1 GMM-DEREGISTERED.NORMAL-SERVICE

Valid subscriber data is available, the GPRS update status is GU1 or GU2, a cell has been selected. In this state, a request for GPRS attach is performed using the stored temporary mobile subscriber identity for GPRS (P-TMSI), routing area identification (RAI) and GPRS ciphering key sequence number in case of GU1. If the GPRS update status is GU2, the IMSI shall be used to attach for GPRS services.

4.1.3.1.2.2 GMM-DEREGISTERED.LIMITED-SERVICE

Valid subscriber data is available, GPRS update status is GU3, and a cell is selected, which is known not to be able to provide normal service.

4.1.3.1.2.3 GMM-DEREGISTERED.ATTACH-NEEDED

Valid subscriber data is available and for some reason a GPRS attach must be performed as soon as possible. This state is usually of no duration, but can last, e.g. if the access class is blocked.

4.1.3.1.2.4 GMM-DEREGISTERED.ATTEMPTING-TO-ATTACH

The GPRS update status is GU2, a cell is selected, a previous GPRS attach was rejected. The execution of further attach procedures depends on the GPRS attach attempt counter. No GMM procedure except GPRS attach shall be initiated by the MS in this substate.

4.1.3.1.2.5 GMM-DEREGISTERED.NO-IMSI

No valid subscriber data is available (no SIM, or the SIM is not considered valid by the ME) and a cell has been selected.

4.1.3.1.2.6 GMM-DEREGISTERED.NO-CELL-AVAILABLE

No cell can be selected. This substate is entered after a first intensive search failed (substate PLMN SEARCH). Cells are searched for at a low rhythm. No services are offered.

4.1.3.1.2.7 GMM-DEREGISTERED.PLMN-SEARCH

The mobile station is searching for PLMNs. This substate is left either when a cell has been selected (the new substate is NORMAL-SERVICE or LIMITED-SERVICE) or when it has been concluded that no cell is available at the moment (the new substate is NO-CELL-AVAILABLE).

4.1.3.1.2.8 GMM-DEREGISTERED.SUSPENDED (GSM only)

The MS shall enter this substate when entering dedicated mode and the MS limitations make it unable to communicate on GPRS channels. The MS shall leave this substate when leaving dedicated mode.

4.1.3.1.3 Substates of state GMM-REGISTERED

The state GMM-REGISTERED is subdivided into several substate as explained below. The substates pertain to the whole MS (ME alone if no SIM is inserted, or ME plus SIM.).

4.1.3.1.3.1 GMM-REGISTERED.NORMAL-SERVICE

User data and signalling information may be sent and received.

4.1.3.1.3.2 GMM-REGISTERED.SUSPENDED (GSM only)

The MS shall enter this substate when entering dedicated mode and when the MS limitations makes it unable to communicate on GPRS channels... In this substate, no user data should be sent and no signalling information shall be sent. The MS shall leave this substate when leaving dedicated mode.

4.1.3.1.3.3 GMM-REGISTERED.UPDATE-NEEDED

The MS has to perform a routing area updating procedure, but its access class is not allowed in the cell. The procedure will be initiated as soon as access is granted (this might be due to a cell-reselection or due to change of the access class of the current cell). No GMM procedure except routing area updating shall be initiated by the MS in this substate. In this substate, no user data and no signalling information shall be sent.

4.1.3.1.3.4 GMM-REGISTERED.ATTEMPTING-TO-UPDATE

A routing area updating procedure failed due to a missing response from the network. The MS retries the procedure controlled by timers and a GPRS attempt counter. No GMM procedure except routing area updating shall be initiated by the MS in this substate. No data shall be sent or received.

4.1.3.1.3.5 GMM-REGISTERED.NO-CELL-AVAILABLE

GPRS coverage has been lost. In this substate, the MS shall not initiate any GMM procedures except of cell (and PLMN) reselection.

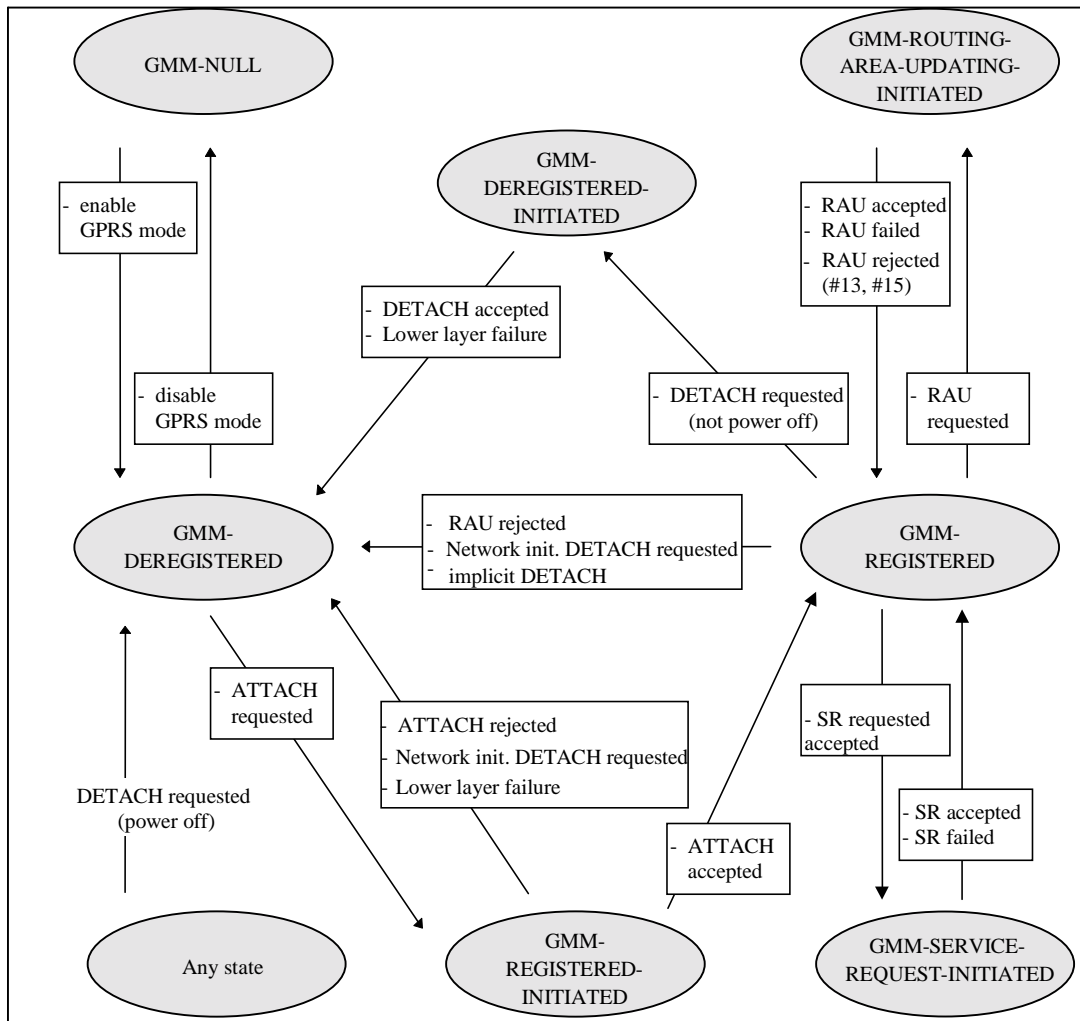


Figure 4.1b/3GPP TS 24.008:GMM main states in the MS

4.1.3.1.3.6 GMM-REGISTERED.LIMITED-SERVICE

A cell is selected, which is known not to be able to provide normal service. The MS will remain in this sub-state until a cell is selected which is able to provide normal service.

4.1.3.1.3.7 GMM-REGISTERED.ATTEMPTING-TO-UPDATE-MM

A combined routing area updating procedure or a combined GPRS attach procedure was successful for GPRS services only. The MS retries the procedure controlled by timers and a GPRS attempt counter. User data and signalling information may be sent and received.

4.1.3.1.3.8 GMM-REGISTERED.IMSI-DETACH-INITIATED

The MS performs a combined GPRS detach procedure for non-GPRS services only (detach type "IMSI Detach"). This state is entered if the MS is attached for GPRS and non-GPRS services in a network that operates in network mode I and wants to detach for non-GPRS services only. User data and signalling information may be sent and received.

4.1.3.1.3.9 GMM-REGISTERED.PLMN-SEARCH

The mobile station is searching for PLMNs. This substate is left either when a cell has been selected (the new substate is NORMAL-SERVICE or LIMITED-SERVICE) or when it has been concluded that no cell is available at the moment (the new substate is NO-CELL-AVAILABLE).

*****NEXT MODIFICATION*****

4.2.4 Behaviour in state GMM-DEREGISTERED

The state GMM-DEREGISTERED is entered when:

- the MS is switched on;
- the GPRS capability has been enabled in the MS;
- a GPRS detach or combined GPRS detach procedure has been performed; or
- a GMM procedure has failed (except routing area updating, see subclause 4.7.5).

The selection of the appropriate substate of GMM-DEREGISTERED after switching on is described in subclause 4.2.4.1. The specific behaviour of the MS in state GMM-DEREGISTERED is described in subclause 4.2.4.2. The substate chosen when the GMM-DEREGISTERED state is returned to from another state except state GMM-NONE is described in subclause 4.2.4.3.

It should be noted that transitions between the various substates of GMM-DEREGISTERED are caused by (e.g.):

- insertion or removal of the SIM;
- cell selection/reselection (see also 3GPP TS 43.022 [82] and 3GPP TS 25.304 [98]);
- PLMN search;
- loss/regain of coverage; or
- change of RA.

How various GMM procedures affect the GMM-DEREGISTERED substates and the GPRS update status is described in the detailed description of the GMM procedures in subclause 4.7.

4.2.4.1 Primary substate selection

4.2.4.1.1 Selection of the substate after power on or enabling the MS's GPRS capability

When the MS is switched on, the substate shall be PLMN-SEARCH in case the SIM is inserted and valid. See 3GPP TS 23.122 [14] and 3GPP TS 45.008 [34] for further details.

When the GPRS capability in an activated MS has been enabled, the selection of the GMM-DEREGISTERED substate depends on the MM state and the GPRS update status.

The substate chosen after PLMN-SEARCH, in case of power on or after enabling of the GPRS capability is:

- if the cell is not supporting GPRS, the substate shall be NO-CELL-AVAILABLE;
- if no SIM is present the substate shall be NO-IMSI;
- if a cell supporting GPRS has been found and the PLMN or LA is not in the forbidden list, then the substate shall be NORMAL-SERVICE;
- if the selected cell supporting GPRS is in a forbidden PLMN or a forbidden LA, then the MS shall enter the substate LIMITED-SERVICE;
- if the MS is in manual network selection mode and no cell supporting GPRS of the selected PLMN has been found, the MS shall enter the substate NO-CELL-AVAILABLE.

4.2.4.1.2 Other Cases

When the MM state is IDLE, the GMM substate PLMN-SEARCH shall also be entered in the following cases:

- when a SIM is inserted in substate NO-IMSI;
- when the user has asked for a PLMN selection in any substate except NO IMSI and NO CELL AVAILABLE ;
- when coverage is lost in any substate except NO IMSI and NO CELL AVAILABLE ;
- Roaming is denied;
- optionally, when the MS is in automatic network selection mode and the maximum allowed number of subsequently unsuccessful attach attempts controlled by the GPRS attach attempt counter (subclause 4.7.3) have been performed.

~~optionally, when the MS is in automatic network selection mode and the maximum allowed number of subsequently unsuccessful routing area update attempts controlled by the GPRS routing area update attempt counter (subclause 4.7.5) have been performed.~~

4.2.4.2 Detailed description of the MS behaviour in state GMM-DEREGISTERED

In state GMM-DEREGISTERED, the MS shall behave according to the substate. In the following subclauses, the behaviour is described for the non transient substates.

4.2.4.2.1 Substate, NORMAL-SERVICE

The MS shall:

- perform GPRS attach.

4.2.4.2.2 Substate, ATTEMPTING-TO-ATTACH

The MS shall:

- perform GPRS attach on the expiry of timers T3311 or T3302;
- perform GPRS attach when the routing area of the serving cell has changed and the location area this cell is belonging to is not in the list of forbidden LAs;

- if entry into this state was caused by b) or d) with cause "Retry upon entry into a new cell" of subclause 4.7.3.1.5, GPRS attach shall be performed when a new cell is entered;
- if entry into this state was caused by c) or d) with cause different from "Retry upon entry into a new cell" of subclause 4.7.3.1.5, GPRS attach shall not be performed when a new cell is entered; and
- use requests from CM layers to trigger the combined GPRS attach procedure, if the network operates in network operation mode I. Depending on which of the timers T3311 or T3302 is running the MS shall stop the relevant timer and act as if the stopped timer has expired.

4.2.4.2.3 Substate, LIMITED-SERVICE

The MS shall:

- perform GPRS attach when a cell is entered which may provide normal service (e.g. location area is not in one of the forbidden lists).

4.2.4.2.4 Substate, NO-IMSI

The MS shall:

- only perform default cell selection.

4.2.4.2.5 Substate, NO-CELL

The MS shall:

- perform cell selection according to 3GPP TS 43.022 [82] and 3GPP TS 25.304 [98] and shall choose an appropriate substate.

4.2.4.2.6 Substate, PLMN-SEARCH

No specific action is required in this substate.

4.2.4.2.7 Substate, ATTACH-NEEDED

The MS shall start a GPRS attach procedure if still needed as soon as the access class allows network contact in the selected cell.

4.2.4.2.8 Substate, SUSPENDED (GSM only)

The MS:

- shall not send any user data; and
- shall not send any signalling information.

4.2.4.3 Substate when back to state GMM-DEREGISTERED from another GMM state

When returning to state GMM-DEREGISTERED, the MS shall select a cell as specified in 3GPP TS 43.022 [82] and 3GPP TS 25.304 [98].

The substate depends on the result of the cell selection procedure, the outcome of the previously performed GMM specific procedures, on the GPRS update status of the MS, on the location area data stored in the MS and on the presence of the SIM:

- if no cell has been found, the substate is NO-CELL-AVAILABLE, until a cell is found;
- if no SIM is present or if the inserted SIM is considered invalid by the MS, the substate shall be NO-IMSI;

- if the selected cell is in a location area where the MS is allowed to roam, the substate shall be NORMAL-SERVICE;
- if a GPRS attach shall be performed (e.g. network requested reattach), the substate shall be ATTEMPTING-TO-ATTACH
- if a PLMN reselection (according to 3GPP TS 23.122 [14]) is needed, the substate shall be PLMN SEARCH
- if the selected cell is in a location area where the MS is not allowed to roam, the state shall be LIMITED-SERVICE.

4.2.5 Behaviour in state GMM-REGISTERED

The state GMM-REGISTERED is entered when:

- a GMM context is established, i.e. the MS is IMSI attached for GPRS services only or for GPRS and non-GPRS services.

The specific behaviour of the MS in state GMM-REGISTERED is described in subclause 4.2.5.1. The primary substate when entering the state GMM-REGISTERED is always NORMAL-SERVICE.

It should be noted that transitions between the various substates of GMM-REGISTERED are caused by (e.g.):

- cell selection/reselection (see also 3GPP TS 43.022 [82] and 3GPP TS 25.304 [98]);
- change of RA;
- loss/regain of coverage.

How various GMM procedures affect the GMM-REGISTERED substates is described in the detailed description of the procedures in subclause 4.7.

4.2.5.1 Detailed description of the MS behaviour in state GMM-REGISTERED

In state GMM-REGISTERED, the MS shall behave according to the substate as explained below.

4.2.5.1.1 Substate, NORMAL-SERVICE

The MS shall:

- perform cell selection/reselection according to 3GPP TS 43.022 [82] and 3GPP TS 25.304 [98];
- perform normal and periodic routing area updating; and
- receive and transmit user data and signalling information.

GPRS MSs in operation modes C or A shall answer to paging requests.

GPRS MS in operation mode B may answer to paging requests.

4.2.5.1.2 Substate, SUSPENDED (GSM only)

The MS:

- shall not send any user data;
- shall not send any signalling information; and
- shall not perform cell-updates.

4.2.5.1.3 Substate, UPDATE-NEEDED

The MS shall:

- not send any user data;
- not send any signalling information;
- perform cell selection/reselection according to 3GPP TS 43.022 [82] and 3GPP TS 25.304 [98]; and
- chose the appropriate new substate depending on the GPRS update status as soon as the access class allows network contact in the selected cell.

4.2.5.1.4 Substate, ATTEMPTING-TO-UPDATE

The MS:

- should not send any user data;
- shall perform routing area update on the expiry of timers T3311 or T3302;
- shall perform routing area update when the routing area of the serving cell has changed and the location area this cell is belonging to is not in the list of forbidden LAs;
- shall if entry into this state was caused by b) or d) with cause "Retry upon entry into a new cell", of subclause 4.7.5.1.5, perform routing area updating when a new cell is entered;
- shall if entry into this state was caused by c) or d) with cause different from "Retry upon entry into a new cell" of subclause 4.7.5.1.5, not perform routing area updating when a new cell is entered; and
- shall use request from CM layers to trigger the combined routing area update procedure, if the network operates in network operation mode I. Depending on which of the timers T3311 or T3302 is running the MS shall stop the relevant timer and act as if the stopped timer has expired.

4.2.5.1.5 Substate, NO-CELL-AVAILABLE

The MS shall perform cell selection/reselection according to 3GPP TS 43.022 [82] and 3GPP TS 25.304 [98].

4.2.5.1.6 Substate, LIMITED-SERVICE

The MS shall perform cell selection/reselection according to 3GPP TS 43.022 [82] and 3GPP TS 25.304 [98];

4.2.5.1.7 Substate, ATTEMPTING-TO-UPDATE-MM

The MS shall:

- perform cell selection/reselection according to 3GPP TS 43.022 [82] and 3GPP TS 25.304 [98];
- receive and transmit user data and signalling information;
- perform routing area update indicating "combined RA/LA updating with IMSI attach" on the expiry of timers T3311 or T3302;
- perform routing area update indicating "combined RA/LA updating with IMSI attach" when the routing area of the serving cell has changed and the location area this cell is belonging to is not in the list of forbidden LAs.

GPRS MSs in operation modes C or A shall answer to paging requests.

GPRS MS in operation mode B may answer to paging requests.

4.2.5.1.8 Substate, PLMN-SEARCH

When the MM state is IDLE, the GMM substate PLMN-SEARCH may be entered if the MS is in automatic network selection mode and the maximum allowed number of subsequently unsuccessful routing area update attempts controlled by the GPRS routing area update attempt counter (clause 4.7.5) have been performed. If a new PLMN is selected the MS shall perform the routing area updating procedure.

*****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;
- 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 3GPP TS 44.018 [84];
 - in GSM, updating the network with the new MS Radio Access Capability IE when the content of the IE has changed. Normal or combined routing area updating procedure is used.;
 - updating the network with the new DRX parameter IE when the content of the IE has changed. Normal or combined routing area updating procedure is used.;
- UMTS to GSM and for GSM to UMTS intersystem change, see subclause 4.7.1.7; or
- in UMTS, to re-synchronize the PMM mode of MS and network after RRC connection release with cause "Directed signalling connection re-establishment", see subclause 4.7.2.5.

The routing area updating procedure shall also be used by a MS which is attached for GPRS services if a new PLMN is entered (see 3GPP TS 23.122 [14]).

Subclause 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 subclause 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 subclause 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 subclause 4.4.1.

The Mobile Equipment shall contain a list of "equivalent PLMNs". The handling of this list is described in subclause 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.

In UMTS, when a ROUTING AREA UPDATE REQUEST is received by the SGSN over a new PS signalling connection while there is an ongoing PS signalling connection (network is already in mode PMM-CONNECTED) for this UE, the network shall progress the routing area update procedure as normal and release the previous PS signalling connection when the routing area update procedure has been accepted by the network.

NOTE: The re-establishment of the radio bearers of active PDP contexts is done as described in subclause "Service Request procedure".

The network informs the MS about the support of specific features, such as LCS-MOLR, in the "Network feature support" Information Element. The information is either explicitly given by sending the "Network feature support" IE or implicitly by not sending it. The handling in the network is described in subclause 9.4.15.11. The MS may use the indication to inform the user about the availability of the appropriate services and it shall not request services that have not been indicated as available.

*****NEXT MODIFICATION*****

4.7.5.1.5 Abnormal cases in the MS

The following abnormal cases can be identified:

- a) Access barred because of access class control

The routing area updating procedure shall not be started. The MS stays in the current serving cell and applies the normal cell reselection process. The procedure is started as soon as possible and if still necessary, i.e. when the barred state is removed or because of a cell change.

- b) Lower layer failure before the ROUTING AREA UPDATE ACCEPT or ROUTING AREA UPDATE REJECT message is received

The procedure shall be aborted. The MS shall proceed as described below.

- c) T3330 time-out

The procedure is restarted four times, i.e. on the fifth expiry of timer T3330, the MS shall abort the procedure. The MS shall proceed as described below.

- d) ROUTING AREA UPDATE REJECT, other causes than those treated in subclause 4.7.5.1.4

The MS shall proceed as described below.

- e) If a routing area border is crossed, when the MS is in state GMM-ROUTING-AREA-UPDATE-INITIATED, the routing area updating procedure shall be aborted and re-initiated immediately. The MS shall set the GPRS update status to GU2 NOT UPDATED.

- f) In GSM, if a cell change occurs within the same RA, when the MS is in state GMM-ROUTING-AREA-UPDATE-INITIATED, the cell update procedure is performed, before completion of the routing area updating procedure.

- g) Routing area updating and detach procedure collision

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

If the MS receives a DETACH REQUEST message before the routing area updating procedure has been completed, the routing area updating procedure shall be aborted and the GPRS detach procedure shall be progressed.

GPRS detach containing detach type "IMSI detach":

If the MS receives a DETACH REQUEST message before the routing area updating procedure has been completed, the routing area updating procedure shall be progressed, i.e. the DETACH REQUEST message shall be ignored.

h) Routing area updating and P-TMSI reallocation procedure collision

If the MS receives a P-TMSI REALLOCATION REQUEST message before the routing area updating procedure has been completed, the P-TMSI reallocation procedure shall be aborted and the routing area updating procedure shall be progressed.

In cases b, c and d the MS shall proceed as follows:

Timer T3330 shall be stopped if still running. The routing area updating attempt counter shall be incremented.

If the routing area updating attempt counter is less than 5, and the stored RAI is equal to the RAI of the current serving cell and the GMM update status is equal to GU1 UPDATED:

- the MS shall keep the GMM update status to GU1 UPDATED and changes state to GMM-REGISTERED.NORMAL-SERVICE. The MS shall start timer T3311. When timer T3311 expires the routing area updating procedure is triggered again.

If the routing area updating attempt counter is less than 5, and the stored RAI is different to the RAI of the current serving cell or the GMM update status is different to GU1 UPDATED:

- the MS shall start timer T3311, shall set the GPRS update status to GU2 NOT UPDATED and changes state to GMM-REGISTERED.ATTEMPTING-TO-UPDATE.

If the routing area updating attempt counter is greater than or equal to 5:

- the MS shall start timer T3302, shall delete the list of equivalent PLMNs, shall set the GPRS update status to GU2 NOT UPDATED and shall change to state GMM-REGISTERED.ATTEMPTING-TO-UPDATE or optionally to GMM-REGISTERED.PLMN-SEARCH(see subclause 4.2.4.1-25.1.8).

In UMTS, in case c the MS shall release the PS signaling connection and in case d the network shall release the PS signaling connection for this MS (see 3GPP TS 25.331 [23c]).

Helsinki, Finland, 29 July – 2 August

CR-Form-v7

CHANGE REQUEST⌘ **24.008 CR 671** ⌘ rev **3** ⌘ Current version: **3.12.0** ⌘For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Correction to service request procedure		
Source:	⌘ Ericsson, Siemens AG, Nokia, Motorola		
Work item code:	⌘ TEI Date: ⌘ 30.07.2002		
Category:	⌘ F Release: ⌘ R99		
	<table border="0"> <tr> <td style="vertical-align: top;"> <p>Use <u>one</u> of the following categories:</p> <p>F (correction)</p> <p>A (corresponds to a correction in an earlier release)</p> <p>B (addition of feature),</p> <p>C (functional modification of feature)</p> <p>D (editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP TR 21.900.</p> </td> <td style="vertical-align: top;"> <p>Use <u>one</u> of the following releases:</p> <p>2 (GSM Phase 2)</p> <p>R96 (Release 1996)</p> <p>R97 (Release 1997)</p> <p>R98 (Release 1998)</p> <p>R99 (Release 1999)</p> <p>Rel-4 (Release 4)</p> <p>Rel-5 (Release 5)</p> <p>Rel-6 (Release 6)</p> </td> </tr> </table>	<p>Use <u>one</u> of the following categories:</p> <p>F (correction)</p> <p>A (corresponds to a correction in an earlier release)</p> <p>B (addition of feature),</p> <p>C (functional modification of feature)</p> <p>D (editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP TR 21.900.</p>	<p>Use <u>one</u> of the following releases:</p> <p>2 (GSM Phase 2)</p> <p>R96 (Release 1996)</p> <p>R97 (Release 1997)</p> <p>R98 (Release 1998)</p> <p>R99 (Release 1999)</p> <p>Rel-4 (Release 4)</p> <p>Rel-5 (Release 5)</p> <p>Rel-6 (Release 6)</p>
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Reason for change:	⌘ TS 23.060 (Stage 2 on GPRS) states that in event of an lu or RAB release, PDP contexts are preserved in the core network (The SGSN and GGSN nodes). The associated RABs can be re-established at later stage. If the PDP contexts are using streaming or conversational traffic classes these are preserved in the core network, but the maximum bit rate is downgraded to 0kbit/s for uplink and downlink. The re-establishment of the associated RABs of those PDP contexts shall be performed after the MS starts the PDP context modification procedure (and upgrade the maximum bit rate to correct value). In addition, TS 23.060 specifies that the deactivation of the preserved PDP contexts using streaming or conversational traffic classes should be performed through the MS Initiated PDP context deactivation procedure. Due to the fact that the value 0 kbit/s for the maximum bit rate for both, uplink and downlink indicates to the SGSN this RAB shall not be re-established and the MS should start MS Initiated PDP Context modification or PDP Context deactivation procedure, the section 4.7.13 in TS 24.008 has to be corrected. At present, 4.7.13 is not fully compliant with Stage 2 requirements stating that RABs for all activated PDP contexts are re-established after completion of the service request procedure (Service type "data"). The section is currently not taking into account that some PDP Contexts of streaming or conversational class may have been preserved and the maximum bit rate for both uplink and downlink have been downgraded to 0 kbit/s. Moreover, that section doesn't reflect the MS State 2 requirement in order to perform MS Initiated PDP Context modification or PDP Context deactivation procedure in event of preserved PDP contexts using streaming or conversational traffic classes.
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Finally, an R99 CR to TS 23.060 –S2-021999– was approved in the SA2#25 meeting in order to clarify and reaffirm the behaviour of the MS and SGSN in case of preserved PDP context with maximum bit rate of 0kbit/s for uplink and downlink.
 The section 4.7.13 section conflicts with TS 23.060. Some additions are also needed in the section 6.1.3.3.
 The current CR brings TS 24.008 into line with TS 23.060.

Summary of change: ⌘ Correction of the service request procedure when it is used to re-establish RABs for PDP contexts activated without RAB assigned.
 The 4.7.13 section has been corrected indicating that upon completion of a service request procedure with service type “data”, the RABs for the activated PDP contexts are re-established except those having maximum bit rate of 0 kbit/s for both, uplink and downlink. In such a case, the MS should start MS Initiated PDP Context modification or PDP Context deactivation in order to re-activate the PDP context and re-establish the RAB, or deactivate the PDP context respectively.
 The section 6.1.3.3 has also been modified to reflect changes mentioned in the reason of change of the current CR.

Consequences if not approved: ⌘ The current specification text does not describe the case of preserved PDP context with 0kbit/s for maximum bit rate for both, uplink and downlink. This results in wrong implementations with incorrect and undesirable effects. Furthermore, this conflicts with requirements on service request and RAB re-establishment stated in 3GPP TS 23.060 (Stage 2 specification). Thus, TS 24.008 cannot be compliant with the stage 2 specification.

Clauses affected: ⌘ 4.7.13; 6.1.3.3; 6.1.3.3.2; 6.1.3.3.3

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

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 mode or may alternatively be the PMM-CONNECTED mode if the MS requires radio access bearer re-establishment. 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 (in PMM-IDLE or PMM CONNECTED) and downlink (only in PMM-IDLE) user data.

For downlink transfer of signalling or user data in PMM-IDLE mode, the trigger is given from the network by the paging request procedure, which is out of scope of the present document.

For pending downlink user data in PMM-CONNECTED mode, the re-establishment of radio access bearers for all active PDP contexts is done without paging.

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 (e.g. for SM or SMS), 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 or PMM-CONNECTED mode, has pending user data to be sent and no radio access bearer is established for the corresponding PDP context. The procedure is initiated by an indication from the lower layers (see 3GPP TS 24.007). In this case, the service type shall be set to "data".
- c) the MS receives a paging request for PS domain from the network in PMM-IDLE mode. In this case, the service type shall be set to "paging response".

After completion of a Service request procedure but before re-establishment of radio access bearer, if the PDP context status information element is included, then the network should deactivate all those PDP contexts locally (without peer to peer signalling between the MS and the network), which are not in SM state PDP-INACTIVE on network side but are indicated by the MS as being in state PDP-INACTIVE.

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 by the network, except for those activated PDP contexts having maximum bit rate value set to 0 kbit/s for both uplink and downlink. The re-establishment of radio access bearers for those PDP contexts is specified in subclause 6.1.3.3.

The selective re-assignment capability is not supported for the simplicity of the function.

***** NEXT MODIFIED SECTION *****

6.1.3.3 PDP context modification procedure

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

The PDP context modification procedure may also be invoked by the MS, in order to upgrade the maximum bit rate and to trigger the re-establishment of the radio access bearer -for an activated PDP context which is preserved in the MS with maximum bit rate values of 0kbit/s for both uplink and downlink (see 3GPP TS 23.060 [74]). If

- the PDP Context Modification request is accepted by the network but the radio access bearer is not established;
or
- the PDP Context Modification request is rejected with cause "insufficient resources" (see subclause 6.1.3.3.3)

then the MS is not required to start a new PDP Context Modification procedure or to start a Service Request procedure in order to trigger the re-establishment of the radio access bearer.

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

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

***** NEXT MODIFIED SECTION *****

6.1.3.3.2 MS initiated PDP Context Modification accepted by the network

In order to initiate the procedure, the MS sends the MODIFY PDP CONTEXT REQUEST message to the network, enters the state PDP-MODIFY-PENDING and starts timer T3381. The message may contain the requested new QoS and/or the TFT and the requested LLC SAPI (used in GSM).

Upon receipt of the MODIFY PDP CONTEXT REQUEST message, the network may reply with the MODIFY PDP CONTEXT ACCEPT message in order to accept the context modification. The reply message may contain the negotiated QoS and the radio priority level based on the new QoS profile and the negotiated LLC SAPI, that shall be used in GSM by the logical link.

Upon receipt of the MODIFY PDP CONTEXT ACCEPT message, the MS shall stop the timer T3381. If the offered QoS parameters received from the network differs from the QoS requested by the MS, the MS shall either accept the negotiated QoS or initiate the PDP context deactivation procedure.

Note: ___ When modification of QoS was requested by the MS, if the network does not accept the MS request, being unable to provide the requested QoS, it should maintain the QoS negotiated as previously negotiated or propose a new QoS. Therefore, the network would not reject the MS initiated PDP context modification request due to the unavailability of the required QoS.

***** NEXT MODIFIED SECTION *****

6.1.3.3.3 MS initiated PDP Context Modification not accepted by the network

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

- # 26: insufficient resources;
- # 32: Service option not supported;
- # 41: semantic error in the TFT operation;
- # 42: syntactical error in the TFT operation;
- # 44: semantic errors in packet filter(s);
- # 45: syntactical errors in packet filter(s);
- # 95 - 111: protocol errors.

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

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

- a) Semantic errors in TFT operations:
 - I. *TFT operation* = "Create a new TFT" when there is already an existing TFT for the PDP context.
 - II. When the *TFT operation* is an operation other than "Create a new TFT" and there is no TFT for the PDP context.
 - III. *TFT operation* = "Delete existing TFT" when there is already another PDP context without a TFT.
 - IV. *TFT operation* = "Delete packet filters from existing TFT" when it would render the TFT empty.

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

- b) Syntactical errors in TFT operations:
 - I. When the *TFT operation* is an operation other than "Delete existing TFT" and the packet filter list in the TFT IE is empty.
 - II. *TFT operation* = "Delete existing TFT" with a non-empty packet filter list in the TFT IE.
 - III. *TFT operation* = "Replace packet filters in existing TFT" when a to be replaced packet filter does not exist in the original TFT.
 - IV. *TFT operation* = "Delete packet filters from existing TFT" when a to be deleted packet filter does not exist in the original TFT.
 - V. *TFT operation* = "Delete packet filters from existing TFT" with a packet filter list including packet filters instead of packet filter identifiers.
 - VI. When there are other types of syntactical errors in the coding of the TFT IE, such as a mismatch between the number of packet filters subfield, and the number of packet filters in the packet filter list.

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

- c) Semantic errors in packet filters:

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

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

d) Syntactical errors in packet filters:

- I. When the *TFT operation* = "Create a new TFT" or "Add packet filters to existing TFT" and two or more packet filters in the resultant TFT would have identical packet filter identifiers.
- II. When the *TFT operation* = "Create a new TFT" or "Add packet filters to existing TFT" or "Replace packet filters in existing TFT" and two or more packet filters in all TFTs associated with this PDP address would have identical packet filter precedence values.
- III. When there are other types of syntactical errors in the coding of packet filters, such as the use of a reserved value for a packet filter component identifier.

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

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

Helsinki, Finland, 29 July – 2 August

CR-Form-v7

CHANGE REQUEST

⌘ **24.008 CR 672** ⌘ rev **3** ⌘ Current version: **4.7.0** ⌘

For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.

Proposed change affects: UICC apps ⌘ ME Radio Access Network Core Network

Title:	⌘ Correction to service request procedure		
Source:	⌘ Ericsson, Siemens AG, Nokia, Motorola		
Work item code:	⌘ TEI	Date:	⌘ 01.08.2002
Category:	⌘ A Use <u>one</u> of the following categories: F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.	Release:	⌘ Rel-4 Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) Rel-4 (Release 4) Rel-5 (Release 5) Rel-6 (Release 6)

Reason for change: ⌘ TS 23.060 (Stage 2 on GPRS) states that in event of an lu or RAB release, PDP contexts are preserved in the core network (The SGSN and GGSN nodes). The associated RABs can be re-established at later stage.
 If the PDP contexts are using streaming or conversational traffic classes these are preserved in the core network, but the maximum bit rate is downgraded to 0kbit/s for uplink and downlink. The re-establishment of the associated RABs of those PDP contexts shall be performed after the MS starts the PDP context modification procedure (and upgrade the maximum bit rate to correct value).
 In addition, TS 23.060 specifies that the deactivation of the preserved PDP contexts using streaming or conversational traffic classes should be performed through the MS Initiated PDP context deactivation procedure.

Due to the fact that the value 0 kbit/s for the maximum bit rate for both, uplink and downlink indicates to the SGSN this RAB shall not be re-established and the MS should start MS Initiated PDP Context modification or PDP Context deactivation procedure, the section 4.7.13 in TS 24.008 has to be corrected. At present, 4.7.13 is not fully compliant with Stage 2 requirements stating that RABs for all activated PDP contexts are re-established after completion of the service request procedure (Service type "data"). The section is currently not taking into account that some PDP Contexts of streaming or conversational class may have been preserved and the maximum bit rate for both uplink and downlink have been downgraded to 0 kbit/s.
 Moreover, that section doesn't reflect the MS State 2 requirement in order to perform MS Initiated PDP Context modification or PDP Context deactivation procedure in event of preserved PDP contexts using streaming or conversational traffic classes.

Finally, an R99 CR to TS 23.060 –S2-021999– was approved in the SA2#25 meeting in order to clarify and reaffirm the behaviour of the MS and SGSN in case of preserved PDP context with maximum bit rate of 0kbit/s for uplink and downlink.
 The section 4.7.13 section conflicts with TS 23.060. Some additions are also needed in the section 6.1.3.3.
 The current CR brings TS 24.008 into line with TS 23.060.

Summary of change: ⌘ Correction of the service request procedure when it is used to re-establish RABs for PDP contexts activated without RAB assigned.
 The 4.7.13 section has been corrected indicating that upon completion of a service request procedure with service type “data”, the RABs for the activated PDP contexts are re-established except those having maximum bit rate of 0 kbit/s for both, uplink and downlink. In such a case, the MS should start MS Initiated PDP Context modification or PDP Context deactivation in order to re-activate the PDP context and re-establish the RAB, or deactivate the PDP context respectively.
 The section 6.1.3.3 has also been modified to reflect changes mentioned in the reason of change of the current CR.

Consequences if not approved: ⌘ The current specification text does not describe the case of preserved PDP context with 0kbit/s for maximum bit rate for both, uplink and downlink. This results in wrong implementations with incorrect and undesirable effects. Furthermore, this conflicts with requirements on service request and RAB re-establishment stated in 3GPP TS 23.060 (Stage 2 specification). Thus, TS 24.008 cannot be compliant with the stage 2 specification.

Clauses affected: ⌘ 4.7.13; 6.1.3.3; 6.1.3.3.2; 6.1.3.3.3

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

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 mode or may alternatively be the PMM-CONNECTED mode if the MS requires radio access bearer re-establishment. 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 (in PMM-IDLE or PMM CONNECTED) and downlink (only in PMM-IDLE) user data.

For downlink transfer of signalling or user data in PMM-IDLE mode, the trigger is given from the network by the paging request procedure, which is out of scope of the present document.

For pending downlink user data in PMM-CONNECTED mode, the re-establishment of radio access bearers for all active PDP contexts is done without paging.

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 (e.g. for SM or SMS), 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 or PMM-CONNECTED mode, has pending user data to be sent and no radio access bearer is established for the corresponding PDP context. The procedure is initiated by an indication from the lower layers (see 3GPP TS 24.007 [20]). 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 but before re-establishment of radio access bearer, if the PDP context status information element is included, then the network shall deactivate all those PDP contexts locally (without peer to peer signalling between the MS and the network), which are not in SM state PDP-INACTIVE on network side but are indicated by the MS as being in state PDP-INACTIVE.

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 by the network, except for those activated PDP contexts having maximum bit rate value set to 0 kbit/s for both uplink and downlink. The re-establishment of radio access bearers for those PDP contexts is specified in subclause 6.1.3.3.

The selective re-assignment capability is not supported for the simplicity of the function.

***** NEXT MODIFIED SECTION *****

6.1.3.3 PDP context modification procedure

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

The PDP context modification procedure may also be invoked by the MS, in order to upgrade the maximum bit rate and to trigger the re-establishment of the radio access bearer for an activated PDP context which is preserved in the MS with maximum bit rate values of 0kbit/s for both uplink and downlink (see 3GPP TS 23.060 [74]). If

- the PDP Context Modification request is accepted by the network but the radio access bearer is not established;
or
- the PDP Context Modification request is rejected with cause "insufficient resources" (see subclause 6.1.3.3.3)

then the MS is not required to start a new PDP Context Modification procedure or to start a Service Request procedure in order to trigger the re-establishment of the radio access bearer.

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

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

***** NEXT MODIFIED SECTION *****

6.1.3.3.2 MS initiated PDP Context Modification accepted by the network

In order to initiate the procedure, the MS sends the MODIFY PDP CONTEXT REQUEST message to the network, enters the state PDP-MODIFY-PENDING and starts timer T3381. The message may contain the requested new QoS and/or the TFT and the requested LLC SAPI (used in GSM).

Upon receipt of the MODIFY PDP CONTEXT REQUEST message, the network may reply with the MODIFY PDP CONTEXT ACCEPT message in order to accept the context modification. The reply message may contain the negotiated QoS and the radio priority level based on the new QoS profile and the negotiated LLC SAPI, that shall be used in GSM by the logical link.

Upon receipt of the MODIFY PDP CONTEXT ACCEPT message, the MS shall stop the timer T3381. If the offered QoS parameters received from the network differs from the QoS requested by the MS, the MS shall either accept the negotiated QoS or initiate the PDP context deactivation procedure.

Note: ___ When modification of QoS was requested by the MS, if the network does not accept the MS request, being unable to provide the requested QoS, it should maintain the QoS negotiated as previously negotiated or propose a new QoS. Therefore, the network would not reject the MS initiated PDP context modification request due to the unavailability of the required QoS.

***** NEXT MODIFIED SECTION *****

6.1.3.3.3 MS initiated PDP Context Modification not accepted by the network

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

- # 26: insufficient resources;
- # 32: Service option not supported;
- # 41: semantic error in the TFT operation;
- # 42: syntactical error in the TFT operation;
- # 44: semantic errors in packet filter(s);
- # 45: syntactical errors in packet filter(s);
- # 95 - 111: protocol errors.

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

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

- a) Semantic errors in TFT operations:
 - I. *TFT operation* = "Create a new TFT" when there is already an existing TFT for the PDP context.
 - II. When the *TFT operation* is an operation other than "Create a new TFT" and there is no TFT for the PDP context.
 - III. *TFT operation* = "Delete existing TFT" when there is already another PDP context without a TFT.
 - IV. *TFT operation* = "Delete packet filters from existing TFT" when it would render the TFT empty.

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

- b) Syntactical errors in TFT operations:
 - I. When the *TFT operation* is an operation other than "Delete existing TFT" and the packet filter list in the TFT IE is empty.
 - II. *TFT operation* = "Delete existing TFT" with a non-empty packet filter list in the TFT IE.
 - III. *TFT operation* = "Replace packet filters in existing TFT" when a to be replaced packet filter does not exist in the original TFT.
 - IV. *TFT operation* = "Delete packet filters from existing TFT" when a to be deleted packet filter does not exist in the original TFT.
 - V. *TFT operation* = "Delete packet filters from existing TFT" with a packet filter list including packet filters instead of packet filter identifiers.
 - VI. When there are other types of syntactical errors in the coding of the TFT IE, such as a mismatch between the number of packet filters subfield, and the number of packet filters in the packet filter list.

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

- c) Semantic errors in packet filters:

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

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

d) Syntactical errors in packet filters:

- I. When the *TFT operation* = "Create a new TFT" or "Add packet filters to existing TFT" and two or more packet filters in the resultant TFT would have identical packet filter identifiers.
- II. When the *TFT operation* = "Create a new TFT" or "Add packet filters to existing TFT" or "Replace packet filters in existing TFT" and two or more packet filters in all TFTs associated with this PDP address would have identical packet filter precedence values.
- III. When there are other types of syntactical errors in the coding of packet filters, such as the use of a reserved value for a packet filter component identifier.

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

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

Helsinki, Finland, 29 July – 2 August

CR-Form-v7

CHANGE REQUEST

⌘ **24.008 CR 673** ⌘ rev **3** ⌘ Current version: **5.4.0** ⌘

For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.

Proposed change affects: UICC apps ⌘ ME Radio Access Network Core Network

Title:	⌘ Correction to service request procedure
Source:	⌘ Ericsson, Siemens AG, Nokia, Motorola
Work item code:	⌘ TEI Date: ⌘ 01.08.2002
Category:	⌘ A Release: ⌘ Rel-5
<p>Use <u>one</u> of the following categories:</p> <p>F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP TR 21.900.</p>	
<p>Use <u>one</u> of the following releases:</p> <p>2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) Rel-4 (Release 4) Rel-5 (Release 5) Rel-6 (Release 6)</p>	

Reason for change: ⌘ TS 23.060 (Stage 2 on GPRS) states that in event of an lu or RAB release, PDP contexts are preserved in the core network (The SGSN and GGSN nodes). The associated RABs can be re-established at later stage.
If the PDP contexts are using streaming or conversational traffic classes these are preserved in the core network, but the maximum bit rate is downgraded to 0kbit/s for uplink and downlink. The re-establishment of the associated RABs of those PDP contexts shall be performed after the MS starts the PDP context modification procedure (and upgrade the maximum bit rate to correct value).
In addition, TS 23.060 specifies that the deactivation of the preserved PDP contexts using streaming or conversational traffic classes should be performed through the MS Initiated PDP context deactivation procedure.

Due to the fact that the value 0 kbit/s for the maximum bit rate for both, uplink and downlink indicates to the SGSN this RAB shall not be re-established and the MS should start MS Initiated PDP Context modification or PDP Context deactivation procedure, the section 4.7.13 in TS 24.008 has to be corrected. At present, 4.7.13 is not fully compliant with Stage 2 requirements stating that RABs for all activated PDP contexts are re-established after completion of the service request procedure (Service type "data"). The section is currently not taking into account that some PDP Contexts of streaming or conversational class may have been preserved and the maximum bit rate for both uplink and downlink have been downgraded to 0 kbit/s.
Moreover, that section doesn't reflect the MS State 2 requirement in order to perform MS Initiated PDP Context modification or PDP Context deactivation procedure in event of preserved PDP contexts using streaming or conversational traffic classes.

Finally, an R99 CR to TS 23.060 –S2-021999– was approved in the SA2#25 meeting in order to clarify and reaffirm the behaviour of the MS and SGSN in case of preserved PDP context with maximum bit rate of 0kbit/s for uplink and downlink.
 The section 4.7.13 section conflicts with TS 23.060. Some additions are also needed in the section 6.1.3.3.
 The current CR brings TS 24.008 into line with TS 23.060.

Summary of change: ⌘ Correction of the service request procedure when it is used to re-establish RABs for PDP contexts activated without RAB assigned.
 The 4.7.13 section has been corrected indicating that upon completion of a service request procedure with service type “data”, the RABs for the activated PDP contexts are re-established except those having maximum bit rate of 0 kbit/s for both, uplink and downlink. In such a case, the MS should start MS Initiated PDP Context modification or PDP Context deactivation in order to re-activate the PDP context and re-establish the RAB, or deactivate the PDP context respectively.
 The section 6.1.3.3 has also been modified to reflect changes mentioned in the reason of change of the current CR.

Consequences if not approved: ⌘ The current specification text does not describe the case of preserved PDP context with 0kbit/s for maximum bit rate for both, uplink and downlink. This results in wrong implementations with incorrect and undesirable effects. Furthermore, this conflicts with requirements on service request and RAB re-establishment stated in 3GPP TS 23.060 (Stage 2 specification). Thus, TS 24.008 cannot be compliant with the stage 2 specification.

Clauses affected: ⌘ 4.7.13; 6.1.3.3; 6.1.3.3.3

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

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 mode or may alternatively be the PMM-CONNECTED mode if the MS requires radio access bearer re-establishment. 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 (in PMM-IDLE or PMM CONNECTED) and downlink (only in PMM-IDLE) user data.

For downlink transfer of signalling or user data in PMM-IDLE mode, the trigger is given from the network by the paging request procedure, which is out of scope of the present document.

For pending downlink user data in PMM-CONNECTED mode, the re-establishment of radio access bearers for all active PDP contexts is done without paging.

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 (e.g. for SM or SMS), 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 or PMM-CONNECTED mode, has pending user data to be sent and no radio access bearer is established for the corresponding PDP context. The procedure is initiated by an indication from the lower layers (see 3GPP TS 24.007 [20]). 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 but before re-establishment of radio access bearer, if the PDP context status information element is included, then the network shall deactivate all those PDP contexts locally (without peer to peer signalling between the MS and the network), which are not in SM state PDP-INACTIVE on network side but are indicated by the MS as being in state PDP-INACTIVE.

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 by the network, except for those activated PDP contexts having maximum bit rate value set to 0 kbit/s for both uplink and downlink. The re-establishment of radio access bearers for those PDP contexts is specified in subclause 6.1.3.3.

The selective re-assignment capability is not supported for the simplicity of the function.

***** NEXT MODIFIED SECTION *****

6.1.3.3 PDP context modification procedure

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

The PDP context modification procedure may also be invoked by the MS, in order to upgrade the maximum bit rate and to trigger the re-establishment of the radio access bearer for an activated PDP context which is preserved in the MS with maximum bit rate values of 0kbit/s for both uplink and downlink (see 3GPP TS 23.060 [74]). If

- the PDP Context Modification request is accepted by the network but the radio access bearer is not established;
or
- the PDP Context Modification request is rejected with cause "insufficient resources" (see subclause 6.1.3.3.3)

then the MS is not required to start a new PDP Context Modification procedure or to start a Service Request procedure in order to trigger the re-establishment of the radio access bearer.

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

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

***** NEXT MODIFIED SECTION *****

6.1.3.3.3 MS initiated PDP Context Modification not accepted by the network

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

- # 26: insufficient resources;
- # 32: Service option not supported;
- # 41: semantic error in the TFT operation;
- # 42: syntactical error in the TFT operation;
- # 44: semantic errors in packet filter(s);
- # 45: syntactical errors in packet filter(s);
- # 95 - 111: protocol errors.

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

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

- a) Semantic errors in TFT operations:
 - I. *TFT operation* = "Create a new TFT" when there is already an existing TFT for the PDP context.
 - II. When the *TFT operation* is an operation other than "Create a new TFT" and there is no TFT for the PDP context.
 - III. *TFT operation* = "Delete existing TFT" when there is already another PDP context without a TFT.
 - IV. *TFT operation* = "Delete packet filters from existing TFT" when it would render the TFT empty.

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

- b) Syntactical errors in TFT operations:
 - I. When the *TFT operation* is an operation other than "Delete existing TFT" and the packet filter list in the TFT IE is empty.
 - II. *TFT operation* = "Delete existing TFT" with a non-empty packet filter list in the TFT IE.
 - III. *TFT operation* = "Replace packet filters in existing TFT" when a to be replaced packet filter does not exist in the original TFT.
 - IV. *TFT operation* = "Delete packet filters from existing TFT" when a to be deleted packet filter does not exist in the original TFT.
 - V. *TFT operation* = "Delete packet filters from existing TFT" with a packet filter list including packet filters instead of packet filter identifiers.
 - VI. When there are other types of syntactical errors in the coding of the TFT IE, such as a mismatch between the number of packet filters subfield, and the number of packet filters in the packet filter list.

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

- c) Semantic errors in packet filters:

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

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

d) Syntactical errors in packet filters:

- I. When the *TFT operation* = "Create a new TFT" or "Add packet filters to existing TFT" and two or more packet filters in the resultant TFT would have identical packet filter identifiers.
- II. When the *TFT operation* = "Create a new TFT" or "Add packet filters to existing TFT" or "Replace packet filters in existing TFT" and two or more packet filters in all TFTs associated with this PDP address would have identical packet filter precedence values.
- III. When there are other types of syntactical errors in the coding of packet filters, such as the use of a reserved value for a packet filter component identifier.

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

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